Universal Design for Learning: Implications for RTLB

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ABSTRACT

Universal Design for Learning (UDL) is a framework for developing inclusive educational practices. The primary purpose of this small-scale professional inquiry was to investigate the effective ways in which Resource Teachers: Learning and Behaviour (RTLB) across New Zealand implement and evaluate the UDL framework in their practice to improve the educational achievement of all learners. The enablers and barriers to implementing UDL in practice were explored through an anonymous online questionnaire using a mixed-method approach. This study highlighted that RTLB were using the UDL principles in several areas at different stages of the RTLB practice sequence. The results indicated that ongoing professional learning development and collaboration within the organisation were the preferred modes of support to implement the UDL framework. RTLB also articulated several barriers to its implementation including teacher resistance and lack of knowledge. The need for more UDL training for educators was identified. Differences were found in ways of monitoring the UDL interventions amongst practitioners. The results further underlined the need for developing a clear criterion to monitor the application of UDL in practice.

Research Paper

Keywords:
collaboration, inclusion, Professional learning and development (PLD), RTLB, universal design for learning (UDL)

BACKGROUND AND RATIONALE

The dynamic of mainstream classrooms has changed considerably in the past two decades with the inclusion of students with unique sets of skills and abilities. To address this learner variability, teachers are challenged to adjust their learning environments to provide access to learning for each student. A foundation principle of the New Zealand Curriculum[1] (NZC) is *inclusion*, to ensure that everyone has access to learning in a way that works for them (Ministry of Education [MOE], 2006). To support inclusion, the Special Education Policy was announced in 1996 with an emphasis on teacher training to meet the needs of all students in a regular classroom, resulting in the formation of the Resource Teachers: Learning and Behaviour (RTLB) role (Thomson et al., 1999). RTLB are fully registered specialist itinerant teachers who work with teachers and schools to support the achievement of students in Years 1-10 with learning and/or behaviour difficulties to promote inclusive practices (MOE, 2018).

RTLB support teachers in identifying evidence-informed strategies to break down barriers to inclusion in the least intrusive way. To achieve the goal of inclusion, universal design for learning (UDL) provides a translational framework for general education and special education teachers, such as RTLB, to create a flexible learning environment by removing barriers and increasing accessibility for *all* learners (Te Kete Ipurangi, n.d.). The core principle of UDL is the understanding that what is necessary for *some* is almost always good for *all* (Meyer et al., 2014).

When educators use the UDL framework to intentionally and proactively design learning, the possibility of full inclusion increases (Hall et al., 2015). UDL has been recommended in *He Pikorua Framework*[2] as a, "research-based framework that education settings can use to design more flexible inclusive learning environments, where everyone is learning and achieving and diversity is seen as a source of strength" (MOE, 2019, p. 32).

[1] NZ curriculum is a guiding document that provides guidance and direction to schools and educators to design the curriculum (MOE, 2006).

[2] He Pikorua is a newly developed *Practice Framework* for all practitioners working across learning support including MOE personnel and RTLB to support the learning and well-being of students by bringing a range of background knowledge, experience, skills, and professional expertise together.

Recently, several RTLB clusters[3] across New Zealand have started using the UDL framework in their practice. Our cluster had started exploring this framework through a full-day professional learning development (PLD) in 2018, followed by yearly workshops in 2019 and 2020. Despite these PLD, it was noticed that very few RTLB had started implementing the UDL strategies in their practice. There may be several reasons leading to this issue: for instance, RTLB have not been given sufficient time to explore the UDL strategies, and possibly the leadership team has not been offering ongoing assistance after the PLD as one-off PLD has been identified to impede the implementation and sustainability of any framework with fidelity (Bickerstaff & Cormier, 2015; Darling-Hammond et al., 2017; Stes et al., 2010).

To support the UDL implementation in our cluster, the strategic goals were set under the UDL umbrella this year. My practice leader (PL) role in the cluster involves supporting reflective practices and initiating project work aligned with the cluster's strategic goals (MOE, 2018) such as UDL. Hence, I had started exploring the best possible strategies to support RTLB in UDL implementation. To date, very little research exists in New Zealand that has studied the implementation of UDL in NZ schools and/or in RTLB clusters. The purpose of this project is to identify the best possible support to offer to RTLB so that they can implement the UDL framework in their practice confidently, leading to raising the achievements of all learners.

LITERATURE REVIEW

UDL is a research-based theoretical framework (Meyer et al., 2014) to promote inclusive practices in schools that, "addresses the natural variability of learners by increasing flexibility and reducing barriers in instruction" (Coyne et al., 2017, p. 4). Usually, the curriculum is designed for an imaginary average learner (Hartmann, 2015) although there is no such thing as 'average'. Instead, learning is a unique experience for all learners with different stimuli (Hall et al., 2012). Learner variability is a norm in today's classrooms (Hartmann, 2015) which should be accepted, embraced and creatively encouraged. UDL addresses this variability by providing guidelines to proactively build flexibility, choice and engagement for all learners (Cook & Rao, 2018).

The idea of universal design (UD) stems from the field of architecture (Hall et al., 2012). Curb cuts, captioning in movies and ramps are some examples of UD. The concrete idea of construction to ensure accessibility was generalised to the abstract idea of teaching and learning (Ok et al., 2017), coined as UDL in the United States of America (USA). In 1984, David Rose and Ann Meyer co-founded the Center for Applied Special Technology (CAST) and began to extend the principles of UD to the learning environment.

Based on two decades of research from neuroscience into the nature of learning differences, the UDL framework presents a set of guidelines, developed by CAST in April 2008, to apply for the design and implementation of curriculum and instruction. The UDL principles map onto three groups of brain networks that play a major role in learning: recognition *('what')*, strategic *('how')*, and affective *('why')* of the learning (Hall et al., 2012). These three networks provide the basis for the UDL principles: *multiple means of engagement, multiple means of representation*, and *multiple means of action and expression.* These principles are further expanded into nine guidelines each with multiple checkpoints offering specific approaches to the UDL implementation (Meyer et al., 2014). CAST (2018) has provided a visual graphic organiser (see Figure 1) to illustrate these principles, guidelines and checkpoints that are organised from the most general (principle) to the most specific (checkpoints), and from the simplest cognitive options to the most complex (Capp, 2017).

