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Mathews, E. (2018) *Language, Power, Resistance: Mainstreaming of Deaf Education*. Washington DC: Gallaudet University Pres**s.**

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CONTENTS

EDITORIAL

The publication of REACH: *Journal of Inclusive Education in Ireland*, volume 38.2, comes at a time where many scholars have noted that we are at a crossroads in relation to inclusive education in Ireland (see, for example, Howe and Griffin, 2020; Shevlin and Banks 2021). The crux of the inclusion debate is currently centred around the dichotomy of a segregated and an all-inclusive education system, imagined via the dedication to full inclusion, yet an increase in the number of special schools and classes dominating the Irish Educational landscape. As Ireland commits to the UN Convention on the Rights of Persons with Disabilities (UNCRPD) we face the dilemma, as Travers (2025) points out, whereby we prioritise the rights of children to inclusive education over parental rights to choose alternatives. Despite this tension, there is ongoing dedication to ensuring every child and individual is included in either mainstream or special settings and this is reflected in the work of the current volume.

The many themes of volume 38.2 of the journal endorse the pledge to inclusive practices and the ongoing work being done across early childhood, primary, post primary and higher-level education settings. Jennifer O'Sullivan's article on "Prevention Over Remediation: A New Paradigm in Addressing Reading Difficulties" explores the key components of the preventive approach and highlights its transformative potential for improving reading outcomes. Margaret Flood explores Ireland's inclusion trajectory and it's evolving thinking around UDL through an exploration of UDL's emergence in Irish curriculum in her article: "The emergence of Universal Design for Learning (UDL) in Irish curricula as an approach to Inclusive Education in the Republic of Ireland".

Three of the articles explore inclusive practices in post primary settings. Carol Kennedy – Gardiner examines teacher recruitment policies for educating learners with English as an Additional Language (EAL) in Irish post-primary schools in her work: "How the Policy of 'Out of Field Teachers' is Challenging Reimaging and Embracing Change in Language and Education Policy in Post-Primary Schools in Ireland". There is an examination of the general attitudes towards inclusive education and on inclusive pedagogical practices utilised by post-primary STEM teachers in Ireland in: "Inclusive Education and Pedagogy in Post-Primary Stem Classrooms" by David Byrne, Frank Kehoe and Patricia McGrath. Jane Brennan investigates the experiences of post-primary teachers in Ireland in facilitating the use of assistive technology (AT) for students with specific learning difficulties in her article: "Facilitating Assistive Technology Use for Students with Specific Learning Difficulties: Insights from Irish Post-Primary Teachers"

It has been a busy year in terms of inclusion, and this volume gives us a glimpse of what is going on in educational settings. This year, in June 2025, was a landmark time in Ireland when the Minister for Education and Youth, Helen McEntee, and Minister of State with responsibility for Special Education and Inclusion, Michael Moynihan, announced the publication of the Report on the Review of the Education for Persons with Special Educational Needs (EPSEN) Act 2004. Key recommendations of the Review as noted on the Department of Education website include:

- consideration to be given to include all school-age children under one Act to provide a legal rights-based inclusive education
- language use in the area of additional needs to be considered further
- to ensure that the rights of the child, and their voice, in relation to their educational needs, are a central part of educational changes
- to complete the work on the roadmap towards an inclusive education system
- to legislate for Student Support plans
- to work towards legislating for a legal right of access to pre-school
- to build upon the steps being taken in relation to the Irish language in the context of children with additional needs, so that they can be supported through the medium of Irish
- consideration to be given to a review of the Disability Act 2005, with particular focus of the Assessment of Needs process
- more focus on transitions between educational settings

Miriam Colum, Editor.

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HOW THE POLICY OF 'OUT OF FIELD TEACHERS' IS CHALLENGING REIMAGING AND EMBRACING CHANGE IN LANGUAGE AND EDUCATION POLICY IN POST-PRIMARY SCHOOLS IN IRELAND

The concept of 'full inclusion in Irish education' implies that all teachers will possess the necessary skills to instruct all learners. Learners who have English as an Additional Language (EAL) would benefit from teachers who are committed to supporting their educational pursuits. The probability of this occurring in an Irish post-primary setting appears to be hindered by the concept of 'out of field teachers,' which is supported by the Department of Education's Circular 0014/2017. The term 'out-of-field teachers' refers to educators who are qualified in a specific subject area but are assigned to teach a different subject outside their area of expertise (Teaching Council, 2011a).

This article aims to assess the policy governing the establishment of professional prerequisites for educators in Irish post-primary schools. It analyses the pedagogical proficiency demanded by the Department of Education (DE) in their policy documents, as well as potential variations that may arise. When analysing Circular 0014/2017 from both an international and national perspective, it becomes evident that the policy in Ireland, which does not mandate Special Education Teachers (SETs) to possess a specialised qualification in Special Needs Education, or require SET's to have expertise in their subject area, is not beneficial for learners or teachers. The circular implies that teachers who support language learning and those who work with learners with additional educational needs will receive extra professional development opportunities. However, this paper specifically addresses the potential gaps in practice that may arise due to the unclear policy documentation and the absence of clear guidance regarding the qualifications required for teachers working with learners. The paper will determine that the utilisation of 'out of field teachers' to assist learners with additional educational requirements, such as language help or those diagnosed with special needs, is detrimental to both the learners and potentially the teachers.

Keywords: English as an Additional Language (EAL); Out-of-field teachers; Pedagogical proficiency, Inclusive education, Equity in education

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INTRODUCTION

This paper examines teacher recruitment policies for educating learners with English as an Additional Language (EAL) in Irish post-primary schools, employing Carol Bacchi's "What's the Problem Represented to Be?" (WPR) policy analysis framework (Bacchi and Goodwin, 2016). Rooted in Foucault's (1994) theories, the WPR approach critiques Irish government policy by analysing its cultural and social context. This study applies Bacchi's six-step methodology to investigate gaps in the literature, focusing on the Special Educational Continuum of Support for EAL learners and proposing practical solutions.

The Guidelines for Special Educational Needs (Department of Education and Skills, 2017a) designate EAL as part of the Special Educational Needs (SEN) Department's remit, reflecting a broader policy emphasis on ongoing teacher training. While many SET teachers' feel capable of supporting a range of additional educational needs, they often lack preparation for EAL-specific challenges. Collinson et al. (2009) link educational reform to broader social policies, underscoring the importance of grassroots support for policy implementation. The influx of EAL learners following the Ukrainian conflict, particularly in schools with minimal prior experience, highlights a pressing need to address these gaps.

A disconnect exists between idealistic policy goals and the realities of classroom practice, as seen in initiatives like No Child Left Behind in the U.S. and similar efforts in Europe. This article critiques the Department of Education's policies

on teacher qualifications for SEN and EAL roles, as well as the placement of EAL within the SEN Continuum of Support. Forde et al. (2020), emphasise Bacchi's framework in exploring how administrative discourse and school leadership practices influence policy enactment. Teachers must critically evaluate the intentions behind policies and question their practical classroom implications.

Social justice leadership is crucial when addressing the needs of vulnerable groups like EAL learners (Bracken, Driver and Kadi-Hanifi, 2016; Gardiner-Hyland, 2025). It is important that the needs of EAL learners and their teachers are being met. The Department of Education aims to provide a robust framework for EAL education, yet clearer guidelines are necessary to bridge the gap between policy and practice. A year after crisis-driven policy changes, it is time to reassess and refine these measures. School culture significantly influences the prioritisation of EAL learners (Batardière et al., 2022), and personal connections to the issue often drive meaningful change (Burke, 2023, Coleman, 2022). However, this journey can be challenging, as schools and EAL learners redefine their identities within an evolving cultural and educational landscape (Batardière et al., 2022).

QUESTION 1: WHAT'S THE PROBLEM REPRESENTED TO BE IN A SPECIFIC POLICY OR POLICIES?

Some teachers certified in special education, despite their interest and expertise, may feel unprepared to address the teaching and learning needs of EAL students. Recruiting trained and experienced teachers to support EAL learners within the Continuum of Support remains a critical challenge. This framework, developed by the National Educational Psychological Service (NEPS), (Department of Education and Skills, 2021) provides a systematic approach to meeting diverse student needs, prioritising early intervention, inclusivity, and adaptability (Department of Education Inspectorate, 2024).

Over the past two decades, teaching and learning in SEN have undergone transformative changes in Ireland (Howe and Griffin, 2020). Teachers have grappled with evolving policies while redefining their roles amidst systemic shifts. Public attitudes towards special education have also changed, placing inclusion at the forefront of educational discourse (Adenusi, 2023; Banks et al., 2016; Department of Education Inspectorate, 2024; Fennell, 2021; MacGiolla Phádraig, 2007; Ring and Travers, 2005; Rose, 2021). This perspective is informed by the author's 20 years of experience as an SEN and EAL teacher and as EAL Lead for Oide in Ireland.

EAL education is classified under SEN by the 2017 *Guidelines for Post-primary Schools Supporting Learners with Special Educational Needs (DE, 2007)* DES Circular 0014/2017 grants schools autonomy to address EAL needs, emphasising that assistance should align with recognised needs and regular evaluations (Gardiner-Hyland, 2021). Resources must support fully inclusive schools, prioritising learners with the greatest needs and ensuring continuity of support through appropriately skilled teachers (Adenusi, 2023; Ajala, 2023; Department of Education Inspectorate, 2024; McGinley, 2023). However, all teachers must receive professional development to meet the diverse needs of SEN and EAL learners (Bubb and Earley, 2007; Lowe, 2016).

Ireland's policy contrasts with other nations (Batardière et al., 2022), which often require additional certification for SEN roles. In several US states, for instance, SEN teachers must complete extensive professional education beyond their initial qualifications (White and Mason, 2003; 2006). In Ireland, however, a general teaching qualification suffices for SEN settings (Herzog-Punzenberger et al., 2022).

The United Nations Convention on the Rights of Persons with Disabilities (2007) underscores the importance of qualified teachers, highlighting the gap between policy ambition and the reality of teacher shortages and rising EAL numbers in Ireland (Keane, Flynn, and Kealy, 2023). International perspectives, such as those outlined by Rizvi and Lingard (2009), also influence equality policies. DES Circular 0031/2011 stressed the need for qualified SEN teachers, yet it did not define "appropriately qualified," leaving gaps in expectations for EAL educators (Department of Education and Skills, 2011).

Teachers face dual challenges of managing their well-being alongside pedagogical demands. While SEN educators require specialised training (Coolahan, 2007; Kang and Martin, 2018; OIDE (2025–26)), the same applies to EAL. Effective EAL teaching demands targeted training to ensure learners can progress academically (Gardiner-Hyland and van den Hoven, 2025; OIDE (2025–26). However, DES Circular 0014/2017 lacks clarity on qualifications for EAL teachers, placing responsibility on school administrators to assign roles based on perceived expertise.

The Teaching Council's 2020 *Céim* framework for Initial Teacher Education (ITE) (2020) mandates foundational SEN training for all teachers, with research showing that initial training in SEN and inclusive education empowers professionals and benefits learners (Department of Education Inspectorate, 2024; Göransson et al., 2019; Kang

& Martin, 2018; Kennedy, 2018; Kurniawati et al., 2017; Mngo & Mngo, 2018) . Despite this, SEN and EAL remain underemphasised in Irish education (Rodden et al., 2019). Inclusion requires systemic adaptation rather than placing additional burdens on learners and their families (Adenusi, 2023; Ajala, 2023).

QUESTION 2: WHAT DEEP-SEATED ASSUMPTIONS UNDERLIE THIS REPRESENTATION OF THE "PROBLEM"?

There are deep-seated assumptions in policy documents regarding EAL education. First, it is presumed that Boards of Management prioritise EAL needs when planning, and second, that teachers assigned to EAL roles willingly and effectively meet learners' requirements. However, these assumptions are often unrealistic.

Irish literature on EAL in post-primary settings is limited, yet parallels with SEN policy reveal legislative and systemic shortcomings (Rodden et al., 2019). Ineffective teaching methodologies and inadequate preparation negatively impact learner outcomes (O'Gorman et al., 2009). Despite policy guidelines assuming administrative prioritisation of EAL learners, research shows school leaders face significant strain balancing government demands with professional integrity (Macbeth et al., 2018; Murphy, 2020). Consequently, SEN – and by extension EAL – often ranks low on their priorities (Menken and Sánchez, 2019; DeMatthews et al., 2021). EAL learners, often isolated linguistically and socially, may lack advocates due to parental language barriers (Adenusi, 2023; Burke, 2023).

In practice, EAL timetabling is frequently an afterthought, with part-time teachers or those from unrelated subjects being assigned EAL hours. Anecdotally many report feeling underprepared and lack the expertise to meet EAL students' needs, especially newly qualified teachers who often receive full EAL schedules (Coolahan, 2007; Thorius, 2019). Research emphasises the importance of equipping educators with the skills to support EAL learners academically and socially (Canagarajah, 2013a; Coleman, 2022; Hansen-Thomas et al., 2016; Reis, 2011). However, this vision remains unrealised in many schools (Gardiner-Hyland, 2021; Menken and Sánchez, 2019).

King (2019), referencing Ball (2006), notes that policies do not dictate actions directly but limit the range of available choices. Addressing the changing EAL context requires reviewing policies to align with current needs while adapting to school cultures and contexts. Teachers need clear pathways into EAL roles, fostering confidence and empowerment (Ahn, 2014; Busch, 2001; Robinson, 2017). They must be equipped to teach effectively while receiving the resources necessary to meet learners' diverse needs (DeMatthews et al., 2021; Gardiner-Hyland, 2021).

EAL learners face complex social and emotional challenges that require a whole-school approach (Beehler et al., 2012; Block et al., 2014; Cowne et al., 2018; Taylor and Sidhu, 2012). EAL teachers play a vital role in helping students access the curriculum (Brooks et al., 2021; Keane et al., 2023; Leung and Richardson, 2023), progressing beyond Basic Interpersonal Communication Skills (BICS) to achieve Cognitive Academic Language Proficiency (CALP) (Cummins, 2013). CALP, essential for academic success, involves higher-order thinking skills like analysis, synthesis, and evaluation (Coleman and Goldenberg, 2010; Cummins and Yee-Fun, 2007; Nyoni, 2021; Webster, 2013).

While care for learners is important, teachers must combine empathy with expertise to truly make a difference (Hargreaves, 2003; Hargreaves and Fullan, 2015, 2020). Developing inclusive and effective educational practices for EAL learners requires skilled, confident professionals with the necessary tools and training (Department of Education Inspectorate, 2024; OIDE (2025–26), Webster, 2013).

QUESTION 3: HOW HAS THIS REPRESENTATION OF THE "PROBLEM" COME ABOUT?