Hartmann (2015) argues that every learner is resourceful and knowledgeable, strategic and goal-directed, and purposeful and motivated, hence all learners can become 'expert learners' if we provide them meaningful learning experiences using these principles. Multiple means of engagement encourage teachers to identify ways to increase students' interest, motivation, and persistence by providing authentic and meaningful learning tasks and offering choice. Multiple means of presentation give educators several ways to present the information to students based on their learning styles, experiences and background knowledge to make the content accessible to them. Multiple means of action and representation offer students alternative communication means and provide teachers with numerous methods to assess students. After examining the possible barriers, teachers use

[3] A cluster is a group of RTLB employed by a lead school and its board serving a set geographical area. There are 40 RTLB clusters across NZ. Cluster Nine covers Mangere/Otahuhu area in Auckland employing 27 RTLB and serving 29 schools.

Figure 1. Principles, guidelines, and checkpoints of UDL.

these three principles to incorporate appropriate challenging instructional goals - diverse methods, flexible materials and ongoing assessments in their teaching (Hitchcock et al., 2016; Rao & Torres, 2017). This process reduces frustration amongst teachers and students, motivates students to participate and increases the acceptance of all students (Lieberman et al., 2008).

Theory to Practice

The empirical literature on UDL addresses many contexts of educational practice. Researchers and educators, including resource teachers, have applied the UDL principles to a range of purposes including learning processes, assessments, transitions, professional development and classroom practices, and noted significant gains in student outcomes (Rao et al., 2014).

Academic Skills

There is an instinctive appeal that when educators use different ways to engage students, present content using multiple media and provide them various opportunities to express their knowledge, their achievement improves. In several experimental and single-case studies, researchers observed gains in students' academic outcomes using the UD-based interventions in academic areas such as literacy

and mathematics (Browder et al., 2008; Coyne et al., 2012; Hall et al., 2015; Root et al., 2019). An experimental study conducted in four middle schools in the USA showed strong evidence of improved comprehension scores for students when provided multiple ways to access literacy support (Hall et al., 2015). Another multiple-probe, single-subject design in a special education junior classroom study noted increased independent responses for literacy with the use of UDL principles (Browder et al., 2008).

Student Perceptions, Behaviour, Engagement, and Social Skills

Numerous studies examined the effect of UDL principles on students' perceptions about school and reported increased student engagement and improved social skills (Dymond et al., 2006; Katz & Sokal, 2016). High rates of engagement and improved perceptions of the school were noted in primary (Glass, 2013), middle (Coyne et al., 2017), and high school students (Katz & Sugden, 2013; Kortering et al., 2008) with UDL-based activities such as providing age-relevant text and individual choice and autonomy. Furthermore, Spencer (2011) has proposed the key benefits of UDL as reduced behaviour problems, increased metacognitive knowledge, and improved access to the curriculum in struggling students.

Teacher Efficacy

Buy-in from educators to make changes in their practice is an essential element to foster any project (van Kraayenoord et al., 2014). Several studies have been conducted to determine UDLs potential in changing teachers' perceptions and efficacy including resource teachers. A study involving 58 educators, including resource teachers in ten schools in Canada, conceded that use of the UDL concept improved their self-efficacy, reduced their workload, and improved their job satisfaction which was reflected in their willingness to change their instructional practices (Katz, 2015). Likewise, Rappolt-Schlichtmann et al. (2013) (a conducted a randomised controlled trial in eight schools to explore teachers' experiences and perceptions of the usefulness of UDL to learning and concluded that UDL resulted in increased feelings of competence and autonomy amongst teachers including specialist teachers such as RTLB.

Implications for RTLB

All RTLB principles[4] (MOE, 2019) can be employed within the UDL framework. For instance, the UDL framework works on a strengths-based and student-centred approach (Kieran & Anderson, 2019) to support the needs of all learners, including those with disabilities and from culturally and linguistically diverse backgrounds (Katz, 2015). UDL is an ecological model that takes a *people-first* approach by thinking about learners and their experiences before thinking about *what* to teach (Te Kete Ipurangi, n.d.). Chita-Tegmark et al. (2012) proposed using the UDL approach for creating a culturally-affirming curriculum to improve the education of all learners. For example, the principle of *multiple means of action and expression* provides students with opportunities to share their family histories, examples from students' culture can be used to provide *multiple means of engagement*, and *multiple means of representation* may comprise of using culturally-responsive approaches such as *tuakana teina* where the roles of tutor and tutee are interchangeable. Another guiding principle of the RTLB practice is collaboration, which is about working with all stakeholders and whānau[5] to plan effective interventions for students. Wu (2010) classified UDL as a collaborative framework that encourages educators to work with parents and other professionals to ensure meaningful learning experiences for students.

Furthermore, Ok et al. (2017) underscored the importance of collaboration amongst stakeholders such as special educators, general education teachers and school administrators to integrate the UDL framework into planning. Wu (2010) also suggested using UDL implementation as a collective approach starting with all practitioners in the institution sharing their perceptions, beliefs and existing practices to reach a common understanding of UDL principles. The importance of a professional support network is also underlined in the research for successful UDL implementation (Lowrey et al., 2017).

Teachers' knowledge and confidence is the primary prerequisite of the implementation of UDL (Edyburn, 2010). RTLB need support within the cluster to create an environment for UDL to thrive (Scott, 2018). The onus is on the leaders to ensure that educators have the required skills and support to implement UDL (Fixsen et al., 2009). A study in Australia (Capp, 2020) found that teachers lacked knowledge,

[4] RTLB adhere to these seven principles- Mokopuna & whānau-centred, collaborative, strengths-based, culturally affirming, inclusive, ecological, evidence-informed (Ministry of Education, 2019)

[5] An extended family who live together at the same place.

confidence and understanding of the UDL framework. However, the good news is that there is a positive correlation between effective PLD and implementation of UDL as educators develop skills to design learning environments to suit learners' variability (Craig et al., 2019). Given the complex nature of UDL, it is very unlikely that educators can implement it effectively if the PLD provided is not ongoing and comprehensive (Edyburn, 2010). One-off PLD can be used as a primer to spark the interest of educators but it must be accompanied by a series of workshops throughout the year to sustain interest and gains (Hromalik et al., 2020). Capp (2020) asserts that educators' level of confidence in implementing UDL varies, hence PLD should be collaborative and collegial, must include hands-on practical activities along with the modelling of effective practices, and should have an element of ongoing support (Darling-Hammond et al., 2017).

Any attempted implementation of a programme reveals barriers that need to be addressed. Implementation of UDL in education is no different. Certain characteristics of educators such as resistance to learn and intervene are difficult to mitigate, posing a major barrier in the implementation of a programme (Fixsen et al., 2009). This reluctance may be due to the lack of confidence amongst educators. Scott (2018) states that implementing UDL may be daunting and overwhelming for teachers if a more scaffolded approach for implementation according to a teacher's foundational knowledge, expertise and experience is not introduced. Training and ongoing support are the primary ways to remove the barrier of teacher resistance and to achieve behavioural change for the implementation and sustainability of evidence-based practices (Fixsen et al., 2009).

Another hurdle is the inconsistent and varied ways of implementing UDL principles in interventions due to the lack of standards for reporting and monitoring UDL, resulting in posing a challenge for analysing its effectiveness (Rao et al., 2014). Many studies have emphasised the importance of developing a tool to evaluate the UDL interventions (Smith et al., 2019). UDL is a multifaceted framework for designing learning environments, hence measuring the implementation of UDL continues to present issues for researchers and practitioners. Basham et al. (2020) have developed a semi-structured dynamic observation measurement tool (OMT) with 42-items to measure the level of UDL alignment with the educational practice. The UDL-OMT can be used as a tool for observing a whole-class UDL implementation or with a targeted group of students. It could be suggested here that RTLB also need to use this tool or similar to align the principles, guidelines and checkpoints used in the intervention to better evaluate the effects of UDL-based interventions on student outcomes (Rao et al., 2014).

An additional barrier in the UDL application is the time factor. Edyburn (2010) acknowledges that it may take up to ten years for the *advocacy* phase of the A3 Model[6] to raise awareness about UDL and to highlight the need for system change. As UDL is a comprehensive framework with various pathways to choose from, educators need to establish a realistic timeline for integrating UDL into interventions (Canter et al., 2017; Ok et al., 2017).

There are several gaps in the current UDL literature. Most of the empirical research has been conducted in the USA and Canada only, though some theoretical work in other countries has been conducted. This includes a UDL review in Brazil (Oliveira et al., 2019), assessing teachers' knowledge to implement UDL in South Arabia (Alquraini & Rao, 2020), and measuring teachers' confidence in applying UDL principles in Australia (Capp, 2020). Another major gap is that very limited studies (Scott, 2018) have offered insight from educators to identify enablers and barriers to implement UDL. Furthermore, there is a scarcity of empirical research exploring the effectiveness of UDL especially on student outcomes (Rao et al., 2014). Most of the research is qualitative and is perceived effective but did not examine whether UD-based interventions resulted in improved learning outcomes in terms of subject matter and skills acquisition. There was no standard format for reporting links between UDL principles and their application to elements of interventions in research. Hence, Rao et al., (2020) developed and trialled a set of guidelines for researchers and educators for consistent standardised reporting of the UDL implementation. They used this newly developed *UDL reporting criteria*[7] against the current literature and found that the categories of *learner variability* and *instruction design* are often sufficiently addressed in the present literature, whereas information on *UDL application and UDL-related outcomes* are not as consistently reported. Although UDL has been a major focus

[6] A3 Model has three phases for implementing UDL 1. Advocacy phase to raise awareness and to highlight the need for system change to meet the needs of all students, 2. Accommodations phase for modified instruction, upon request, need extra time, and effort 3. Accessibility phase when equitability is provided to everyone at the same time without any extra efforts.

[7] UDL reporting criteria has three categories: Learner variability and environment, Proactive and intentional design, and Implementation and outcomes.

to promote inclusion in NZ schools, the action and empirical research in this area is non-existent. Therefore, there is a need for action research in UDL where researchers should collaborate with educators to uncover the realities of applying UDL in practice (Smith et al., 2019).

Inquiry Questions

How are RTLB clusters using the UDL framework in their practice across New Zealand?

How can I support our cluster RTLB with the identified strategies to use the UDL framework so they can embed it in their practice?

METHODOLOGY

The convergent parallel mixed-method design was used in this inquiry project where both qualitative and quantitative data were collected concurrently and interpreted independently (Creswell & Clark, 2018). The purpose of the convergent design was to collect complementary data to develop a full understanding of the phenomenon. The results were then merged during the overall interpretation to identify the themes to support RTLB to use UDL in their practice. This mixed-method approach was useful to understand various viewpoints and to get a clearer understanding of the topic (Denscombe, 2014).

The context of the inquiry was the RTLB clusters who have been using the UDL framework as a focus in their practice. A non-probability purposive sampling[8] technique (Mutch, 2013) was used to select 12 clusters that use the UDL framework in their practice. The rationale for using this method was to collect the information fairly and transparently only from specific UDL-focused clusters.

The research was undertaken using an anonymous online Google Form (questionnaire) sent by the RTLB cluster manager to the above 12 cluster managers who forwarded the questionnaire to their RTLB. A questionnaire provides a snapshot of information about the current situation (Denscombe, 2014) and is useful to encompass a breadth of view from large groups in a specific area (Cohen et al., 2017; Denscombe, 2014; Mutch, 2013). Also, an online questionnaire is an easy, reliable and the most widely-used method by researchers (Cohen et al., 2017). Hence, this delivery method was chosen to ensure sufficient responses and to capture data across eight clusters in a short time. However, an identified concern with the use of questionnaires is the loss of participants' voices (Cohen et al., 2017) which was mitigated by using open-ended questions to get the qualitative data. Another perceived limitation is a lack of responses. To avoid this, the questionnaire was kept short and concise, and a reminder was sent to participants one week before the closing date. The questionnaire had a mixture of open-ended and closed questions to collect quantitative as well as qualitative data. This triangulation was designed to provide a greater depth of understanding to the analysis to recognise and comprehend the themes. Closed questions were asked using the Likert scale, multiple-choice, and drop-down followed by long response open-ended questions. The questionnaire contained all the information about the researcher and the project. Continuing the questionnaire implied consent.

The literature review was used as a secondary source of data to identify the major themes and implications of UDL for RTLB in their practice. These themes were used to analyse and compare the information gathered through the questionnaire.

Any intrusion to participants' privacy and confidentiality was addressed through ethical considerations. Massey University's (2017) guide was used for ethical principles involving human participants which also includes the Treaty of Waitangi principles. A low-risk ethics application was granted. To respect respondents' autonomy and to avoid harm, no question was made mandatory. Hence, the response numbers differed for each question.

Each participant was given a unique identification (R1 to R28). The quantitative data was analysed, tabled and graphed using the Excel sheet and was compared with the research to find the similarities and disparities. The qualitative data was carefully scrutinised and coded using different coloured highlighters to identify themes, patterns and trends which were then organised into categories and were analysed against the literature review.