Until recently, discussions about English as an Additional Language (EAL) learners in Ireland were minimal. Before Russia's invasion of Ukraine, EAL learners in Irish schools were predominantly from urban areas and represented diverse backgrounds (Mistry and Sood, 2012). However, the war led to an unprecedented enrolment of EAL learners in rural schools, forcing schools to quickly adapt. Teachers were recruited to address the immediate needs of these learners, resulting in varied roles and responsibilities for those teaching EAL students (Block et al., 2014; Gardiner-Hyland, 2021).

Despite schools' efforts, gaps in understanding emerged, with some teachers mistakenly assuming EAL learners were solely the responsibility of EAL specialists (Beehler, Birman, and Campbell, 2012). However, the *Continuum of Support* places responsibility for EAL learners with mainstream classroom teachers (Department of Education and Skills, 2007). While the Teaching Council's guidelines (Teaching Council, 2011b; 2020) require all teachers to understand SEN and EAL, those working closely with SEN learners should ideally possess additional qualifications in this area.

Each EAL student has distinct social, emotional, and learning needs. Like SEN learners, they require tailored instruction to succeed (Robinson, 2017; Rodden et al., 2019; Adenusi, 2023). Teachers must account for these individual needs when

planning lessons, ensuring inclusivity for all students (Canagarajah, 2013b; Department of Education Inspectorate, 2024; Florian and Camedda, 2020; McGinley, 2023; Ring and Travers, 2005; Rose, 2001; Rose, 2021) By March 2022, inadequate training and knowledge were already impacting classrooms (George and Maguire, 2019; Kurniawati et al., 2017). Addressing this gap remains critical for professional educators.

EAL teachers play a dual role: facilitating academic achievement and integrating learners into the wider school community (Haslam, 2006). This role often extends to pastoral care due to their deep understanding of learners' challenges (Billingsley et al., 2009; Robinson, 2017). Schools must provide adequate support, recognising the additional professional development EAL teachers often pursue independently, as well as prioritising their well-being to ensure effective support for EAL learners (Coleman, 2022).

QUESTION 4: WHAT IS LEFT UNPROBLEMATIC IN THIS REPRESENTATION?

A number of critical difficulties remain. On a macro level, the Department of Education's policy directs schools to conduct EAL within the Continuum of Support and to make local judgements. Second, there is a lack of clarity on the credentials needed to operate as an EAL teacher.

There seems to be a government quiet on teacher credentials and special educational needs (O'Gorman et al., 2009; Rodden et al., 2018). There are modest signs that may push management in the correct direction, but this is where the story stops (Murphy, 2020). Compared to other countries such as England and Australia, we need better guidance in this area (Canagarajah, 2013a; Cummins and Yee-Fun, 2007; Hansen-Thomas et al., 2016; Leung and Richardson, 2023).

As school leaders begin to create EAL schedules for the following year, it would be helpful if there was a policy outlining why certain teachers are chosen to teach in the EAL department. Even the establishment of an EAL department in certain schools would be much appreciated (Szymczyk, Popan and Arun, 2022; Wang and Sun, 2021). When one takes the time to investigate a school's unwritten policy about timetabling choices, what teachers teach, to whom, and at what age and stage, one may discover a lot about the school's cultural approach to EAL and inclusion (Department of Education Inspectorate, 2024; Mistry and Sood, 2020). At the micro, meso, and macro levels (Devecchi et al., 2012; Göransson, Lindqvist and Nilholm, 2015; Kurniawati et al., 2017; Travers, 2006), we can see a narrative about the whole school approach to EAL learners and how they are supported in their learning and inclusion in the school (Adenusi, 2023; Burke, 2023; Coleman, 2022; Department of Education Inspectorate, 2024; McGinley, 2023).

School culture discourse concerning EAL might disclose more in its silences than in its pronouncements. According to Zepeda and Ponticell (1997), we may not always be aware of the cultural themes being conveyed in our schools. The silences reveal more about the lessons learnt and the public views of school administrators than any lofty policy. Finally, for learners adjusting to a new culture, social environment, and language, the unsaid signals we communicate might be the most impactful (Adenusi, 2023). For many, EAL seems to be just another addition to school policy, rather than something the school really believes in (Mistry and Sood, 2020). To become really ingrained in culture, EAL must be part of regular educational practice rather than something celebrated once a year (Haslam, 2006). It appears in every parental notification, every non-uniform day, and every celebration (Webster, 2013). Several studies have shown that what is promoted by school administration and culture has a substantial influence on how teachers strive towards inclusion in their classes (Avramidis and Norwich, 2002; Mistry and Sood, 2020). It is critical for schools to recognise that cultural silences may emphasise and muffle other areas we consider significant or not (Abrams and Abrams, 2021; Murphy et al., 2022; Wilkinson, 1997).

QUESTION 5: WHAT EFFECTS ARE PRODUCED BY THIS REPRESENTATION OF THE "PROBLEM"?

The EAL Policy has a significant impact on EAL learners and teachers at the national, municipal, and school levels. Our approach to caring for those with the highest degree of need reflects our societal and national values (Bracken, Driver, and Kadi-Hanifi, 2016). The relationship between a country's social and educational policies and teacher professional development is illuminating in terms of our priorities and what we consider to be valuable and significant (Collinson et al., 2009; King, 2011, 2014, 2019). King (2019) establishes a connection between professional development and its ability to empower teachers in their efforts to promote inclusion.

If our nation really aims to enhance student outcomes for EAL learners, it is crucial that we dedicate time, effort, and resources to continual professional development in the field of EAL (Block et al., 2014; Gardiner-Hyland, 2021). Effective teaching of EAL learners requires educators who have a comprehensive understanding of the learners' current level, their future learning goals, and the necessary steps to bridge the gap (Merrins et al., 2023). Research by Cummins and Yee-Fun (2007) suggests that when learners are taught by such educators, their learning outcomes are

significantly improved. In contrast, learners who are assigned to educators solely based on the number of hours they need to fulfil (Billingsley et al., 2009. Howell, Bradshaw and Langdon, 2022; Ingersoll, 2003) may not experience the same level of improvement.

Furthermore, it is noteworthy that their teachers are often recently appointed teachers in our post-primary schools.

Whilst, they often serve as 'out of field' teachers. Recent research suggests that they are feel better for the multi-lingual classroom than some of their colleagues (Gardiner-Hyland and van den Hoven, 2025). Occasionally, they get hourly contracts and aspire to create a favourable professional image to be employed by the school to instruct in their preferred topic, transitioning into their desired area of study. However, they might refrain from vigorously advocating for their students as they want to create a favourable impression on school administration and leadership to ensure future employment within the institution. Their designation as 'out of field teachers complicates advocacy efforts.

This lack of representation is particularly evident for EAL learners who are still acquiring English proficiency. Among these are Traveller, Mincéir, and Pavee communities within Irish society, who often do not use English as their primary language at home and have historically faced systemic marginalisation in both societal and educational contexts (McGinley, 2023; Stewart, 2024). Other EAL learners are new arrivals in our country, it will take time for them and their parents to find their voices and to advocate for themselves. As such, EAL learners are some of the most marginalised learners in our schools. They don't yet have a voice to advocate for themselves (Gardiner-Hyland, 2025).

QUESTION 6: HOW AND WHERE HAS THIS REPRESENTATION OF THE "PROBLEM" BEEN PRODUCED, DISSEMINATED AND DEFENDED?

The dissemination of challenges associated with the EAL policy occurs at multiple levels—national, municipal, and school—through societal and educational systems. At a national level, it is essential to examine the intended beneficiaries of educational programmes (Cambois et al., 2016). This raises critical questions about why English as an Additional Language (EAL) is included within the *Continuum of Support* (Department of Education, 2007) and why the *Guidelines for Schools* (NEPs, 2007) provide limited information on the topic. Howell, Bradshaw, and Langdon (2022) argue that policy decisions are often shaped by those in powerful societal positions who manipulate them for their benefit. Skelton (2019) highlights that marginalised groups, such as EAL learners, frequently lack a voice in policy discussions.

A country's alignment between its social policies, educational priorities, and teacher professional development reflects its values and what is deemed significant (Collinson et al., 2009; King, 2011, 2014, 2019). King (2019) links professional development to empowering teachers in fostering inclusion, but the absence of robust EAL-specific training systems perpetuates the issue, however, Oide have made inroads recently in this area (OIDE; 2025–26). Research further underscores the role of school culture in shaping teacher attitudes and fostering effective inclusion (Department of Education Inspectorate, 2024; Hulme et al., 2019; Jerrim, 2020; Mullaney, 2017). Failing to prioritise inclusive education that meets the needs of EAL learners undermines efforts to create safe, supportive environments where all students can thrive (Adenusi, 2023; Burke, 2023; Gardiner-Hyland, 2021; Holmqvist, 2019; McGinley, 2023; Mullaney, 2017).

The challenges are further disseminated through structural vulnerabilities within the teaching workforce. EAL learners are often assigned to recently hired or "out-of-field" teachers—educators working outside their area of expertise. These teachers, typically employed on hourly contracts, may prioritise cultivating a favourable professional image to secure long-term employment in their preferred subject rather than advocating strongly for their students. This dynamic reflects systemic shortcomings in the allocation of trained educators and weakens the advocacy needed for this marginalised group (Merrins et al., 2023).

The problem is compounded by EAL learners' limited capacity to advocate for themselves. Many learners do not use English as their primary language at home and have historically faced systemic marginalisation in both societal and educational contexts (McGinley, 2023 Stewart, 2024). Similarly, new arrivals to Ireland face barriers as they and their families acclimate and find their voices. Without strong support, EAL learners—often among the most marginalised in schools—struggle to access the advocacy and resources they need to succeed (Coleman, 2022).

CONCLUSION

This article analyses policies on recruiting teachers for post-primary learners with English as an Additional Language (EAL) using Carol Bacchi's "What's the Problem Represented to Be?" (WPR) method. Bacchi's framework reveals the complex interaction between policy and practice within Irish government policy and the Special Educational

Continuum of Support, highlighting significant gaps between policy objectives and the realities faced by educators and EAL learners.

The study underscores the urgent need for a well-organized system to recruit and train EAL teachers. Current policies lack clear certification standards and norms, leaving significant discretion to school administrators, often resulting in insufficient support for EAL learners. These challenges are compounded by the assumption that all teachers inherently possess the skills and willingness to meet EAL learners' diverse needs without additional training or resources.

The research critiques policy assumptions, such as the expectation that school leaders prioritize EAL in staffing decisions and that teachers assigned to EAL roles are adequately trained. Practical challenges, including a lack of preparation and a sense of inadequacy among educators, further widen the gap between policy and implementation.

The paper also explores the cultural and social dimensions of EAL education, emphasizing the importance of embedding EAL within the broader educational framework rather than treating it as an isolated post-primary concern. School culture plays a pivotal role in shaping the experiences of EAL learners and educators, underscoring the need for more inclusive and supportive environments (Department of Education Inspectorate, 2024).

Ultimately, the study calls for a reassessment of policies to align better with the needs of EAL learners and educators. Recommendations include defining explicit teacher credential requirements, fostering continuous professional development, and cultivating an inclusive educational culture. Addressing these deficiencies will help ensure that EAL learners receive the high-quality education they deserve, facilitating their academic and social integration.

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PREVENTION OVER REMEDIATION: A NEW PARADIGM IN ADDRESSING READING DIFFICULTIES

Proficient reading is vital for students' future academic success and personal development; however, word reading difficulties create significant barriers that can hinder both. This paper advocates for a paradigm shift towards more preventive approaches to reading difficulties, which emphasise early identification and evidence-based intervention before reading difficulties become entrenched. Prevention focuses on universal screening, systematic phonics-based instruction, and continuous progress monitoring, distinguishing itself from traditional intervention models that often address issues only after significant academic delays occur. By identifying and intervening early, teachers can provide tailored instruction that not only improves reading proficiency but also reduces long-term academic, emotional, and social consequences. This article explores the key components of the preventive approach and highlights its transformative potential for improving reading outcomes.

Keywords: *Reading difficulties, preventive approach, early identification, early intervention, universal screening*

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INTRODUCTION

Early reading difficulties pose significant barriers to the development of proficient literacy skills, particularly in the areas of word recognition and decoding, which are essential for fluent and effective reading. When students struggle to decode words, they often find it difficult to sound out words, leading to slow, effortful reading. These challenges can limit their ability to automatically recognise words which inhibits fluency and, ultimately, reading comprehension (Catts et al. 2003). Research indicates that difficulties with decoding are a hallmark feature of dyslexia, a specific reading difficulty characterised by persistent problems with word reading, spelling, and phonological processing despite adequate instruction (Fletcher et al. 2019). Early identification and evidence-based intervention are crucial for these students, as persistent word reading difficulties can severely impact academic progress and literacy development over time (Catts et al. 2001). Early intervention provides targeted, systematic support that can help students build foundational reading skills and close achievement gaps. By acting proactively, teachers can reduce the severity and prevalence of reading difficulties, leading to more successful reading development for at-risk students (Catts and Hogan 2021; Lovett et al. 2017; Shapiro and Solity 2008).

The purpose of this paper is to explore the concept of a preventive approach to addressing reading difficulties, particularly those that manifest early in a student's reading development. Rather than relying on traditional remediation approaches that address reading problems only after they have become entrenched, this paper advocates for early, proactive identification and support to mitigate future reading difficulties. The paper outlines the theoretical foundations of a preventive approach, reviews the evidence supporting the need for early identification and intervention, and provides recommendations for implementing these measures. By focusing on early screening and targeted, timely interventions, it aims to demonstrate how a preventive approach can improve reading outcomes and reduce the long-term impact of reading difficulties.

THEORETICAL FRAMEWORK

The Simple View of Reading (SVR) model, introduced by Gough and Tunmer in 1986, provides both a framework for understanding reading development and a means by which we can identify reading difficulties. According to the SVR, reading comprehension – understanding what we read – depends on two key components: decoding and language comprehension.

- Decoding is the ability to sound out words, which requires phonemic awareness (understanding the individual sounds in spoken words) and letter-sound relationships (phonics).
- Language comprehension involves understanding the meaning of words, sentences, and overall text, using vocabulary, background knowledge, and oral language skills.

In the SVR model, the interaction between decoding and language comprehension forms the foundation of reading success. When one or both of these components is impaired, reading difficulties can arise. For example, a student who struggles with decoding may find it difficult to read words accurately. Students with dyslexia typically face challenges with the decoding component of reading (Snowling and Hulme 2012). Conversely, a student with difficulties in language comprehension may be able to read words accurately but will often struggle to understand their meaning or what they have read. This could stem from gaps in vocabulary, limited background knowledge, or weak oral language skills (Nation 2019). The SVR model highlights the importance of providing instruction in both decoding skills and language comprehension to prevent reading difficulties. Early reading interventions targeting one or both of these components are vital, especially during the early years when foundational reading skills are being established.

For students with decoding difficulties, targeted, systematic phonemic awareness and phonics instruction are essential (Brooks 2022; Ehri et al. 2001; Hatcher et al. 2004; National Reading Panel 2000; Shapiro and Solity 2016). Phonemic awareness directly influences decoding skills and is a strong predictor of future reading difficulties (Ehri 2004; Lonigan et al. 2000; Catts et al. 2001; Torgesen 2004). Students with strong phonemic awareness can segment, blend, and manipulate the smallest sounds of speech (phonemes), which supports accurate word reading and spelling. Similarly, letter-sound knowledge – the understanding of the relationship between letters and their corresponding sounds – is essential for fluent decoding. Systematic phonics instruction has been shown to significantly improve reading outcomes by strengthening these skills (Ehri et al. 2001). By addressing both phonemic awareness and letter-sound knowledge through early, targeted intervention, teachers can equip students with the tools needed for long-term reading proficiency.

CORE PRINCIPLES OF THE PREVENTIVE APPROACH TO READING DIFFICULTIES

The preventive approach is grounded in the principle that detecting risk factors—such as dyslexia—at an early stage allows for timely, evidence-based intervention that can improve long-term reading outcomes (Catts and Hogan 2021). Rather than waiting for reading problems to become entrenched, and providing remediation then, this approach prioritises proactive strategies that intensively support the acquisition of foundational reading skills before difficulties escalate. This section explores two key principles of the preventive approach – early identification and evidence-based intervention.

Early identification of children at risk of developing reading difficulties

Research confirms that reading difficulties seldom improve without intervention, and children struggling to learn to read are unlikely to catch up to their peers without substantial, targeted support. One such study, conducted by Juel (1988), tracked the progress of 54 students from Grade 1 through to Grade 4. Her findings indicated that, in most cases, early reading difficulties did not improve over time. In particular, a group of 24 students who had the most difficulty in Grade 1 (scoring at or below the 25th percentile) failed to catch up with their peers by Grade 4. Consequently, the identification of students exhibiting early difficulties is a fundamental component of the preventive approach as it allows for prompt and early intervention (Catts et al. 2015). By assessing students' reading skills as early as preschool or junior infants, teachers can identify those who may be at risk for later reading difficulties (Catts et al. 2001; 2015; O'Connor and Jenkins 1999).

Universal screening helps teachers identify students at risk of developing reading difficulties before they become significant challenges. Effective screening should evaluate key foundational reading skills, including phonemic awareness, letter-sound knowledge, rapid automatic naming, and basic decoding abilities. Ideally, screenings occur during a child's first two years of school at three key points: the beginning, middle, and end of the academic year. These assessments are administered to all students in the class, regardless of their perceived reading proficiency. Screening all students ensures that no child with potential reading difficulties is overlooked, including those who may not exhibit obvious signs of struggle. Designed to be quick and efficient, they typically take around 10 to 15 minutes and can now be self-administered using digital devices. The collected data is then analysed to identify students who are struggling to acquire foundational reading skills despite receiving instruction. It is important to note that universal screening does not diagnose dyslexia but rather flags students experiencing difficulties, allowing for targeted interventions to support their learning needs.

Ethical Implications and Limitations of Early Screening

While early universal screening offers significant benefits, it also raises ethical concerns and potential limitations that must be considered. One issue is labelling and stigma, as identifying students as struggling readers too early could create a self-fulfilling prophecy, where lower expectations from teachers, parents, or even the student themselves reinforce difficulties rather than resolve them (Elliott and Grigorenko 2024). Another concern is the inherent imprecision of screening assessments. Due to measurement error and the evolving nature of reading as a developing

skill, no screening tool can achieve perfect accuracy. Consequently, there is always a trade-off between over-identification (false positives) and under-identification (false negatives) in early screening (White & Schatschneider, 2023). Furthermore, a student's reading ability cannot be fully captured by a single assessment at one point in time. Therefore, incorporating teacher observations and professional judgment is essential in forming a comprehensive evaluation of a child's early reading development. To maximise accuracy and effectiveness, universal screeners must be supported by strong evidence of validity and reliability and implemented alongside policies that ensure all students have access to high-quality early reading instruction.

The Importance of Early, Evidence-Based Reading Intervention

In a preventive approach, early identification of reading difficulties must be tied to effective intervention. Over the past three decades, extensive research has highlighted the significant benefits of early, intensive, evidence-based reading interventions (Solari et al. 2021). Multiple meta-analyses have investigated the effects of reading interventions on word reading outcomes among young children with reading difficulties and have consistently indicated that interventions incorporating components of phonemic awareness and letter-sound knowledge yield superior results compared to those lacking these critical elements (Donegan and Wanzek 2021; Gersten et al. 2020; Hall et al. 2023; Neitzel et al. 2022; Slavin et al. 2011; Suggate 2016; Wanzek et al. 2016, 2018). One such landmark study by the *National Early Literacy Panel* (NELP) (2008) synthesised data from approximately 300 studies and found that early interventions targeting phonemic awareness, letter-sound knowledge, and oral language skills significantly enhanced students' reading development. Their findings highlighted that children who received structured support in these foundational skills were better prepared to overcome reading challenges as they progressed through school.

Research has consistently demonstrated that interventions are most effective when implemented as early as possible during the first years of formal schooling (Connor et al. 2014; Lovett et al. 2017; Ozernov-Palichik and Gaab, 2016). Lovett et al. (2017) conducted a comprehensive study that explored the impact of early intervention programmes on reading outcomes for struggling readers. The study conducted a multi-component, small-group reading intervention for students in Grades 1, 2, and 3. They compared the reading performance of students who participated in the intervention to grade-level control groups who did not receive it. The results showed that children who underwent the intervention outperformed their peers in the control groups. Notably, students who received the intervention earlier (in Grades 1 or 2) demonstrated nearly double the reading gains compared to those who received it in Grade 3. Furthermore, follow-up assessments conducted 1 to 3 years later confirmed that the benefits of early intervention persisted over time.

A preventive approach also emphasises the importance of delivering instruction in a systematic and explicit manner, ensuring that foundational reading skills are taught in a clear, structured, and sequential way. By following a carefully planned sequence of lessons, teachers can build students' skills progressively, supporting automaticity in key foundational skills. Explicit instruction involves direct teaching of these concepts with clear modelling, guided practice, and immediate feedback. The systematic and explicit nature of this instruction is crucial for students struggling to acquire early reading skills (Al Otaiba et al. 2019). Furthermore, interventions aimed at children with reading difficulties should take place in addition to, as opposed to in place of, classroom instruction with teaching in intensive groups mirroring that which is taught in the classroom setting.

Finally, the preventive approach advocates continuous and regular monitoring of identified students' progress in reading as this allows teachers to adjust instruction and ensure the intervention being implemented is effective. In summary, the preventive approach to reading difficulties focuses on early identification and timely, targeted intervention to foster successful reading development. By prioritising these key principles, teachers can create a learning environment that not only addresses the needs of at-risk students but also promotes equitable reading opportunities for all.

Limitations within Early Reading Intervention Research

One limitation in early reading intervention research is the lack of clear evidence on whether one-to-one instruction or small group instruction leads to better reading outcomes for students (Wanzek et al., 2018). The existing literature presents some inconsistencies, with certain studies (Slavin et al. 2011; Neitzel et al. 2021) reporting larger effect sizes for one-to-one instruction compared to small group instruction. However, findings from the *National Reading Panel* meta-analysis (2000) suggest that phonemic awareness instruction is more effective in small group settings than in one-to-one contexts. Similarly, Miles et al. (2022) found no clear differences in reading progress between students who received the Reading Rescue intervention (Ehri et al., 2007; Miles et al., 2018) in either one-to-one or small group settings. Given these mixed findings and the limited research on this topic, further studies are needed to directly compare the effectiveness of small group and one-to-one instruction using the same intervention programme. Notably, one-to-one instruction is highly resource-intensive, and if small group instruction produces comparable outcomes, it would represent a more efficient and scalable approach to reading intervention.

CURRENT APPROACHES TO ADDRESSING READING DIFFICULTIES IN IRELAND

Ireland consistently ranks among the top-performing countries in international reading assessments, as demonstrated by the most recent results from *Progress in International Reading Literacy Study* (PIRLS) (Mullis et al. 2023). However, national data paint a more concerning picture regarding literacy disparities within the country. The 2021 *National Assessments of Mathematics and English Reading* (NAMER) revealed that 24.4% of second-class students perform at or below Level 1 in reading (Kiniry et al. 2023). Even more critically, this figure rises to 43.2% in urban DEIS (*Delivering Equality of Opportunity in Schools*) schools, which primarily serve students from lower socioeconomic backgrounds (Nelis and Gilleece 2023). These statistics suggest that while Ireland performs well overall, significant literacy gaps persist, particularly among lower socioeconomic communities, highlighting the need for a paradigm shift toward more preventive approaches to reading difficulties.

At present, the *Continuum of Support Model* (CoS) (DoE 2007) serves as the primary framework for supporting students with learning difficulties in Irish mainstream schools. While this model emphasises inclusion, equity, and individualised instruction, its effectiveness is heavily dependent on early identification and timely intervention. Currently, many children experiencing reading difficulties do not receive targeted support until their second year of formal schooling, yet research consistently highlights that early intervention—ideally in junior infants—is crucial for students with word reading difficulties (Connor et al. 2014; Lovett et al. 2017). By delaying intervention, the Irish system risks missing a crucial developmental window, increasing the likelihood of persistent reading difficulties that become progressively harder to remediate. This approach not only impacts academic performance but can also undermine students' confidence and motivation to read.

Recognising the importance of early reading development, Irish education policies have highlighted the need to move toward a more preventive approach. The *Literacy and Numeracy for Learning and Life* strategy (DES 2011) acknowledged the urgency of early identification and intervention, stating that intervening at the senior infant stage 'may be too late for many children' and recommended that support should be provided as early as junior infants (DES 2011, p. 49). However, more than a decade later, full implementation of these recommendations remains inconsistent, with many schools still operating on a reactive basis rather than integrating structured, preventive interventions.

To truly embed a preventive approach within the Irish education system, several key reforms are necessary:

1. Integrate universal screening within the Continuum of Support Model – Universal screening should be embedded within the Continuum of Support model to ensure early identification of reading difficulties. Regular screening, alongside teacher observations, will help identify students at risk and provide targeted support before difficulties escalate.
2. Ensure access to evidence-based instruction at all levels – High-quality, systematic instruction in phonemic awareness and phonics should be implemented across all tiers of the Continuum of Support. This includes whole-class instruction at the Classroom Support level, targeted small-group interventions at the School Support level, and intensive, individualised support at the School Support Plus level for students with persistent difficulties.
3. Resource allocation – Schools should be equipped with sufficient resources, including access to screening tools, appropriate intervention programmes, and ongoing professional development in preventive approaches to reading difficulties.

CHALLENGES IN IMPLEMENTING A PREVENTIVE APPROACH

Implementing a preventive approach presents several challenges, including inconsistent application across schools, time constraints, limited professional development, and the need for system-wide coordination. Variability in teacher knowledge, resources, and school policies can lead to disparities in universal screening and early intervention, making equitable support difficult to achieve. Time constraints in classrooms make it challenging to integrate screening and targeted interventions, as teachers must balance early support in reading with broader curriculum demands. Limited instructional time also makes it difficult to schedule individualised or small-group interventions, potentially leading to inconsistent implementation and reduced effectiveness. Additionally, teachers may lack sufficient training in the implementation of universal screening and/or targeted interventions. Finally, a coordinated effort between all stakeholders is essential, as without clear national guidelines, validated screening tools, and adequate funding, schools may struggle to implement high-quality, consistent early reading support. Addressing these challenges requires a sustained commitment to evidence-based practices, adequate resourcing, and system-wide collaboration to ensure that all students receive the early support they need to develop strong foundational reading skills.

CONCLUSION

To fully embed a preventive approach within the education system, a paradigm shift is required—one that prioritises early intervention driven by proactive identification as the cornerstone of reading support. This transformation demands a coordinated commitment from policymakers, teachers, and support services to establish clear, evidence-based guidelines, invest in comprehensive teacher professional development, and ensure equitable access to necessary high-quality resources. By adopting this preventive approach, schools can move beyond reactive, remedial interventions and instead build a more inclusive, sustainable system that empowers all students to achieve long-term reading success.

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THE EMERGENCE OF UNIVERSAL DESIGN FOR LEARNING (UDL) IN IRISH CURRICULA AS AN APPROACH TO INCLUSIVE EDUCATION IN THE REPUBLIC OF IRELAND.

Universal Design for Learning (UDL) is a relatively new concept in early childhood, primary, and post-primary education in Ireland (Flood and Banks, 2021). Efforts to embed UDL in learning and teaching in further and higher education are more established due to the work of the Association of Higher Education and Disability (AHEAD) and the training authority SOLAS in supporting educators develop inclusive practices in response to increasing diverse student populations. The momentum has been slower outside of this arena. However, there is evidence of progress, in particular the work of the NCSE (2019; 2024) in researching UDL in practice internationally as part of a model of full inclusion. This paper explores Ireland's inclusion trajectory and it's evolving thinking around UDL through an exploration of UDL's emergence in Irish curriculum.

Keywords: Universal Design for Learning, inclusion, early-childhood, primary, post-primary, curriculum

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INTRODUCTION

The launch of the National Council for Special Education's (NCSE) progress report "Policy Advice for Special Schools and Classes: An Inclusive Education for an Inclusive Society" (NCSE, 2019) was a watershed moment in Irish education. In this moment, the NCSE highlighted Ireland's educational commitments, and failures, relating to the United Nations Convention on the Rights of Persons with Disability (UNCRPD, 2006), specifically Article 24 while putting forward an early vision for a model of full inclusion in Ireland. Universal Design for Learning (UDL) was recommended as a framework to support this model of full inclusion with the then Minister for Education endorsing this model.

The arrival of Covid-19 in 2020 impacted the publication timeline of the NCSE's subsequent Policy Advice Report and the Pilot School Inclusion Model. However, the Covid-19 pandemic propelled education systems around the world, including Ireland, into new virtual and in-person learning and teaching environments creating the conditions for more in-depth exploration of UDL by educators at all levels (Bray et al, 2020).The arrival of Ukrainian children into Irish education settings created more need for flexibility in our approaches to learning, teaching and assessment to ensure safe, equitable, inclusive and meaningful access and participation in their learning. These two events led to significant changes at government level in how we teach with evidence of UDL applied to the processes and resources being created to support parents, teachers and students. "An Inclusive Education for an Inclusive Society. Policy Advice Paper on Special Schools and Classes" (NCSE, 2024) saw UDL named as the best practice approach to inclusive education with recommendations for embedding it in schools and professional learning programmes.