RESULTS

In total, 28 RTLB including two practice leaders and four UDL leaders from eight clusters responded to the questionnaire. The experience of these RTLB ranged from 1-15 years in the role, 1-5 years being the most common bracket (62%). A positive weak correlation (+0.17) was noted between the number of years implementing UDL and RTLBs confidence level in using the framework. This implicates that more time

[8] The sample is chosen for an explicit purpose to expand our understanding of the phenomenon and not to make broad claims or to generalise (Mutch, 2013).

spent on UDL in the cluster increases RTLBs level of confidence level but not significantly.

Professional Learning and Development

RTLB were questioned about the cluster-wide and individual PLD undertaken in UDL. RTLB attended an average of two cluster-wide PLDs and one individual PLD. Almost half of them (n=12) did not attend any individual PLD. Of these, one-third (n=4) rated their confidence level in implementing UDL as 2 or below on a 4-point Likert scale (1=*least confident*, 4=*most confident*) (see Figure 2). A non-significant positive correlation (+0.33) between individual PLD and RTLB confidence levels was noted, which was nearly double the correlation between cluster-wide PLD and RTLB confidence level (+0.17). This implies that individual PLD enhanced RTLBs confidence level more than the cluster PLD.

The majority of these PLD (44%) were delivered once a year, followed by ongoing PLD (37%) and once a term PLD (19%). Half of the respondents (n=13) selected more than one way of receiving the PLD. The most common PLD delivery mode was cluster-wide (82%) and was most effective (39%) too. Eleven participants who identified cluster-wide PLD as most effective, commented on its benefits and usefulness by stating, "all the cluster have a shared understanding of the language and principles" (R4). Four participants preferred to have face-to-face PLD, "kanohi ki te kanohi (k2k)[9] as it can personalise the experience of learning" (R16) and "allows unpacking questions" (R14). Practical and hands-on activities in PLD were also appreciated by RTLB.

Use of UDL Principles in Practice

The purpose of this section within the questionnaire was to gain insight into UDL application in RTLB practice. Twenty-eight percent of RTLB reported that they *always* use UDL principles in their practice while nearly half of them (46%) reported using UDL *mostly* in their practice. It was encouraging to note that no RTLB reported not using the UDL framework.

Of the 27 RTLB who responded about using UDL at different steps of the RTLB sequence[10] (see Figure 3), more than three-quarters of RTLB (78%) used the UDL principles at more than two steps of the sequence, intervention being the most common step (96%). Twenty RTLB (74%) used the UDL framework for data gathering as "observations in the classroom can sometimes support the discussion and implementation of UDL" (R23).

In response to the question about ways to align UDL principles in their practice, 24 RTLB responded, with 20% of the RTLB commenting on using intervention for UDL implementation. Examples of these interventions included Zones of Regulation, Circle Time, and Mana Potential Framework. An example of including *multiple means of representation* was to give students opportunities to record their speeches, and an example of *multiple means of engagement* was using strengths-based profiles to engage students. An example of *multiple means of access* was "collecting student voice e.g. student able to select between 1-1 verbal interview, completing a survey on a device, or using a visual template" (R10). Furthermore, RTLB commented on using RTLB principles such as ecological approach, team collaboration, reflection on their practice, and strengths-based approaches as other ways to align the UDL principles in their casework.

The data indicated that 27 RTLB used the UDL principles in many areas of their work including literacy, numeracy, engagement and behaviour (see Figure 4). Nearly 90% of RTLB (n=24) have used the UDL principles in more than one area; 25% of these RTLB (n=6) have used them in four or more areas. The most common area for using the UDL principles was engagement and social skills (92%), followed by literacy (78%) and behaviour (70%). One RTLB commented, "UDL is a set of measures of behaviour within context, and a focus on altering context to reduce the mismatch between observed behaviours and expected behaviours" (R18).

[9] Māori phrase for 'face-to-face'

[10] RTLB follow a structured process of 10-step practice sequence of: 1. Initial meeting. 2. Data gathering. 3. Analysis. 4. Goal setting. 5. Planning. 6. Implementation. 7. Review, reflect, and refine (monitoring). 8. Post- implementation data gathering/follow up. 9. Review, reflect. 10. Close (MOE, 2018).

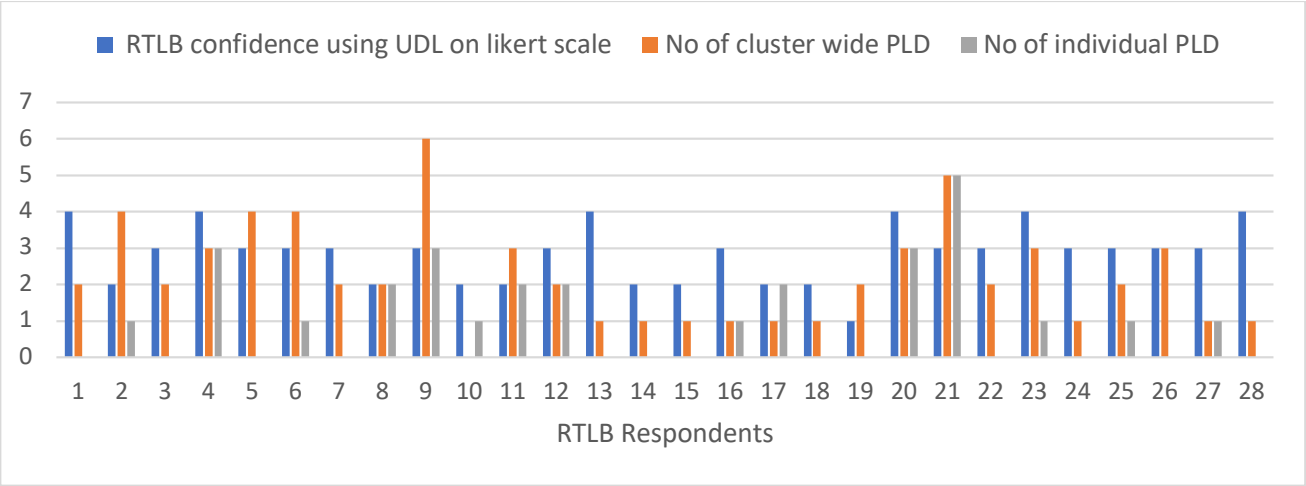

Figure 2. Correlation between cluster-wide PLD, individual PLD, and RTLB confidence level.

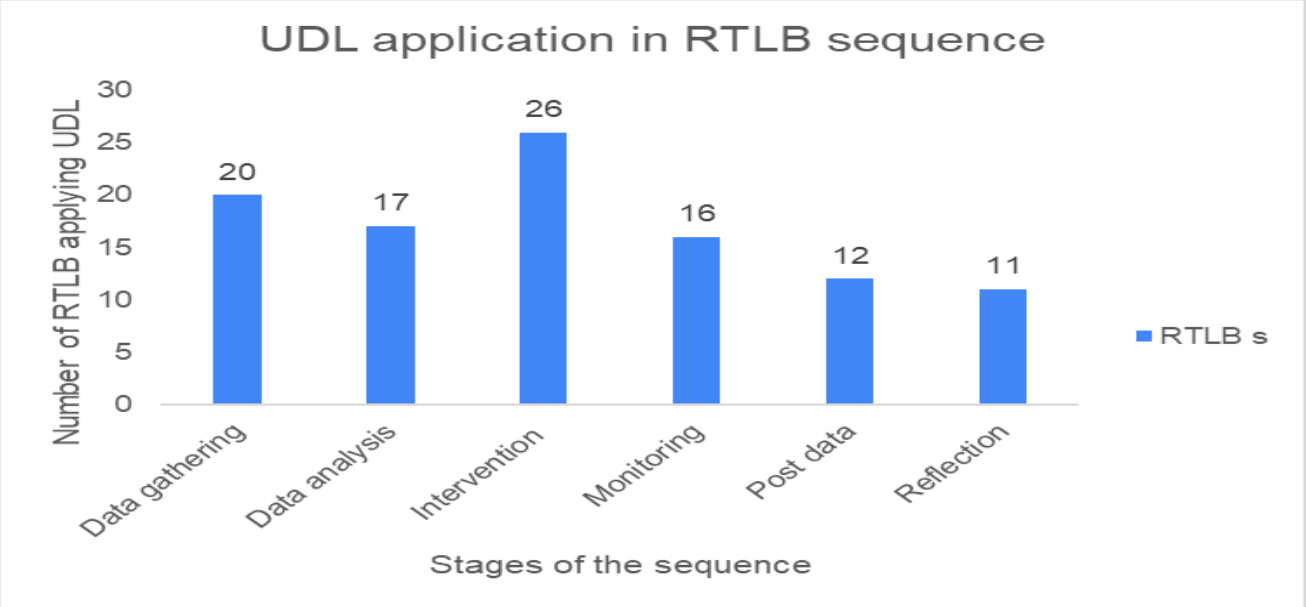

Figure 3. UDL application in RTLB sequence.

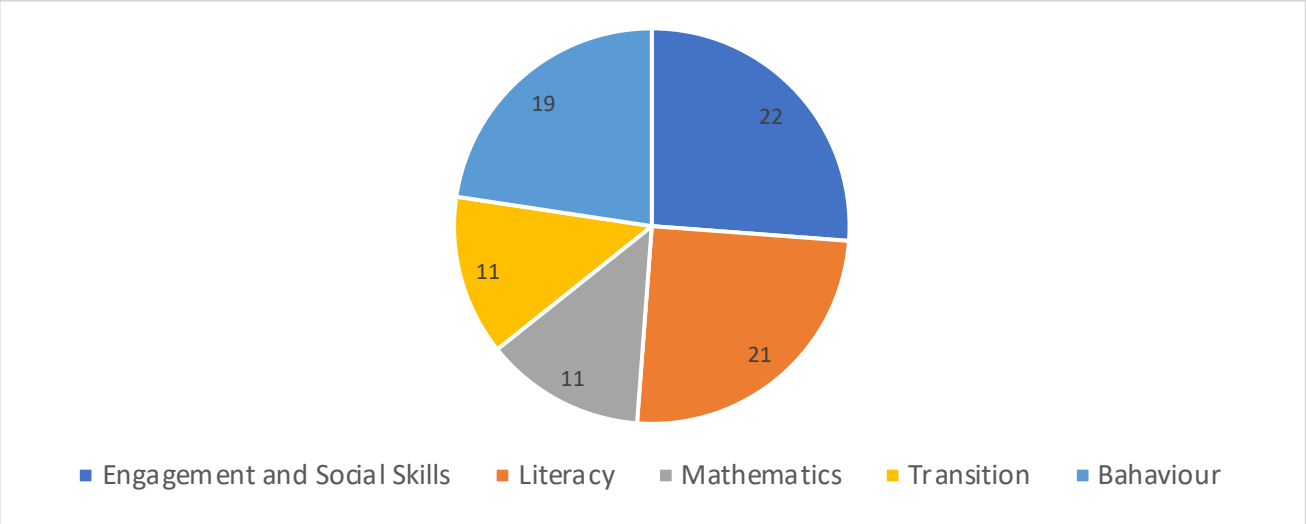

Figure 4. RTLB using UDL in different areas.

A further noteworthy finding was that 10 RTLB (40%) found the UDL framework very effective in their selected areas as it resulted in shifts in teachers' thinking by providing, "a new lens for the teacher" (R16). UDL appeared to make a positive difference by providing creative ways to increase access, give students multiple ways to present information, and provided more innovative ways for engagement. It was interesting to note that half of these RTLB (n=5) commented on the effectiveness of UDL for all learners. When the engagement principle was used, students were able to set goals, take more ownership and work collaboratively, and classrooms were more empathetic and less judgemental with a stronger sense of belonging.

When it came to evaluating the effectiveness of UDL on student outcomes, all 28 RTLB responded. Nearly half of the RTLB (n=13) compare pre-data and post-data to evaluate the effect of UDL interventions. One-fifth of the RTLB (n=5) evaluated UDL effectiveness through students' engagement while others (n=3) observed inclusion and accessibility as success indicators. However, 21% of RTLB (n=6) were not using any measures to evaluate the usefulness of UDL in their interventions.

In total, 24 RTLB responded to the question about the ways their cluster monitors the use of UDL. There was a consensus amongst 14 RTLB (58%) for lacking a structured way to record the use of UDL in their practice. One respondent favoured not to monitor it by saying, "None, and I don't think it should be. Nothing is a bigger turn off to engagement when it becomes another thing to record" (R1). Discussion in casefile management, recording in RTLB practice sequence and using in the appraisal process were the main ways to monitor the use of UDL (n=4 each).

Enablers and Barriers

All RTLB responded to the question of enablers to implement UDL (see Table 1). An overarching theme of support from colleagues and collaboration within the cluster emerged (40%, n=11). Cluster-wide PLD (n=8) and teacher buy-in (n=7) were other common enablers. R27 recognised "start small" and R4 "having a cluster-wide goal" as enablers to implementing UDL.