With this now explicit government focus on UDL, it is important to have an understanding of the evolution of UDL thinking in Ireland. This paper explores this thinking through the lens of curriculum design, primarily examining national curriculum and guidance documents developed by the National Council for Curriculum and Assessment (NCCA) It begins with offering a policy context for the introduction of UDL into Irish education. An overview of UDL and the UDL Guidelines is given before considering UDL as an inclusive pedagogical approach. From here the paper moves to an examination of the use of UDL concepts and language within Irish curricula, signposting its emergence, particularly since the Framework for Junior Cycle (Department of Education, 2015). Following this examination, consideration of the benefits and challenges of Ireland's more active engagement with UDL are discussed.

DEFINING EQUITY AND INCLUSIVE EDUCATION IN IRELAND

Equity, in the context of education and society, remains a multifaceted concept that lacks a universally agreed-upon definition. Diverse viewpoints exist on what equity entails, and in Ireland a single, national definition is not available. The NCSE (2010) underscores the interplay of equity and excellence within a broader discourse on inclusion yet refrains from providing an autonomous definition. UNESCO, however, offers a distinctive perspective by characterising equity as "ensuring that there is a concern with fairness, such that the education of all learners is seen as being of equal importance" (UNESCO, 2017, p. 8). This definition explains equity as an ongoing process aimed at identifying and dismantling barriers that engender inequalities in access to resources and means, and the attainment of fair treatment and equal opportunities to thrive in education and society. Ultimately, equity seeks to foster fairness and parity in education and society as a whole, positioning itself as the antithesis of ableism. Thus, equity in education remains fundamentally intertwined with the principles of inclusion and inclusive education, thereby emphasising the inextricable connection between equity, fairness, and social justice.

Like equity, inclusive education is a continually evolving concept at national and international levels. There has been an increasing emphasis in literature, research and policy advice on the need for education to be founded on principles of social justice and equity, granting every individual equal access and equitable participation opportunities - (Chardin and Novak, 2021; Fovet, 2020; NCSE, 2010; 2019). The central objective of inclusive education is to prepare every student for meaningful engagement in life while facilitating them in realising their full potential in accordance with their unique capabilities, needs and learning goals. Of particular note in this evolving concept of inclusive education is that it has transitioned from solely addressing students with Special Education Needs (SEN) and disabilities to encompassing a broader diversity of learners who might face marginalisation, exclusion or underachievement due to various factors, such as disability, race, gender, sexuality, ethnicity, language, socio-economic background, and geographic location. This understanding of equity and inclusion as a change in the system to one that values diversity (UNESCO 2020; Ainscow, 2024). It reframes how we think about fairness in terms of access, participation and achievement and therefore what is required to reduce barriers to these for students (Ainscow, 2024; CAST, 2024).

In the context of the Irish education system, inclusion can be defined as a dynamic process of

- "Addressing and responding to the diversity and needs of learners through enabling participation in learning, cultures and communities, and
- Removing barriers to education through the accommodation and provision of appropriate structures and arrangements, to enable each learner to achieve the maximum benefit from his/her attendance at school." (NCSE, 2010, p. 39)

These definitions align with the language and intent of the UDL guidelines in that they all focus on the process of inclusion, acknowledging and celebrating diversity, identifying and removing barriers to learning, and presence, participation and achievement for every student. This focus ensures that the principles of fairness and social justice in the education of every student are central to inclusive learning, teaching and assessment practices.

POLICY CONTEXT

Historically, in Ireland, inclusive education has been predominantly viewed through a special education lens, focusing on students with SEN and disabilities. However, in recent years, there has been a growing recognition that the concept of inclusion needs to be broadened to encompass the rich diversity of students in Irish classrooms today. As with special education, Ireland's commitment to inclusion in a diverse society reflect the global human rights agenda. The UN Declaration of Human Rights (UNDHR) (1948) serves as a foundational document for promoting equality and non-discrimination on the basis of race, sex, language, religion, and various other attributes. It provides a guiding framework for creating a just and inclusive society, which is without distinction. Specific to the education global agenda, Goal 4 'Education Quality' (SDG4) of the United Nations Sustainable Development Goals aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all," eliminating all education discrimination by 2030 (United Nations, 2015, p. 19).

In Ireland, one of the most significant legislative steps towards building a diverse and inclusive society is the Equal Status Acts (Government of Ireland, 2000-2018). These Acts are designed to prevent discrimination in various aspects of society, including education, accommodation, and access to goods and services. The nine protected grounds under these Acts encompass gender, race, religion, sexual orientation, family status, marital status, disability, age, and membership of the Traveller community. The core objectives of the Equal Status Acts include promoting equality, prohibiting discrimination (with some limited exemptions), prohibiting harassment and victimisation, requiring reasonable accommodations for persons with disabilities, and promoting a range of positive action measures. The

Education Act (Government of Ireland, 1998), predating the Equal Status Acts, emphasises the need for inclusion and equality in education. Section 7 of the Act states that the Minister for Education "must ensure that there is made available to each person resident in the State……, including a person with a disability or who has other special educational needs, support services and a level and quality of education appropriate to meeting the needs and abilities of that person." In line with legislation, the Irish government has taken steps to align its education policies with the principles of inclusion and equity, with the Department of Education's "Statement of Strategy 2023-2025" (Department of Education, 2023) goal 2 building on previous actions to "ensure equity of opportunity in education and that all children and young people are supported to fulfil their potential" and develop "an education system that welcomes every child and young person and meets their educational needs irrespective of background or ability" (Department of Education, 2023, p. 12).

The Education for Persons with Special Educational Needs (EPSEN) Act of 2004 (Government of Ireland) is a key milestone in Ireland's inclusive education journey. It marked a significant shift from general education legislation that included provisions for children with SEN to a specific legislative framework for students with SEN. The EPSEN Act redefined SEN to encompass any condition that affects a person's learning. It firmly advocated for inclusive education, stating that children with SEN should be educated in inclusive environments alongside their mainstream peers, unless this is inconsistent with the best interests of the child or their typically developing peers. The EPSEN Act (2004) was considered a coherent framework for legislation and policy on inclusive education for students with SEN (NCSE, 2011a). However, in 2022 the Irish Government set out a review process of EPSEN "to provide assurance that the law that governs the provision of education for children with special educational needs is adequate." (Government of Ireland, 2022, p. 2).

The EPSEN Act also expanded the role of the NCSE, established as an independent statutory body in 2003. This body was tasked with improving the delivery of education services to individuals with SEN, particularly children. As School-Self-Evaluation (SSE) (Department of Education, 2022) became a standard practice in schools, the NCSE aimed to provide resources to enable schools to reflect on their inclusive practices within this framework. In 2005 the General Allocation Model (GAM) was introduced to support the development of inclusive schools. GAM was based on a medical model, allocating additional resources to schools to provide provision for students with different categories of needs as set out in the model. The Inclusive Education Framework (NCSE, 2011b aimed to guide schools on best practices for including students with SEN. It emphasised the principles of whole-school community ownership, reflective of pupil diversity, supporting engagement, embedded in ongoing whole-school planning, and evidence and practice-based decision-making. The new Special Education Teacher Allocation model (Department of Education,2017) moved away from a medical model of allocation. This new model gave schools the autonomy to use their allocated resources in a manner that best met the needs of their students and school community, indicating a more flexible student-focused approach to SEN support.

In 2019, the NCSE published an interim report on special classes and special schools in Ireland, highlighting several key points. These include the ideal but challenging goal of educating every student alongside their peers in mainstream classes, the varying views on full inclusion in mainstream classes, the importance of keeping students' educational placements under regular review, concerns about challenging behaviour, the shortage of therapy supports in mainstream schools impacting the rate of enrolment in special schools and classes, and the need for teachers to have appropriate professional learning opportunities to cater to the diverse needs of their students. This report also outlined the NCSE's exploration of New Brunswick's, Canada model for full inclusion based on the principles of UDL and response to intervention. The New Brunswick model takes a broad definition of inclusion that clarifies that "inclusion is not just about students with disabilities; rather, it is about designing to address the variability and diverse needs of every student" (Aucoin, Porter and Baker-Korotkov, 2020, p6). The model is based on three interdependent principles that directly influence professional practice.

1. Public education is universal – The provincial curriculum is delivered equitably to all students within an inclusive, shared learning environment alongside their age-appropriate peers from the local community.
2. Public education is individualised – Each student's success is influenced by how well their education aligns with their best interests, responding to their unique strengths and needs.
3. Public education is adaptable and responsive to change – ensuring it evolves to meet the diverse and shifting needs of learners (Government of New Brunswick, 2009).

By employing a tiered model of support, similar to Ireland's Continuum of Support, UDL serves as the foundation for their best practice framework in promoting inclusive education.

"An Inclusive Education for an Inclusive Society Policy Advice Paper on Special Schools and Classes" (NCSE, 2024) built on the 2019 interim report with explicit reference and recommendations regarding UDL as an approach to inclusive education for schools, teacher education programmes, teacher support services and curriculum designers. While the

title implies this policy advice is aimed solely at special schools and classes, on reading this document it becomes clear that this policy advice affects all schools and educators. The NCSE recommends that relevant partners work with NCSE to develop and deliver a cohesive professional learning programme to enhance mainstream and special education teacher, school leaders and Special Needs Assistants (SNA) knowledge, skills and practice to support the education of students with special educational needs in an inclusive system. This programme should be a continuum of professional learning to support staff throughout their career in school (NCSE, 2024). Additionally, NCSE recommends that UDL principles be embedded in teacher professional learning. The policy advice further recommends that the NCSE work with Teacher Education Section and other professional learning organisations

- "to develop a co-ordinated whole-school professional development programme for all teachers and school staff in inclusion, UDL and disability awareness;
- to work with and provide funding in a coordinated manner to NCSE and the other organisations and services that provide TPL and to make available and deliver a programme of professional learning opportunities for school staff based on school need that includes:
  - Professional learning for school leaders in developing, leading and managing inclusive schools, informed by UDL;
  - Continuous TPL in inclusion and UDL to enhance the capacity of teachers to teach all students." (NCSE, 2024, p. 122)

In addition to this focus on professional learning in inclusion, UDL and disability awareness, this policy advice recommend that the Department of Education and the NCCA "to examine and, if necessary, review curriculum frameworks and content at preschool, primary, and post-primary levels to ensure that curriculums at all three levels are underpinned by a UDL approach" (NCSE, 2024, p. 125).

WHAT IS UNIVERSAL DESIGN FOR LEARNING

UDL is a comprehensive approach to education that proactively caters to the diverse identities, skills, learning strengths, and needs of all students, aiming to enhance student engagement and academic success. The overarching goal of UDL is to "support learner agency, the capacity to actively participate in making choices in service of learning goals" (CAST, 2024). The capacity of students to act as effective agents is linked to their learning community and how it is structured and the extent to which all voices, regardless of perceived status, are recognised, valued and can contribute in meaningful ways (Restani, 2021). Creating learning environments that foster this agency involves continuously examining power dynamics, challenging the notion of the educator as the sole authority, and providing space for students to make sense of content through independent and collective engagement and reflection. Moreover, supporting student agency requires acknowledging cultural and identity dimensions and addressing biases that may hinder learners from fully exercising their agency. UDL aims to redesign the environment to remove barriers, ensuring that every learner can engage in rigorous and meaningful learning. Thus, for UDL to be effective, it adopts a student-centred approach, emphasising multi-directional interactions between the student, context, teacher, curriculum, and both cognitive and emotional aspects (Meyer, Rose and Gordon, 2014) with the aim to address the barriers in the learning environment rather than attempting to 'fix' the student.

THE UDL GUIDELINES 3.0

The UDL Guidelines 3.0 (CAST, 2024) (Figure 1) are a tool to support the enactment of the principles of UDL to meet the learning needs of every student. UDL consists of the three core principles of UDL for providing choice and flexibility in how learning, teaching, and assessment is designed and occurs. Identity is threaded throughout the three principles.

- Multiple means of Engagement: designing multiple ways for students to engage with their learning through creating curiosity for learning, making learning relevant in an environment where students can be their authentic selves, and sustaining students' efforts and motivation to learn.
- Multiple Means of Representation: designing multiple ways of presenting information to ensure students have equitable access to the content. This involves creating flexible content and materials for students to interact with, ensuring shared understanding, and activating, developing, and generalising knowledge and understanding. It also entails acknowledging and respecting how individuals, cultures, collective and personal identities, viewpoints, and ways of understanding are represented within the content. It is where students should see themselves and see others within the content.
- Multiple Means of Action and Expression: designing multiple ways for students to express and demonstrate their knowledge, understanding, values, and skills through varying the methods and tools for students'

communication and construction of work, guiding goal setting and planning, and facilitating students' self-reflection and self-monitoring of their work.

Each principle has three guidelines that provide recommendations for increasing students' access to the learning goal, supporting the learning process, and supporting students executive functioning. Each guideline has associated considerations that offer more detailed suggestions for teachers on how to provide choice and flexibility within each principle. It is important that these considerations are used contextually and as part of a continuum of UDL enactment. They are not intended to be used a linear checklist. The UDL Guidelines 3.0 is intended to provide "a structure for proactively uncovering and addressing these barriers and for intentionally designing learning environments and experiences that more fully honour and value every learner" (CAST, 2024).

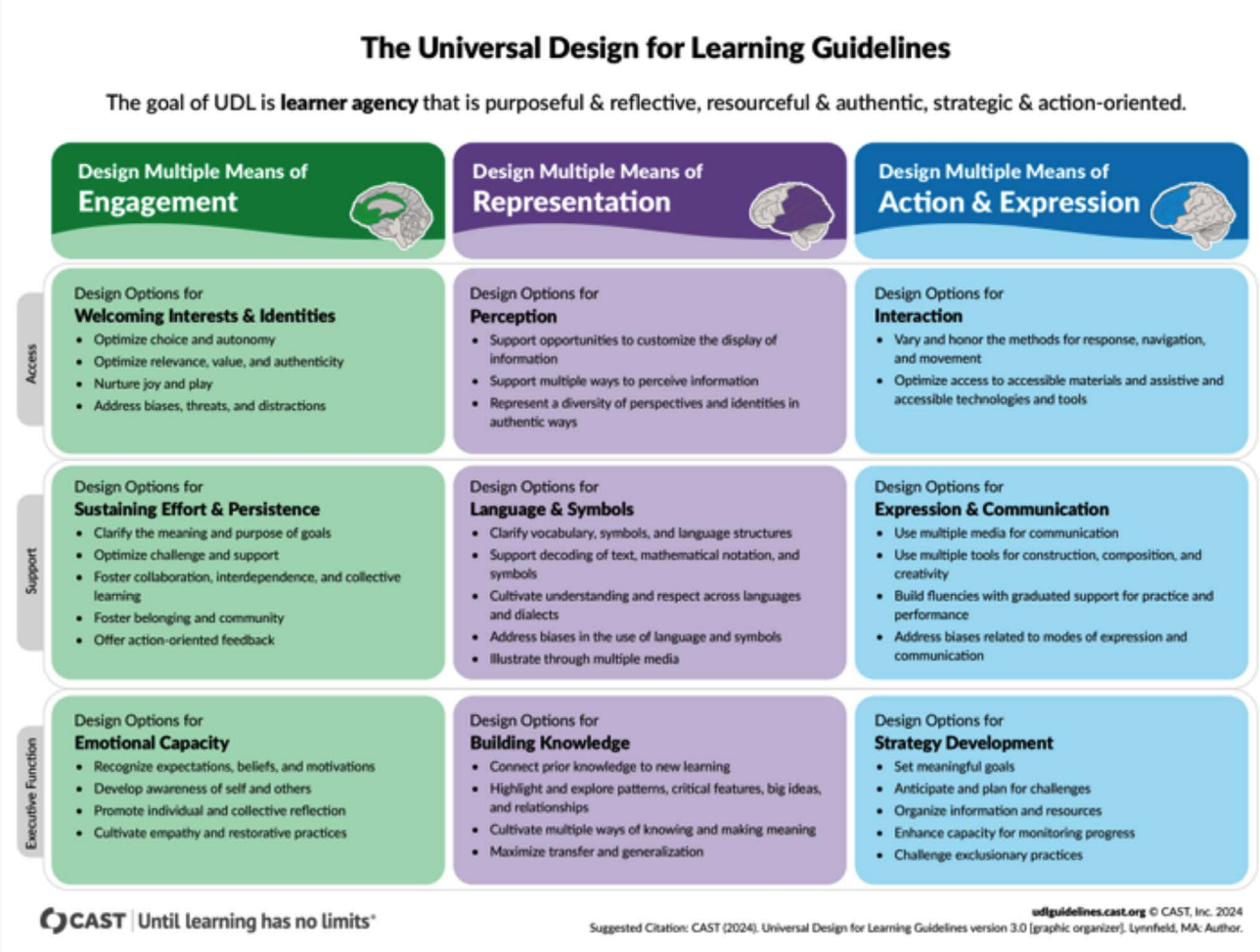


Figure 1. The Universal Design for Learning Guidelines. (CAST, 2024)

UNIVERSAL DESIGN FOR LEARNING AS AN INCLUSIVE PEDAGOGY

Universal Design for Learning (UDL) exists at the intersection of equity, diversity, and inclusion (EDI), social justice, and accessibility. In a world where systemic and societal barriers prevent individuals from reaching their full potential, it is crucial to scrutinise our teaching methods, tools, and materials. This ensures that our approaches and content minimise biases related to identity, race, culture, language, gender, disability, or class, which can restrict access, participation, engagement, and success. UDL is a strategy specifically created to tackle and diminish these inequities by eliminating barriers for all students (Chardin and Novak, 2021). Based on the concept of neurodiversity, UDL has developed from a framework for the inclusion of students with SEN and disability to one aspires to celebrate and respond to the variability of every student by reducing biases and systemic barriers that that result in inequitable learning opportunities and outcomes.. This is evident in the newest version of the UDL Guidelines 3.0 (CAST, 2024) that were designed to address seven key themes of equity (CAST Collaborative notes, 2021) that closely align with Ireland's Equal Status Acts (2000-2018); race and ethnicity, gender and sexuality, socio-economic status, language, disability, citizenship and nationality, and identity and stereotypes.

THE EMERGENCE OF UDL IN CURRICULUM DESIGN

UDL is a relatively new concept in early childhood, primary, and post-primary education in Ireland (Flood and Banks, 2021). However, efforts to integrate UDL into further and higher education are more advanced, thanks to the work of the Association of Higher Education and Disability (AHEAD) and the training authority SOLAS, which support educators in developing inclusive practices for increasingly diverse student populations. Progress has been slower in other areas, but there are signs of advancement, particularly through the NCSE researching UDL practices internationally as part of a full inclusion model (NCSE, 2019) and making explicit recommendation regarding taking a UDL to inclusion in schools and embedding in in professional learning programmes (NCSE, 2024).

Furthermore, as legislation develops around diversity, equity and inclusive education government bodies are tasked with providing advice, guidelines, and directives to educators to achieve inclusive education. Over the past three decades, the Department of Education's statutory body for curriculum design, the NCCA's, approach to inclusive curriculum design has evolved significantly. The NCCA's 1999 paper, "Special Educational Needs: Curriculum Issues," laid the groundwork for future developments in curriculum access for students with SEN (NCCA, 2016). Key terms from this paper, such as 'pathways,' 'individualised programmes,' 'continuum of provision,' and 'whole-school approach,' have become staples in subsequent NCCA and NCSE documents on SEN. The paper highlighted that the principles guiding education for students with SEN and disability are the same as those for all students (NCCA, 2016). These principles continue to be central to the NCCA's curriculum review and design processes. However, the NCCA faces the ongoing challenge of integrating new insights and approaches to inclusion, learning, teaching, and assessment into the Irish education context. This is reflected in the evolving language and methods in NCCA reviews, frameworks, specifications, and guidelines, including "Encountering Children in a Curriculum for Education about Religions and Beliefs (ERB) and Ethics- A Review", " (NCCA, 2015, "Guidelines for Teachers of Students with General Learning Disabilities" (NCCA, 2007), "Guidelines for Exceptionally Able Students" (NCCA, 2007a), "Intercultural Guidelines" (2006),"Guidelines: supporting teaching and learning in care and detention schools" (NCCA, 2023a) and "Traveller culture and history research report" (2023b).Additionally, the NCCA's ongoing work on Wellbeing and Relationships and Sexuality Education (RSE) (2021a) has brought attention to sexual and gender identity within the inclusion dialogue. While global progress of SDG4 is slower than hoped (United Nations, 2024), these strategies indicate that Ireland is addressing educational disparities and working towards providing equal access to education for persons with disabilities, indigenous and minority groups, and vulnerable learners.

In the last decade the NCCA has also embedded UDL principles from previous UDL Guidelines iterations within curriculum designs, emphasising equality, then equity, and inclusion since the launch of the Framework for Junior Cycle (FJC) (Department of Education, 2015). This framework introduced broad and balanced learning outcomes, which have influenced the Primary Language Curriculum (PLC) (Department of Education 2019), the Primary Mathemathics Curriculum (PMC) (Department of Education, 2023c), and the Primary Curriculum Framework (Department of Education, 2023d). Learning outcomes are also a feature of recent Senior Cycle specification developments. Additionally, the Aistear Framework (NCCA, 2009) employs broad learning goals similar to learning outcomes, making all recent curriculum specifications outcome based.

The connection of these learning outcomes to student expectations highlights UDL's role in inclusive curriculum design. These outcomes express the principles, statements, and skills/competencies underpinning various frameworks. Their flexible design allows teachers to adapt and teach content in ways that suit their school's and students' contexts. Flexible pathways within curriculum frameworks further align with UDL principles. The Junior Cycle (Figure 2) provides a variety of options for students and teachers, allowing for a customizable approach to education. This includes subjects, short courses, Level 2 Learning Programmes (L2LPs) for students with mild to moderate learning disabilities, and Level 1 Learning Programmes (L1LPs) for students with moderate to severe learning disabilities. These programmes aim to help most students achieve their learning outcomes within mainstream classrooms, although many L1LP students attend special schools.

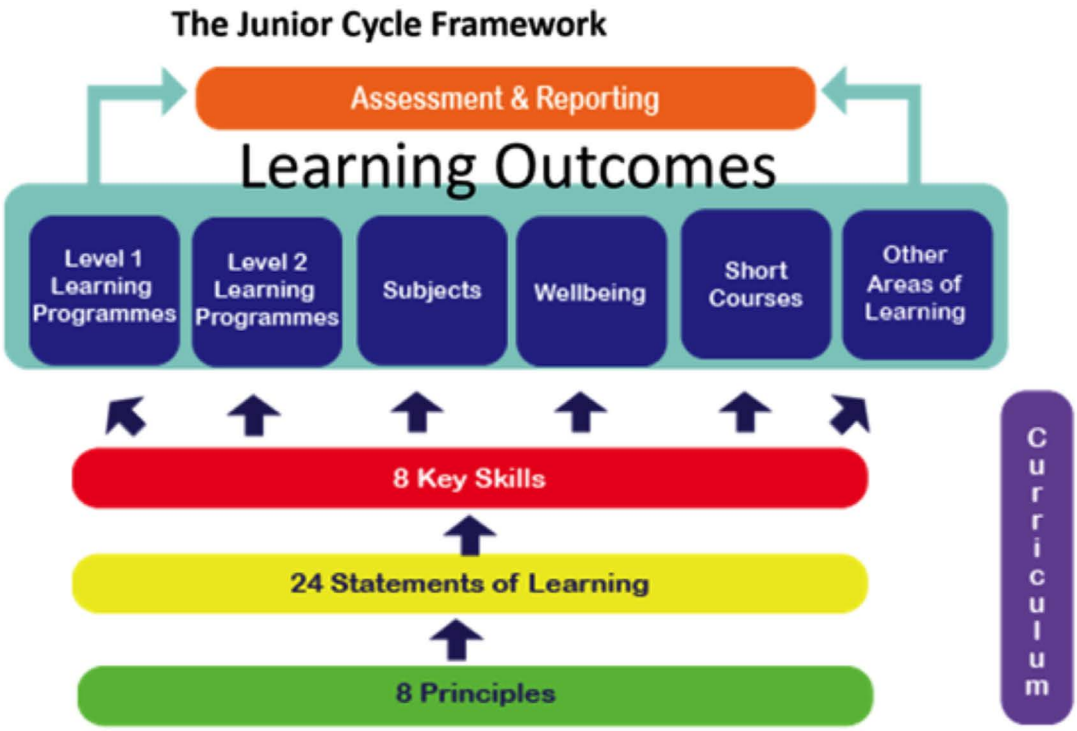
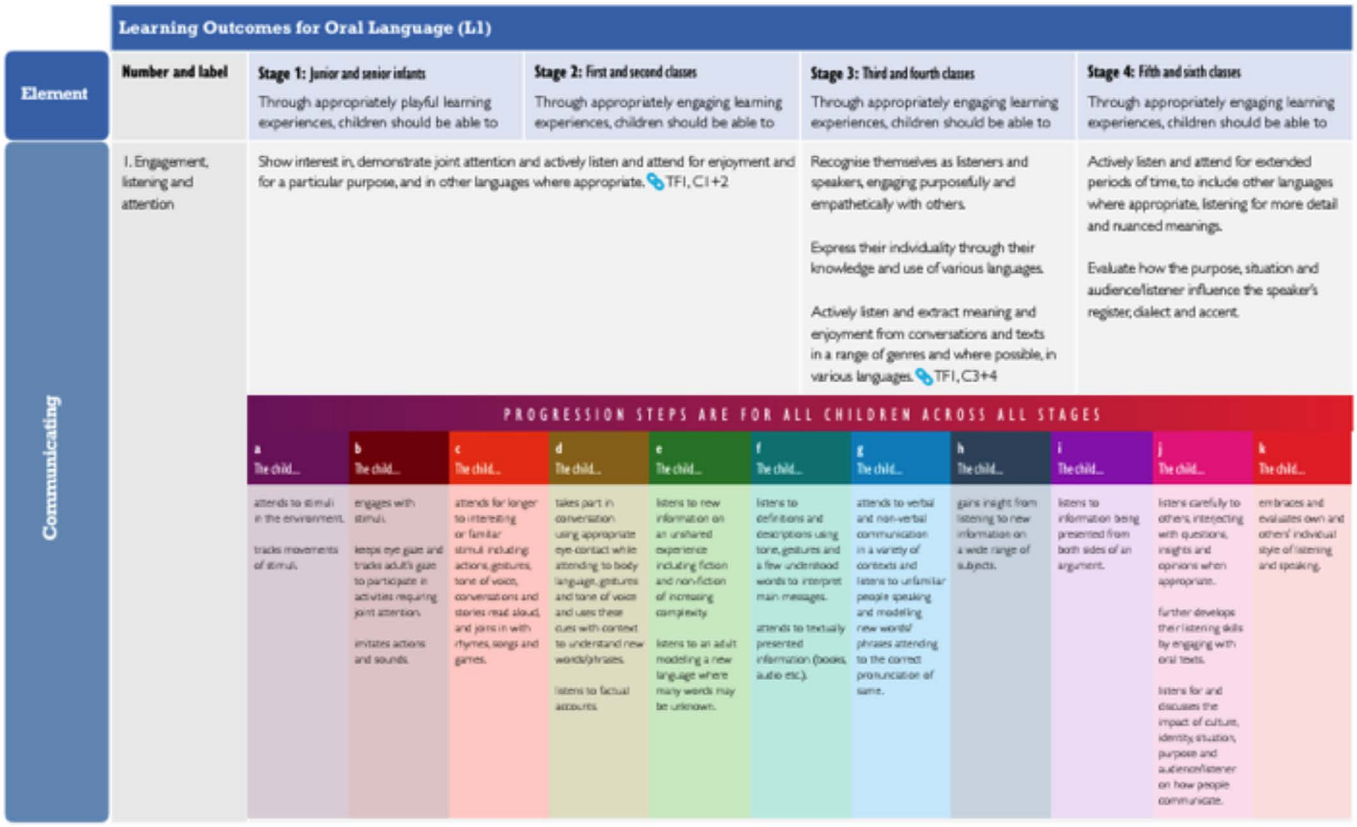


Figure 2: Junior Cyle Framework (Junior Cycle for Teachers (JCT), 2015)

The PLC and PMC have further advanced this inclusive learning strategy. Instead of offering separate programmes, they ensure all students have access to a common curriculum through the development of their Progression Continua (Figure 3), supporting each student's progress towards their learning goals.



Learning Outcomes for Oral Language (L1)

Element	Number and label	Stage 1: Junior and senior infants	Stage 2: First and second classes	Stage 3: Third and fourth classes	Stage 4: Fifth and sixth classes
		Through appropriately playful learning experiences, children should be able to	Through appropriately engaging learning experiences, children should be able to	Through appropriately engaging learning experiences, children should be able to	Through appropriately engaging learning experiences, children should be able to
Communicating	1. Engagement, listening and attention	Show interest in, demonstrate joint attention and actively listen and attend for enjoyment and for a particular purpose, and in other languages where appropriate. TFI, CI+2		Recognise themselves as listeners and speakers, engaging purposefully and empathetically with others. Express their individuality through their knowledge and use of various languages. Actively listen and extract meaning and enjoyment from conversations and texts in a range of genres and where possible, in various languages. TFI, C3+4	Actively listen and attend for extended periods of time, to include other languages where appropriate, listening for more detail and nuanced meanings. Evaluate how the purpose, situation and audience/listener influence the speaker's register, dialect and accent.