Table 1
Common Themes Related to Enablers

Enablers	Supporting Evidence/ Quotes
Cluster-wide	• Providing cluster-wide PLD (n=8) • Cluster-wide goal • Supportive cluster
Support and collaboration with others	• Liaising with colleagues nationally on what and how they are using UDL • Support from other RTLB in my team • Colleague discussions • Having a working party who are the experts in knowledge within our cluster, and utilising their matauranga, rauemi and talking over case scenarios/supervision to talk through experiences within your own practice.
Teachers buy-in	• Teachers who are willing to implement UDL strategies • Teachers having understanding of principles • Having staff within a setting who are on board with UDL principles

Of the 27 participants who acknowledged barriers to implementing UDL (see Table 2), the most common thread was teacher resistance (41%). Another major theme that emerged was "limited understanding of UDL across education" (R6). Under this umbrella, RTLB mentioned teachers' lack of understanding of UDL (n=8), RTLBs lack of expertise and confidence to implement UDL (n=5), and lack of training across educators (n=3). Time (n=7) was another added barrier for teachers as well as for RTLB. Funding and resources (n=4), especially in Te Reo Māori, were factors to be considered too.

Table 2
Common Themes Related to Barriers

Barriers	Supporting Evidence/Quotes
Teacher resistance	• Teachers complacent to change • Staff who are more deficit oriented in their thinking • Maybe teachers' appreciation of the framework? • Teachers ability to open themselves up to change • Fixed mindset that individuals need to be fixed up • Teachers not taking it on board - "another thing to do"
Limited understanding of educators	• Limited understanding of UDL across education • Varied teacher knowledge of UDL • Lack of a full understanding of UDL principles and guidelines • No training in UDL • Lack of training for teachers of UDL in practice for teachers - more training • Teacher confidence • Not many of my schools are aware of it
Time	• Finding time to implement PLD with other competing priorities • Time/energy • Limited time

Support to Implement UDL

In this section, RTLB were asked questions about the support provided by the cluster, the most useful support, and the desired support. In response to the question about the ways the cluster has supported RTLB, most RTLB (n=18) selected more than two ways. The majority of RTLB (n=22) were given time for collaboration with other RTLB (see Figure 5). This was also considered the most useful support (46%). RTLB also highlighted professional support networks within the cluster (n=21) and ongoing PLD (n=20) as other supports provided by the cluster. Nearly one-quarter of RTLB (n=7) were allowed to exchange ideas with other clusters. The UDL support group was considered the second most effective support (32%) although ongoing PLD did not yield effectiveness with only 7% RTLB (n=2) finding it effective.

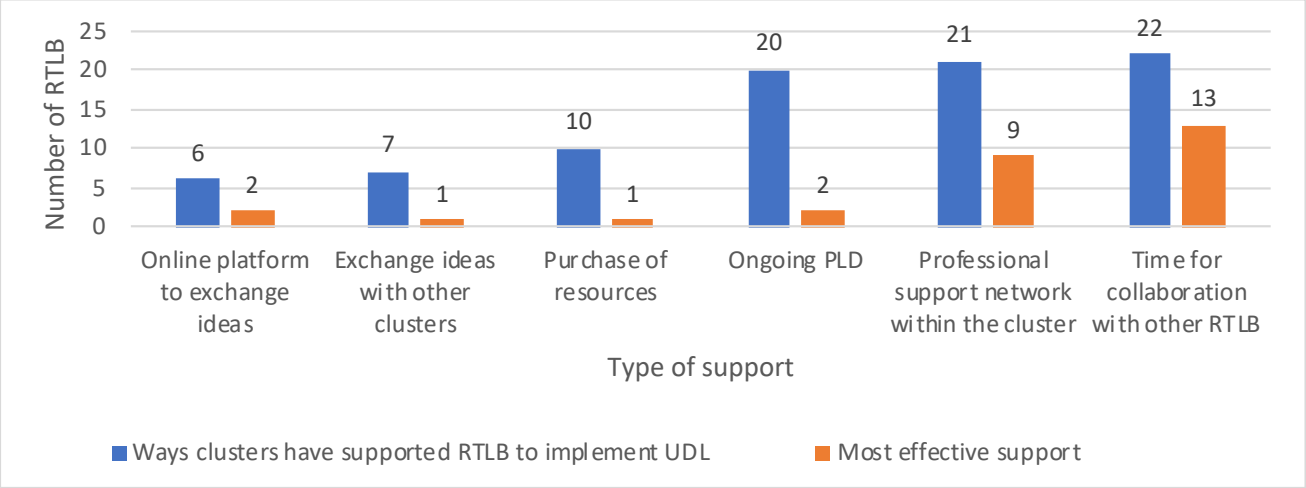

Figure 5. Support to implement UDL.

Thinking about the next steps, RTLB were asked to identify preferred modes of support that they would consider as most effective to implement UDL (see Table 3). All 28 RTLB responded with more than one option. Twenty-two RTLB (79%) identified ongoing PLD as the most preferred way. This contradicts the previous findings where only 7% considered ongoing PLD as most effective. Collaboration with other RTLB was again favoured by two-thirds of the respondents (n=19). A professional network within the cluster is another preferred way (46%) to gain assistance. It was surprising to note here that the need for a clear criterion to identify UDL was not mentioned earlier in the questionnaire as a way to support the implementation of UDL by the cluster but was affirmed by 13 respondents (46%) as the next steps to implement UDL in the cluster.

Table 3
Preferred Modes of Support

Preferred mode of support	Number of RTLB
Ongoing PLD	22
Collaboration with other professionals	19
Clear criteria to identify UDL-based intervention	13
UDL support group	13
More time for planning	8

DISCUSSION

This study aimed at identifying ways RTLB implement the UDL framework in their practice and the support they require from their cluster. Most of the findings of this research align closely with the literature.

Professional Learning Development (PLD)

Most RTLB received the UDL training once a year which is consistent with the research showing that a limited number of brief UDL PLD offerings are documented in the literature (Hromalik et al., 2020). Findings from this research suggest that both cluster-wide and individual PLD have a positive effect on RTLB confidence to implement UDL in their practice. Spooner et al. (2007) also noted that a brief training on UDL introduction resulted in a considerable amount of growth in educators' ability to include UDL-based modifications to address the needs of students with special needs. Individual PLD in this study generated a higher positive correlation with RTLBs confidence level than the cluster PLD because the individual PLD was seen to be tailored according to each person's needs. These findings are in tandem with the research conducted by Izzo et al. (2008) where respondents supported the value of on-demand training to suit individual needs.