PROGRESSION STEPS ARE FOR ALL CHILDREN ACROSS ALL STAGES

a The child...	b The child...	c The child...	d The child...	e The child...	f The child...	g The child...	h The child...	i The child...	j The child...	k The child...
attends to stimuli in the environment. tracks movements of stimuli.	engages with stimuli. keeps eye gaze and tracks adult's gaze to participate in activities requiring joint attention. imitates actions and sounds.	attends for longer to interesting or familiar stimuli including actions, gestures, tone of voice, conversations and stories read aloud, and joins in with rhymes, songs and games.	takes part in conversation using appropriate eye-contact while attending to body language, gestures and tone of voice and uses these cues with context to understand new words/phrases. listens to factual accounts.	listens to new information on an unshared experience including fiction and non-fiction of increasing complexity. listens to an adult modelling a new language where many words may be unknown.	listens to definitions and descriptions using tone, gestures and a few understood words to interpret main messages. attends to textually presented information (books, audio etc.).	attends to verbal and non-verbal communication in a variety of contexts and listens to unfamiliar people speaking and modelling new words/phrases attending to the correct pronunciation of same.	gains insight from listening to new information on a wide range of subjects.	listens to information being presented from both sides of an argument.	listens carefully to others, interjecting with questions, insights and opinions when appropriate. further develops their listening skills by engaging with oral texts. listens for and discusses the impact of culture, identity, situation, purpose and audience/listener on how people communicate.	embraces and evaluates own and others' individual style of listening and speaking.

Figure 3. Progression Continua PLC. Oral Language example (NCCA, 2019, p6)

UDL is even more evident in the PMC's support materials of the "Primary Mathematics Curriculum" (NCCA, 2023c) (Figure 4) where the language of UDL is threaded through the support material with the key considerations and practical to support and promote inclusive, teaching and assessing aligned to the three UDL principles and the guidelines and checkpoints of The UDL Guidelines 2.2 (CAST, 2018).

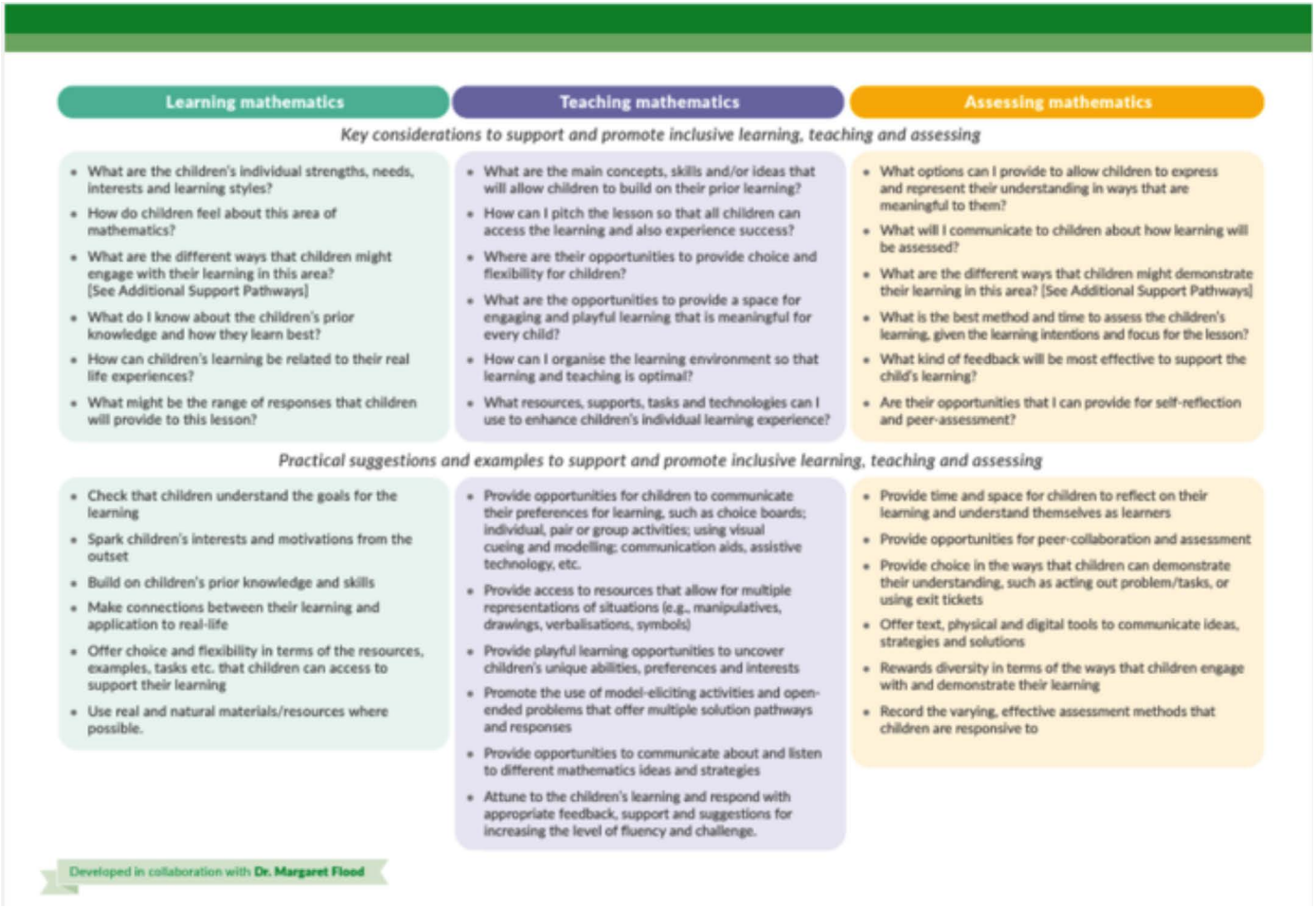


Figure 4. Key considerations and examples to support and promote inclusive learning, teaching and assessing (NCCA, 2023c, p. 2)

The principles of equity, inclusion, and Universal Design for Learning (UDL) are evident in the ongoing review and redevelopment of programmes and documents. The Advisory Report on the Senior Cycle Review (NCCA, 2021b) emphasises flexibility and choice. A guiding principle of proposed key competencies for senior cycle, inclusive education and diversity, states that "The educational experience in senior cycle is inclusive of every student, valuing and respecting diversity and the contribution each student can make. Every student has enjoyable experiences in and meaningful outcomes from senior cycle education" (NCCA, 2023e p.114). There is however still reference to differentiation in specification documents (NCCA, 2023e) that form part of the senior cycle review and redesign. The updated guidance for teachers of children in care or detention "Guidelines: Supporting teaching and learning in care and detention schools" (NCCA, 2023a) explicitly underscores UDL as an inclusive approach to learning, teaching, and assessment, aiming to prevent educational disadvantage due to a student's setting.
In tandem with UDL emerging in curriculum design, it also became a consideration for teacher support services, professional learning organisations and initial teacher education providers. JCT, now Oide, incorporated UDL into aspects of their professional learning programmes for schools and teachers (JCT, 2015-2024) and NCSE will be piloting UDL in 45 schools in Ireland, starting September 2025. Furthermore, initial teacher education providers are incorporating UDL into their programmes with universities offering a range of options from micro-credentials in UDL to master's programmes in UDL.

DISCUSSION

Inclusive education in Ireland has evolved from a predominantly special education-focused approach to a broader perspective that acknowledges the diverse needs of students in a diverse society. The country's commitment to human

rights, as outlined in the UN Declaration of Human Rights and enshrined in the Equal Status Acts, has played a crucial role in shaping inclusive education policies. The Department of Education's strategies underscore the commitment to fostering inclusion, promoting equity, and ensuring that no student is educationally disadvantaged, while our national curricula continue to be designed to be more equitable and inclusive for every student. These strategies collectively aim to create an educational environment that celebrates diversity and values the identity of all students, thus contributing to the development of an inclusive society in Ireland. Nonetheless, there remain challenges. Differentiation and UDL are used interchangeably at the micro, meso and macro levels and there appears not to be a shared understanding and messaging of UDL, with government bodies already having to correct publications where UDL has been misrepresented. For example, the NSCE has noted on its website that corrections were made on an earlier version of "Policy Advice Paper on Special Schools and Classes: An Inclusive Education for an Inclusive Society" (NCSE, 2024) to address using UDL, Universal Design (UD), and universal interchangeably and in the incorrect context. (NCSE, 2024).

While this paper signposts where the key concepts of UDL are underpinning recent curriculum developments, these may need to be more explicit if teachers are to be clear on their role in teaching UDL in their learning, teaching and assessment. This raises the question of the government agencies such as the NCCA, NCSE, Oide, and the Inspectorate's, application of UDL to their work and how best to support teachers engage with UDL from the curriculum design process to their practice. However, apart from the efforts of support services such as Oide, professional learning for UDL at early childhood, primary and post-primary to this point is ad hoc with Department of Education funded programmes for teachers still focusing on SEN courses for individual special education teachers rather than the broader lens of inclusion, disability and diversity awareness and UDL available to special and mainstream teachers, or at whole-school level.

There is also the concern with the significant focus put on UDL in 2024 that course providers will add UDL as an additional to course design with no context for the learner. Most importantly, is the publication of the new UDL Guidelines 3.0 (CAST, 2024) which sees significant changes to the previous iteration. This will have an impact on current and immediate programmes being delivered, such as the NCSE UDL pilot programmes. It is crucial that in such cases, educators and facilitators take the time to ensure they understand the new guidelines and how they apply to the Irish context. Thus, in a time when the concept of inclusive education and how to achieve it is so in flux continued dialogues, research, reflection, and policy evolution to realise the goal of inclusive education for all students in Ireland is imperative.

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INCLUSIVE EDUCATION AND PEDAGOGY IN POST-PRIMARY STEM CLASSROOMS

As inclusive education becomes more and more synonymous with general school life it has become increasingly important to establish both the practical meaning and effective implementation of inclusive pedagogy in our classrooms. The overarching goals of inclusive education are grounded in a desire to create more equitable and accommodating societies, but governments face many challenges when it comes to translating these ideals into reality, particularly within the field of Science, Technology, Engineering and Mathematics (STEM).

Post-primary educators in Ireland are trained in generalised differentiation strategies for the purposes of accommodating for all learners. However, it is difficult to ascertain the effectiveness of inclusive pedagogy in improving learning attainment.

The aims of this research project were two-fold: to gather and analyse findings on the general attitudes of post-primary STEM teachers in Ireland towards inclusive education and to gather and analyse findings on inclusive pedagogical practices utilised by post-primary STEM teachers in Ireland.

The overall findings found that the 54 STEM educators who participated in the study held generally positive views towards inclusive education and expressed adequate understanding of its nature and challenges. Several teaching techniques appeared throughout the meta-strategies, which suggested an interchangeability between differentiation, assessment and general inclusion in the minds of the participants. No pedagogical strategies identified in the study were STEM specific.

Keywords: STEM; Science; Inclusive education; Inclusive pedagogy; Evidence-based pedagogy.

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INTRODUCTION AND BACKGROUND

The focus of this article stems from both the researcher's lived experience of post-primary classrooms as a STEM educator and from their understanding of human sociology/psychology. Inclusive education and its learning meta-strategies are central to much of contemporary initial teacher education (Kurth and Foley, 2014). While the ideals of inclusive education are an overarching aim for education systems to strive towards, the researcher has experienced a stark difference in the realities of the classroom versus the theory of generalised classroom inclusion. Macro-level change proposals informed by education research are inclined to disregard the practical challenges of classrooms, particularly in post-primary settings. Time constraints, lack of resources, behaviour management, diversity of learning ability and a broad achievement criteria that do not always pertain to formal learning outcomes are some examples of the challenges that modern educators face (Janssen, Westbroek and Doyle, 2015).

Differentiation, and the utilisation of varying pedagogical techniques, does not solely constitute inclusive STEM education, and there appears to be a disconnect between what are desired qualities in STEM students versus what is achievable for them. Existing literature regarding the area of inclusive education proves very little in terms of its actual efficacy in improving learning attainment at a macro-level (Haug, 2017; Young, McNamara and Coughlan, 2017; Grima-Farrell, Janssen et al., 2015; Bain and McDonagh, 2011).

Currently the research literature is quite limited when analysing the links between inclusion and science education within this context. A recent bibliometric and descriptive analysis of the area concluded that while there has been a quantitative increase in the number of studies conducted in both areas, the majority of articles published relating to science and inclusive education are categorised as special education in terms of research (Waltz Comarú et al., 2021). It is evident when observing the conclusions of research into the area of STEM education that those who experience effective inclusive practices in the classroom tend to achieve higher academically and develop scientific

skills more proficiently (Nasri et al., 2021). However, given that the majority of research articles produced in relation to STEM education and inclusion are treated separately to one another, it is difficult to ascertain if these increased levels of achievement and improved learning outcomes are within the context of special education or in the broader demographics of mainstream classrooms.

The provision for special educational needs (SEN) and general inclusion within Irish education is mandated through several key pieces of legislation; The Education Act (1998), the Education for Persons with Special Educational Needs Act (EPSEN) (2004) and the Education (Admissions to Schools) Act (2018). The majority of western countries have been moving towards fully inclusive education systems over the last number of decades with the aim to improve societal equity (Kivirauma, Klemelä and Rinne, 2006).

While many educational policies have been implemented across the global community to better achieve the ideals of inclusive education, the meaningful progress made has been quite minimal in this area (Walton, 2023). The benefits of inclusive education relating to learning attainment are limited to relatively small-scale studies and common trends appear consistently with regards to the challenges as to why it is not feasible to effectively implement at a system-wide level (Janssen et al., 2015). The National Council for Special Education (NCSE) (2009) has listed the rise of behaviours of concern in young learners, socio-economic inequality and the erosion of national literacy and numeracy as being some of the barriers that have stymied the development of a truly inclusive education system in Ireland.

The importance of this research topic lies in examining effective pedagogy and educational policies that best serve learners of all backgrounds. The current approach of generalised inclusion in classrooms has not provided evidence as to whether it is truly efficacious in providing adequate supports for the learning needs of young people. Examining the realities faced by STEM teachers in schools and developing quantifiable metrics for inclusive learning strategies should be an integral part of all large-scale educational change for policy makers. The experiences of the researcher and interactions with other STEM and non-STEM educators alike would suggest there is a lack of critical analysis towards how pedagogy is deemed effective or efficient. The EPSEN Act is currently being reviewed by the Joint Committee on Disability Matters, a committee of the Oireachtas which monitors the implementation (by Ireland) of the United Nations Convention on the Rights of Persons with Disabilities, but its focus lies on the overall inadequacies of inclusive education in Ireland rather than the specifics of effective inclusive teaching (Joint Committee on Disability Matters, 2023). The provision of quality education for all students is essential to create a more equitable society and to increase the pool of potential candidates for specialised areas of research and employment which require higher levels of learning and cognitive ability.

The research questions that guided this research were:

- What general attitudes do post-primary STEM teachers in the Republic of Ireland hold towards inclusive education and the extent of these attitudes?
- What inclusive pedagogical practices are utilised by post-primary STEM teachers in the Republic of Ireland?

METHODOLOGY

A quantitative approach was taken to data collection for this small-scale study. The researcher utilised a questionnaire as the data-collection instrument. Due to practical limitations, an online questionnaire that individuals could complete in their own time was an ideal approach to gather quantitative empirical data (Wright, 2005). This type of data-collection provides an efficient mechanism to accumulate key information essential to the focus of the overall research questions of the thesis.

Cluster and convenience sampling were conducted for the purposes of data-collection for this study. The schools selected for the clusters differed in terms of educational settings and demographics. They were as follows:

- A single-sex (male) voluntary secondary school with 1100+ students and approximately 70 teaching staff.
- A mixed-sex Education and Training Board school with 1000+ students and approximately 70 teaching staff.
- A mixed-sex Education and Training Board school (Delivering Equality of Opportunity In Schools) with 700+ students and approximately 50 teaching staff.

Quantitative Methods Approach

The questionnaires were distributed digitally via email as a Google Form. Participants gave their consent in writing or through the Google Form questionnaire. The data was then collated and analysed.

The respondents from the questionnaire numbered 54. They were from a larger group of approximately 1000 post-primary STEM educators which were drawn from the Sharing Science Ireland group and a number of post-primary schools in the locality of the author.

The intention and design of the questionnaire was to gather information in relation to the participants' demographics, teaching experience, their qualifications in STEM subjects, current inclusive pedagogical practices they implement and their general views of inclusive education within the field of STEM. It was deemed important by the researcher to gather background information of participants in order to identify any trends that appeared within their views and implementation of inclusive pedagogy within the classroom.
A Likert scale (Likert, 1932) was used in the questionnaire as it allowed the participants to communicate their level of understanding and opinions on key areas within the field of inclusive education with set responses: Strongly disagree, Disagree, Neither Agree nor Disagree, Agree and Strongly Agree. This was an essential aspect of the study as it allowed for the collation of quantifiable ordinal data which was reviewed before having to apply thematic analysis for the qualitative questions.

Ethical Issues and Considerations

A research proposal for this study was submitted and approved by the Hibernia College Ethics Committee prior to commencing the study and the collection of data. This research study complied with the British Educational Research Association (2011) and Hibernia College's ethical guidelines. To summarise:

- No students or persons under the age of eighteen were used in this study.
- Participants were invited to opt in to this research on a voluntary basis.
- Participants were informed of the option to withdraw their participation from the study after eight weeks.
- Participants were informed of how their data would be stored and maintained.
- Participants were informed of their right and ability to access their own data upon request.
- No information or data was gathered that could be used as an identifier for participants.

Prior to the distribution of the online questionnaires, the Principal of each school selected as a cluster for sampling, was approached for the consent of their school to be included in the study.

Potential biases of the researcher were minimised in two ways: through the use of neutral, non-leading language in the survey design and the opting for a quantitative approach to data gathering rather than qualitative interviewing.

Data Analysis

This study's post-positivist research design meant the data gathered from the questionnaires were collated and analysed for any emerging trends with regards to background information of participants and their views/practices of inclusive education within STEM. For meaningful analysis to occur, elements of thematic analysis through categorisation were required in order to be able to better quantify open-ended responses in the survey (Vaughn and Turner, 2016).

The points of agreeability on a Likert scale, utilised for the questionnaire, were numerically metrified by assigning them values. This was carried out in order to establish a measure of validity and robustness within the study's data gathering process. The table below details the numerical values chosen for each point on the Likert scale:

Table 1: Assigned numerical values of Likert Scale Points

Point of Agreeability	Assigned Numerical Value
Strongly Disagree	-2
Disagree	-1
Neither Agree nor Disagree	0
Agree	1
Strongly Agree	2

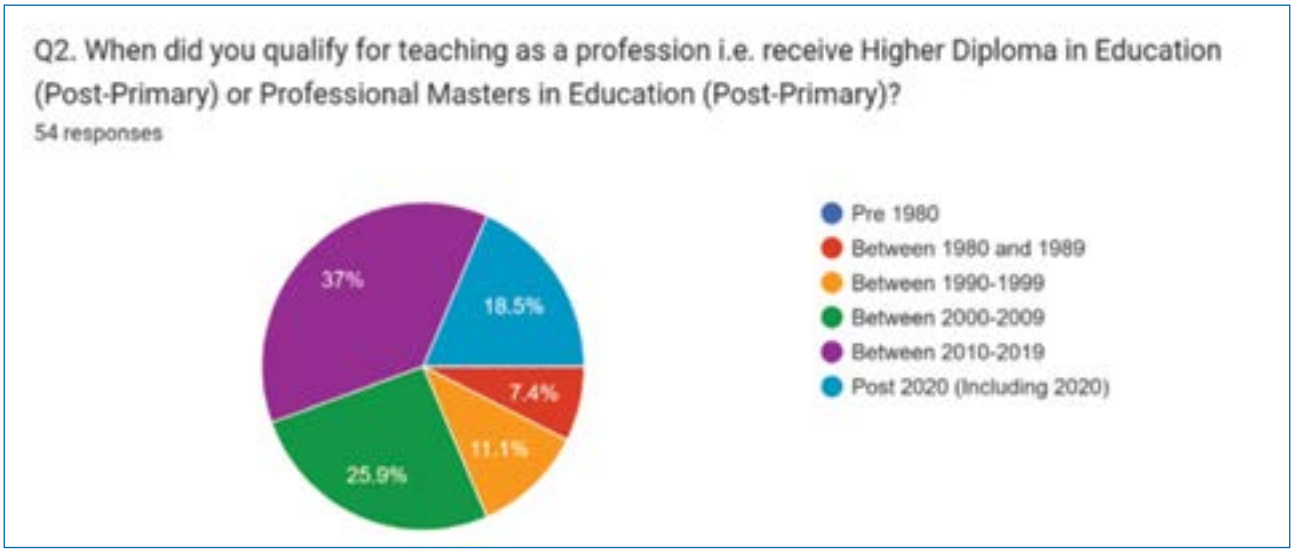
FINDINGS AND DISCUSSION

The study's data was analysed to identify factors that could affect the views and practices of post-primary STEM educators in terms of inclusive education and pedagogy. The study's findings are presented under the following three headings:

- Demographical and background information of participants.
- General views and beliefs regarding inclusive STEM education.
- Implementation of inclusive pedagogy in the STEM classroom.

Several questions within the questionnaire were designed to establish the demographical and background information relating to participants' teaching experience and when they became a qualified post-primary educator. Figure 1 below gives a percentage breakdown of the sample group in terms of when they qualified as professional post-primary teachers.

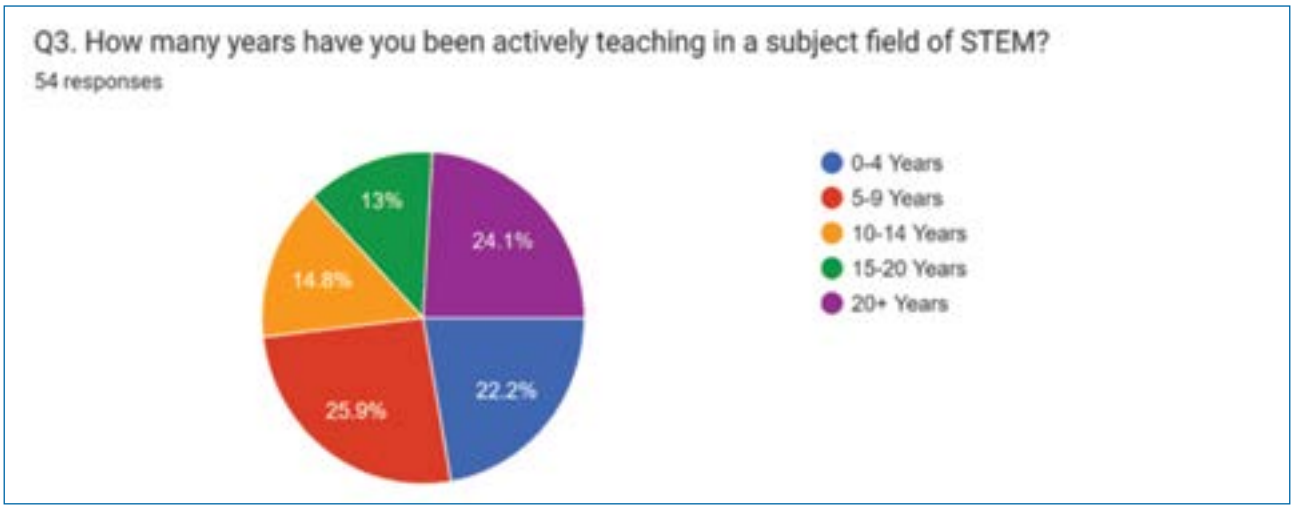
Figure 1: Era of professional teaching qualification.



The key points that were noted were:

- Approximately 20% of participants qualified after 2020.
- Approximately 40% of participants qualified between 2010 and 2019.
- Approximately 25% of participants qualified between 2000 and 2009.
- Less than 20% of participants qualified prior to 2000.
- No participants qualified prior to the year 1980.

Figure 2: Number of years of active teaching of participants in a STEM subject.



Establishing how many years participants had of active teaching in a STEM subject discipline was important, as current research literature suggests it is one of many factors that can affect the views and inclusive practices of educators (Dignat, Rimm-Kaufman, van Ewijk, and Kunter, 2022). Figure 2 displays participants' years of active teaching in a STEM subject. It was observed that approximately:

- 20% of participants had 0-4 years of active STEM teaching experience.
- 25% of participants had 5-9 years of active STEM teaching experience.
- 15% of participants had 10-14 years of active STEM teaching experience.
- 15% of participants had 15-20 years of active STEM teaching experience.
- 25% of participants had 20+ years of active STEM teaching experience.

The statistical functions of Microsoft Excel were used to calculate the mean, sample standard deviation, margin of error and percentage margin of error. Initial impressions were that participants held generally positive attitudes towards inclusion but felt they were not adequately supported to implement inclusive pedagogies effectively. The margins of error were relatively high however (for a 95% confidence interval), which suggested the validity of data may be compromised. Overall, a Mode Score was obtained for the range of the entire data sets but not within certain sub-sets due to the inability to calculate modal values for certain questions. The analysis of the data relating to the overall attitudes of participants towards inclusive education are presented in Table 2.

Table 2: Analytics of participant demographical data and attitudes.

Question	Q7	Q8	Q9	Q10	Q11	Q12
Mode Score	1	1	-1	1	1	1
Mean Score	1.25	1.22	-0.38	0.78	0.58	0.69
Sample Standard Deviation	0.67	0.74	1.01	1.03	1.05	1.08
Margin of Error	0.18	0.20	0.27	0.27	0.28	0.29
Percentage Margin of Error	17.94	19.67	26.91	27.49	27.97	28.77
Z-score	1.96					

Cawley, Hayden, and Baker-Kroczynski (2002) established that significantly high levels of interpersonal contact are established between educators and their students in science-based subjects. It is understandable that the attitudes and beliefs of post-primary teachers have the potential to impact on their students and how they also view STEM. There are also strong links in existing literature between the success of implementing inclusive educational practices and the attitudes of teachers (Varcoe and Boyle, 2013).

A strong general understanding of inclusion within the classroom was evident among the study group, based on the data gathered. Close to 97 percent of the study group indicated that they felt they understood what inclusion meant in the classroom. While it was difficult to determine the exact depth of their understanding with this question alone, it would suggest that the respondents were at least relatively informed regarding this area of education.

One factor that has been linked to poor implementation of inclusive pedagogy has been lack of teacher knowledge and training in the area (Kennedy, 2010), but the results here do not indicate that this was an issue for this sample group. The processed data showed that the sample group did not feel teachers were adequately supported to implement effective inclusive pedagogy in their classrooms (Table 2). While the value of -0.38 would suggest that the sentiment is closer to neutral than to Disagree, there are limitations with this assumption due to the nature of Likert scales. The modal value of -1 gives a better indication of the attitudes of STEM teachers to this aspect of inclusion in the classroom.

The majority of the sample group (81 percent) stated that they qualified as professional post-primary teachers post the year 2000. The statistical breakdown of active teaching experience in their respective STEM subject showed that it was a relatively even distribution of teachers among the sample group. Analysing the responses against these demographical categories showed there was a negative correlation between years of service/era of qualification and general understanding/attitudes towards inclusive education. This aligned with previous studies carried out in relation to the implementation of inclusive pedagogy found that younger, less experienced educators held generally

more positive views towards inclusion in mainstream classrooms, and as a result more effectively utilised inclusive teaching practices (Forlin et al., 2008; Male, 2011).

The analysis of the data gathered from the study group highlighted some interesting facets of the thought processes of STEM educators regarding inclusive pedagogy. The design of the questionnaire in terms of establishing the capacity of and extent to which post-primary STEM teachers employ inclusive pedagogical methods allowed for the collection of descriptive qualitative data. Several themes appeared repeatedly throughout the responses given for separate questions. Regarding methods of differentiation, AFL and general inclusion, it was evident that participants considered them with a degree of interchangeability. The broad categories of questioning, group work, scaffolding and varied learning styles emerged several times throughout the questions relating to pedagogical practices. These were also the most frequently reported techniques that the members of the sample group found most effective in their teaching.

The lack of distinction between the wider meta-strategies in the responses of the sample group harks back to difficulties in clearly defining inclusive education and its practices (Shyman, 2015; McLeskey et al., 2014; Florian, 2014). When there is commonality in techniques within each meta-strategy, it may be reasonable to conclude STEM educators do not view differentiation, AFL and general inclusion differently to any significant extent. Effective teaching in STEM has been found to revolve around the following key principles (Çimer, 2007):

- Assessing prior knowledge.
- Application of knowledge meaningfully.
- Learner engagement.
- Student inquiry.
- Co-operative learning.
- Feedback and continuous assessment.