Although individual PLD was seen to be more effective in increasing RTLBs confidence, cluster-wide PLD was identified as the most common and effective way to implement the UDL framework in this sample. This mode of PLD provided a platform for RTLB to share and collaborate ideas to develop their knowledge. The literature concurs with this approach. Being a complex framework to put into practice, UDL must be an organisation-wide approach to be effective (Edyburn, 2010; Hromalik et al., 2020).

Results of this study showed that many RTLB prefer to have face-to-face PLD as this allows them to personalise the experience and unpack questions. Although kanohi ki te kanohi is an important aspect of Te Ao Māori it may be difficult to achieve due to time constraints and other commitments (O'Carroll, 2013). Findings also indicated that RTLB preferred to have hands-on and practical UDL training as just the knowledge of the framework is not sufficient. This is consistent with the findings from Smith et al. (2019) who concluded that most UDL training overemphasised teaching a general understanding of the framework without any practical experience. Furthermore, this project's findings suggested that RTLB preferred designing the PLD itself using the UDL lens to model practical strategies to educators rather than using traditional methods. This aligns with the suggestions made by Smith and colleagues (2019).

Use of UDL Framework in Practice

The UDL framework can be applied at various levels from macro to micro levels, for example, school-wide projects to individual lessons in the classroom (Smith et al., 2019). Most RTLB in this study reported using the UDL framework in their practice at numerous steps of the sequence (MOE, 2018); data gathering and intervention being the most common steps. RTLB provided many examples of using the UDL strategies in their interventions which match with illustrations provided by Spencer (2011) such as the use of technology, formal and informal data collection, and give students choices to empower them. RTLB principles (MOE, 2018) such as a strengths-based approach, reflective practice, and an ecological approach were used as ways to align the interventions with the UDL framework to meet the needs of all students. This is consistent with the research cited in the above literature review about using the UDL framework for employing the RTLB principles.

Furthermore, this study uncovered that RTLB used the UDL framework in many areas of their practice. UDL principles were mostly used to increase students' engagement and social skills which is consistent with gains noted in the research. Year-long participatory action research demonstrated increased student engagement, improved age-appropriate social skills, and better relationships and interactions amongst students with the use of UDL-based intervention (Dymond et al., 2006; Sokal & Katz, 2015). Another main area where RTLB used the UDL principles was to improve students' literacy skills. Numerous studies have shown evidence of improvement in students' literacy skills such as improved comprehension skills (Marino, 2009) and improved rate of learning vocabulary for primary students (Proctor et al., 2011) and high school students (Kennedy et al., 2014). Furthermore, RTLB noted using the UDL principles, particularly *engagement,* to support behaviour cases which resulted in decreased behaviour incidences. This is advocated by Cook et al. (2017) and Spencer (2011) that UDL guidelines, especially *engagement*, can be used to design interventions for students with emotional and behavioural disorders to reduce behaviour problems.

In this project, RTLB identified the UDL framework to be very effective in their applied areas as it resulted in raising teachers' understanding and giving them a new lens through to think beyond the obvious. This aligns well with the research by Katz (2015) and Katz and Sugden (2013) who reported improvement in teachers' perceptions of instructional practice, self-efficacy and job satisfaction with the use of the UDL framework, resulting in them taking more ownership for creating inclusive classrooms.

A key element in implementing UDL is assessing and evaluating its success by gauging student outcomes through a range of assessment data (Wu, 2010). It is imperative to measure UDLs primary impact on target students and the secondary impact on all students in terms of enhancing their outcomes (Edyburn, 2010). RTLB used pre-data and post-data to evaluate the effectiveness of UDL on student outcomes. Anecdotal ways such as student, teacher and whānau voice, students' engagement, inclusion, and accessibility were also used as success indicators.

The challenge to reliably measure UDL implementation due to its flexibility, variability and iterative design presents an issue for educators (King-Sears et al., 2015; Rao et al., 2014). Unsurprisingly, several clusters are still developing measures to monitor the application of UDL in RTLB practice which is consistent with the literature (Basham et al., 2020). Hence, RTLB reported using anecdotal ways such as appraisal discussions and case file management in the cluster to monitor the use of UDL in their practice.

Enablers and Barriers

Canter et al. (2017) found collaboration and support within the organisation to be the most effective approach to employ the UDL framework. Within this study, these themes of support and collaboration within the cluster emerged as the most common enablers. Smith et al. (2019) supported the concept of implementing UDL practices at the state, district or school levels. Unsurprisingly then, this study found that cluster-wide PLD is seen as an added catalyst to implement UDL. Additionally, teacher buy-in is a major factor to employ UDL principles in RTLB practice. Van Kraayenoord et al. (2014) also contends that attaining 'buy-in' from staff by developing a clear understanding of the purpose and outcomes is necessary for any projects successful implementation. Having a cluster-wide goal and starting small will also help RTLB to implement UDL in the cluster, also suggested in the literature (Katz, 2015; Wu, 2010).

All RTLB were enthusiastic about using UDL in their practice, albeit they felt that several barriers exist in its implementation. Several respondents noted teacher reluctance as a major barrier, also identified by Vitelli (2015) and labelled as *collegial resistance* by Katz (2015). This barrier can be addressed by providing effective PLD as it is a primary method for teachers to expand their repertoire and to equip them with the understanding and skills to implement efficient practices (Fixsen et al., 2009). It is encouraging to note that Lanterman and Applequist (2018) also noted positive shifts in teachers' beliefs about teaching and learning after the appropriate UDL training.

Another barrier documented in the literature (Scott, 2018; Vitelli, 2015) and emerging from this study was the lack of knowledge and understanding of implementing UDL both for teachers and RTLB. This barrier may be the result of another identified obstacle of limited training for educators as asserted by Smith et al. (2019) that limited teachers' training to implement the UDL framework in authentic school settings leads to the lack of required knowledge and skills (Izzo et al., 2008). The need for additional training and support to understand and incorporate UDL has been identified as the next step (Alquraini & Rao, 2020; Smith & Lowrey, 2017).

Time is another challenge educators face that can hinder the implementation of UDL (Canter et al., 2017). Conversely, implementing UDL is seen as

time-efficient as teachers save time and energy from planning multiple programmes and monitoring student's behaviour (Katz, 2015). They may also save time by creating a tailored lesson plan in advance rather than modifying it afterward (Spooner et al., 2007).

Other challenges faced by RTLB were a lack of resources and funding. These issues, to varying degrees, have also appeared in the literature on UDL (Canter et al., 2017; Vitelli, 2015).

Support to Implement UDL

Collaboration with other RTLB within the cluster surfaced again as the most useful support in this study. To address the challenges of implementing a new intervention, Dalton et al. (2019) also recommended reaching out to others for ideas and assistance. Support networks such as the UDL group within the cluster were also identified as an effective aid in implementing the UDL framework in this project, also reinforced by research (Canter et al., 2017). Exchanging ideas with other clusters also helps RTLB to implement UDL effectively.

Lowrey et al. (2017) emphasised the importance of ongoing professional support to persevere in implementing UDL. This was reflected in this study with RTLB preferring to have ongoing PLD as an effective way to support UDL in the cluster.

Smith et al. (2019) recognised the need to establish quality indicators for reporting the existence of UDL. On this matter, RTLB also identified having a clear criterion to identify UDL practices as another desired support to implement UDL with fidelity and integrity.

RECOMMENDATIONS, FUTURE ACTIONS AND LIMITATIONS

Promoting inclusion in schools can be identified as the core business for RTLB as identified in He Pikorua. The UDL framework is the most effective means to achieve this goal. RTLB principles can be aligned with the UDL framework to support teachers to raise student outcomes. It is evident from this study that the UDL framework can be used effectively in many academic areas as well as in other contexts such as engagement and behaviour. RTLB can use the UDL principles at almost all steps of the practice sequence. Pre-data and post-data can be used to evaluate the impact of UDL interventions on student outcomes.

The overall findings reveal that collaboration and support networks within the cluster are the most important enablers to implement UDL in the cluster. Having a support group of RTLB in the cluster who share a common passion for UDL will be valuable for the cluster. The next step will be to collaborate with other clusters to exchange ideas and share expertise.

Given the consideration that UDL is a multifaceted framework to put into practice, it is a huge undertaking for RTLB to implement. Hence, this study offers insight into the importance of providing ongoing, needs-based, and practical PLD to sustain the programme and to elicit a shift in RTLB practice. A combination of individualised and cluster-wide PLD should be offered to achieve gains from both modes. The PLD must be aligned with the cluster strategic plan to be effective. As UDL planning is intentional and proactive, it would be desirable to develop a strengths-based cluster observation tool to identify and monitor the UDL framework in action. In the meantime, RTLB can use anecdotal ways to monitor and evaluate UDL such as recording in their practice sequence.

As UDL is an inclusive framework, it must be implemented for the whole class or school. In this process, RTLB may face resistance from teachers or the school. This resistance may be due to teachers' lack of knowledge and understanding of the framework and should be handled with care by offering an introductory PLD on UDL to schools to identify the purpose, structure and parameters of the framework. A cluster-wide PLD resource can be produced by the UDL group as the first step of offering support for UDL implementation.

The results of this study should be interpreted with caution given that the focus was only on RTLB, not on other educators. Caution should also be taken while considering the voluntary nature of participation which yielded results only from a few RTLB in some clusters across NZ. Hence, the results of this study cannot be generalised for other educational institutions.

This research should be replicated for implementing UDL in NZ schools, noting how it leads to inclusion. Another important future avenue for research includes exploring the use of the UDL framework on students' outcomes. A further area of research would be to investigate additional ways to measure and monitor the level of UDL implementation in NZ schools.

CONCLUSION

In comparison with the USA, UDL in NZ is still in a nascent stage. RTLB are in a prime position to work with teachers to build their capacity to use the UDL framework in their practice to make learning accessible for all to achieve the goal of inclusion. Most RTLB reported using UDL effectively at numerous steps of the RTLB sequence in many areas of their practice, aligning the RTLB principles with the UDL framework. To support RTLB to embed the identified strategies within the UDL framework, providing ongoing PLD and developing professional networks will be beneficial to implement UDL effectively in their practice.

> *"If UDL is totally successful, we should see, hear and breathe it in all contexts" (R20).*

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AUTHOR PROFILE

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APPENDIX A
Google Form

1. Which cluster do you work in?
2. What is your role in the cluster?
3. How long have you been in the RTLB role?
4. How long has your cluster been implementing the UDL framework?
5. How many cluster-wide PLDs did you attend for UDL?
6. How many individual PLD did you attend for UDL?
7. How often did you receive the PLD?
8. How were these PLD delivered? (You may select more than one option)
    i. University modules including RTLB training
    ii. Cluster-wide PLD
    iii. Online
    iv. Other (Please specify)
9. Which delivery option was the most beneficial and why?
10. How often do you use the UDL principles in your casework?
11. At what stage of the practice sequence do you use UDL principles? (You may select more than one option).
    i. Data Gathering
    ii. Data Analysis
    iii. Intervention
    iv. Monitoring
    v. Post-data
    vi. Reflection
    vii. Other (Please specify)
12. How do you align the UDL principles with your casework? Share an example below.
13. Have you used the UDL framework in your interventions in these areas? (You may select more than one option)
    i. Engagement and Social Skills
    ii. Literacy
    iii. Mathematics
    iv. Behaviour
    v. Transition
    vi. Other (Please specify)
14. How effective was the UDL framework in the selected area? Elaborate on your answer above.
15. How do you evaluate the effect of UDL interventions on student outcomes?
16. What are some of the enablers that supported you to implement the UDL principles in your practice?
17. What are some of the barriers to implementing UDL in practice?
18. How confident do you feel using the UDL framework in your practice? (Likert scale 1-4). Elaborate on why you have given yourself the above rating.
19. What are the ways your cluster has supported you to implement the UDL framework in your casework? (You may select more than one option)
    i. Ongoing professional learning and development
    ii. Online platform to exchange ideas
    iii. Professional support network within the cluster
    iv. Purchase of resources
    v. Exchange ideas with other clusters
    vi. Time for collaboration with other RTLB
    vii. Other (Please specify)
20. Which cluster support has been most helpful to implement UDL?
21. How does your cluster monitor/collect data on the use of UDL in RTLB practice? e.g. RTLB note which principle, guidelines, or checkpoint is used in the intervention on the database.
22. What are some of the ways that would assist you to provide better support to implement UDL in your practice? (You may select more than one option)
    i. Ongoing PLD
    ii. UDL support group in the cluster
    iii. More time for planning
    iv. Collaboration with other professionals
    v. Clear criteria to identify UDL based intervention
    vi. Other (Please specify)