The categories and themes that emerged from participants' responses in this study largely fall under these principles. A challenge that is inevitable when attempting to define 'effective' teaching lies in the myriad of pedagogical philosophies that dominate education across the global community. An educator's pedagogical practice is heavily influenced by their perspective of teaching and learning (Pratt, 2002). It may be possible that the interchangeability the participants exhibited in relation to differentiation, AFL and general inclusion is linked with the principles of effective STEM teaching. Jansen et al. (2015) has suggested that professional educators who execute teaching efficaciously select their pedagogy based on ease of use in a classroom setting.

CONCLUSION

While the sample group was limited in terms of population, the results did concur with the findings of existing research in the area (Young, McNamara and Coughlan, 2017). Attitudes of the post-primary STEM educators towards inclusive education followed existing trends which suggest teachers hold generally positive views on the ideals of inclusive education but can be concerned about its implementation due to practicalities of the classroom (Young, McNamara and Coughlan, 2017). There were no marked differences between the views of STEM teachers and general educators in the wider literature.

It was observed that participants generally held positive views towards inclusion in the classroom and felt they held adequate understanding of the facets and challenges of inclusive education. There was a slight negative correlation between general attitudes towards inclusive education and years of teaching service; as a teacher gained more teaching experience, they appeared to hold more negative attitudes and reduced understanding towards inclusion within the classroom. This may be explained by the likelihood that teachers who have significant lengths of service in education systems generally develop higher levels of cynicism towards developments and implementation of contemporary education policies (Sau-ching and Moses, 2016). Irish educators hold generally positive views of the ideals of inclusive education but regularly report misgivings about the pragmatics of implementing the full inclusion of students with SEN and behavioural challenges in mainstream classrooms (Young, McNamara and Coughlan, 2017).

The study raised key questions regarding areas of inclusion that schools, education systems and policy makers should aim to address. It is evident that post-primary educators believe that the overall mission of inclusive education is a worthy ideal to strive for in teaching but there is little evidence globally to show that inclusion within classrooms is both happening and having a definitive impact on learning attainment. Specific metrics need to be established for what is considered to be effective inclusive pedagogy, in order to discern what is required to meaningfully improve

educational outcomes for all students (Waltz-Comaru et al, 2021). It may be possible that an overhaul to the approach and philosophies towards inclusive education is required for it to effectively manifest in classrooms.

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FACILITATING ASSISTIVE TECHNOLOGY USE FOR STUDENTS WITH SPECIFIC LEARNING DIFFICULTIES: INSIGHTS FROM IRISH POST-PRIMARY TEACHERS

Digital technologies offer transformative opportunities for students with specific learning difficulties (SpLD). However, there has been limited research on how to effectively use such technology in the classroom to support these learners. This study investigated the experiences of post-primary teachers in Ireland in facilitating the use of assistive technology (AT) for students with SpLD

Semi-structured interviews were conducted with ten Irish post-primary teachers who are experienced in using assistive technology in their classrooms. Reflexive thematic analysis was employed to analyse the data.

From this analysis, three major themes were developed: the impact on students, teaching strategies, and the Irish post-primary education system. Participants identified barriers to technology use for their students and shared practices they had developed to maximize the effectiveness of AT within the constraints of the school environment.

Success factors for utilizing AT include social, psychological, pedagogical, technological, and logistical considerations. Teachers require resources, including national guidance on technology-enhanced pedagogy and sustained learning opportunities including collaboration with peers.

Keywords: assistive technology; specific learning difficulty; post-primary; teacher; Ireland

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INTRODUCTION

Assistive technology has been defined as any product whose main purpose is to "maintain or improve an individual's functioning and independence, and thereby promote their well-being" (World Health Organisation 2025). Assistive technology incorporates devices from low to high tech and is used by people with disabilities in all the settings in which they participate: home, education, community, workplace and public spaces.

In recent years, the rapid development of information technology has led to a blurring of the boundaries between 'assistive' technology (specifically designed for people with disabilities) and technology in general. Functionality created for people with disabilities (for example, text-to-speech) has often proven to have a more general use, and features of general software (spellcheckers, for example) have been transformative for people with disabilities. While some specifically designed assistive technology will always be necessary, the distinction between 'assistive' and other technology is no longer always relevant (AHEAD 2024).

Literacy-supporting technology, both 'assistive' and general, has evolved rapidly in recent years, with an array of tools now available as freeware or as integral features of mainstream software packages, apps and websites. Although such tools are clearly a crucial development in supporting the reading and writing of students with diverse learning needs, the nuances of their implementation in the classroom remain under-researched internationally and particularly in an Irish context. This study presents an exploratory investigation into the classroom experience of Irish post-primary teachers working with literacy-supporting assistive technology with students with SpLD.

Reading and writing skills are known to be key determinants, not only of academic performance but also of wider life outcomes (Mulcahy *et al.* 2016). Developing students' reading and writing skills is therefore one of the most essential functions of schooling. Individuals whose development of reading and writing skills is hindered by dyslexia or other learning difficulties often experience poorer educational opportunities and outcomes, along with associated negative emotional and life impacts. If technology can help reduce these inequalities, educators must understand how and in what situations it can be most effectively used for their students' benefit.

For students with specific learning difficulties, such as dyslexia and dysgraphia, assistive technology (AT), and in particular text-to-speech (TTS) and speech-to-text (STT) software would appear to offer transformative affordances. Students no longer need to be slowed down by the processes of decoding words or working out spellings, but can have the technology perform these tasks instantly, leaving them free to concentrate on higher-order aspects of text reception and production (Almgren Bäck *et al.* 2023).

Research has demonstrated the realisation of some clear benefits of technology use for students with SpLD. For students with intellectual disabilities (ID), and those with neurodiverse conditions such as autism, a range of technological tools have been shown to benefit students' literacy development, in addition to their social, emotional and behavioural development, particularly when used as part of a focused educational programme (Stanger *et al.* 2016; Pontikas *et al.* 2020).

Several recent meta-analyses have reviewed the research to date on the effectiveness of AT for students with SpLD. Wood *et al.* (2018) examined the impact of text-to-speech application on students' reading comprehension and identified a generally positive effect, but with significant variance. The researchers called for a greater understanding of moderating variables. A very similar conclusion was reached by Alanazi and Abdulkader (2024), while Raffoul and Jaber (2023), in a North American study, found gains in self-efficacy and learning independence for students using TTS as well as improved reading comprehension.

Research on speech-to-text (STT) applications for students with learning disabilities is sparser but has also shown some positive results. STT has been shown to improve writing performance, particularly for students with more severe SpLD (Matre and Cameron 2024) methodological approaches, and major findings of studies on the use of STT among secondary pupils (age 12–18). Some students using this technology have been able to produce longer, higher-quality and more accurate writing (Perelmutter *et al.* 2017). Students' speed in producing text may also be increased (Almgren Bäck *et al.* 2023) and initial resistance to writing decreased (Matre 2022).

Although it was noted early in the development of these technologies that they came with challenges as well as benefits for school-based application (Biancarosa and Griffiths 2012), surprisingly little attention has been given to this aspect. Recent research from Sweden, however, has noted a gap in the literature on 'how interventions should be designed in an applied school setting' (Nordström *et al.* 2019) and has demonstrated the complexity of factors affecting student benefits from TTS and STT. Moderating factors identified in this and other international research include time allocation and teacher training (Ahmed 2018; Atanga *et al.* 2020), integration of technology with student learning strategies (Almgren Bäck *et al.* 2023), students' emotional response to the technology (Svensson *et al.* 2021) and aspects of the school environment (Almgren Bäck *et al.* 2023).

In an Irish context, Feerick, Clerkin and Cosgrove (2022) call for a strengthening of teachers' understanding of the concept of 'embedding' technology throughout the curriculum. The Department of Education's consultation for its Digital Strategy for Schools (2022) reported teacher calls for 'more guidance and advice on pedagogical strategies for using assistive technology with learners who have special educational needs (SEN) and managing devices in the classroom for these learners with SEN rather than just focusing on tools'. This research project takes a current sample of the pedagogical and practical strategies being developed by teachers in their daily classroom practice and the factors impacting the optimal adoption of digital technologies for these students.

METHOD

The study aimed to examine Irish post-primary teachers' experiences of student use of assistive technology to support reading and writing, to identify some of the barriers to most effective technology use for students with SpLD and to describe aspects of effective practices developed by teachers.

An application for ethical approval was made to the Ethics Committee at Munster Technological University, outlining arrangements for informed consent for participants and secure, password-protected data storage. Following the granting of ethical approval two months later (HREC-MR-23-014), participants were recruited. Informed written consent was obtained through a participant information sheet and consent form.

PARTICIPANTS

The project required participants with strong interest and experience in using AT with their students and with rich insight into this area. For this reason, purposive sampling was employed. Initially, teachers who had participated in AT training through the SOAR project for access to higher education were targeted. This project has provided AT training to teachers across Munster, and project workers from participating universities have developed strong networks

with second-level teachers. These networks were used to recruit research participants with significant interest and experience in facilitating AT use in their professional practice. Participant numbers were then increased through snowball sampling.

A total of 10 teachers were interviewed from six different schools. Two teachers had a mainstream subject teaching role, two worked purely in SEN, and six had a joint role. One teacher was additionally a member of their school's senior management team. Two participants were male and eight were female.

PROCEDURE

A semi-structured interview procedure was followed. Participants were asked about their experience of using assistive technology to support the reading and writing skills of students with SEN. No further definition of 'assistive technology' was provided and teachers were allowed to interpret this in whatever way they chose. While a set of guide questions provided the basic interview structure (see Appendix A), participants were allowed and encouraged to expand on areas of particular interest to them. Interviews were recorded and transcribed using the software Otter.ai. After exporting transcripts, all data was deleted from Otter and transcripts were stored in a secure location.

Data analysis was carried out using Reflexive Thematic Analysis (Braun and Clarke 2019). RTA represents a refinement of Braun and Clarke's highly influential paper (2006) on Thematic Analysis to better align the method with 'big Q' qualitative research paradigms. RTA was selected for this project for its suitability for the exploratory and open-ended nature of the research.

Data analysis in RTA engages the subjectivity of the researcher as an integral part of the analysis rather than a bias to be eliminated. Themes are explicitly recognised as a creation of the researcher rather than something pre-existing and 'emerging from' the data. The data analysis process is therefore a long and iterative process through which the researcher develops 'creative and interpretive *stories* about the data' (Braun and Clarke 2019) rather than seeking a single 'correct' interpretation.

Analysis followed the six phases of RTA: immersive reading and re-reading of transcripts, generating codes, constructing themes, reviewing potential themes, defining and naming themes, and producing the report. The app Readwise Reader was used to manage the coding process.

RESULTS

Participants mentioned a relatively small range of technologies for supporting students with reading and writing difficulties. Text-to-speech and speech-to-text features built into word processing packages were most commonly mentioned: Immersive Reader and Dictate on MS Word, and Voice Typing on Google Docs. The voice recognition software Dragon Naturally Speaking and the text-to-speech app Natural Reader were mentioned by one teacher only. Most participants also spoke of general features of basic software packages which have been particularly helpful for students with SEN: keyboarding vs handwriting, and the sharing of files and resources on platforms such as OneNote.

Theme 1: Impact on students

Sub-theme 1: Participation, achievement and motivation

Access to information, particularly for homework, was emphasised by most participants as a key digital affordance for students with SEN. While file-sharing platforms such as OneNote are not generally considered 'assistive' technology, these were identified by SEN and subject teachers alike as a key technological development for students with learning difficulties. Students can use these platforms to access both course content in multimedia formats and also teachers' instructions regarding homework tasks. Compared with a school environment where these must all be laboriously written down by students, this was seen by many participants as an important facilitator for students whose handwriting may be too slow to keep pace with their daily needs in the classroom.

Similarly, the simple use of word-processing applications as opposed to handwriting was seen as a key support for students with SEN. Some teachers found that students were more motivated to write using a laptop or computer than with pen and paper. They also noted the relative ease of integrating word processing into a mainstream classroom environment where other students are handwriting.

The importance of basic word processing for students with SpLD as opposed to more specific 'assistive' technology has been noted in several international studies (Perelmutter *et al.* 2017; Weigelt-Marom and Weintraub 2018)

Most participants mentioned fatigue reduction as a significant benefit of technology use for students with learning difficulties. With the right tools, teachers found that students were '*able to engage more and for longer in school, in the school day because they're using technology, and they're able to complete their homework faster and they don't get as drained.' [P2].*

Some feedback received from parents also showed an improvement in stamina and engagement in the context of homework '*So what we were finding was calling parents and them saying, "Oh my gosh, she was sitting down last night for an hour. She has not done that before for her English"' [P2].*

Beyond improvements in the school experience, however, one teacher emphasised the fact that for some students, it is only through technology use that they can participate at all in the processes of schooling. It is indispensable for any kind of engagement with the curriculum.

Many participants had observed in their AT-using students, an awareness that they were developing IT skills that would become important in later life. These students showed pride in their equipment and abilities. In some cases, teachers tapped into this motivation by setting up peer mentoring arrangements with younger students, providing still further positive affirmation for these students.

These positive impacts of AT observed by Irish teachers echo findings in international research: increased motivation and stamina for schoolwork (Svensson *et al.* 2021), the experience of success, independence (Nordström *et al.* 2019) TTS and speech-to-text, STT functions and reduction in resistance to writing (Almgren Bäck *et al.* 2023).

Sub-theme 2: Not wanting to stand out

All participants mentioned 'not wanting to be different' as an impediment to AT use for students with learning difficulties. Many of these students already feel uncomfortable due to their learning difficulties, and using a laptop in the classroom often reinforces this feeling. These students '*worry more about friendships than anything else*' *[P7]* and are often reluctant to use their 'different' devices or even to be seen carrying them to class.

Some participants identified specific groups of students particularly affected by the social impact of AT. One felt that girls were more affected than boys, and several felt that younger students were more reluctant than older students. Students who had used technology through primary school and those who had transitioned from other technology-rich post-primary schools were more likely to be comfortable using it.

Student feelings about their technology appear to be one of the main factors influencing its successful application, and a variety of motivations need to be considered.

> *So, it's quite a spectrum… you've students who are extremely comfortable, with their device and quite proud of it. …. And then there are students who have to be encouraged to have the device…. They don't want to be known as being different and they don't want students saying, 'How come you're using that? What's wrong?' [P6].*

Theme 2: Teaching strategies

Sub-theme 1: Managing Attitudes to AT

Participants were all very conscious of the potential social risk to students of using AT and all mentioned efforts to manage this aspect. Teachers described several approaches to easing the social discomfort many students experience around AT use.

Teachers spoke of the need to be sensitive to students' feelings and to be discreet and diplomatic in introducing technological supports. Several spoke of 'normalising' technology use and the importance of all staff using positive language around the use of laptops in school. Introducing the technology gently and over time was also felt to be important.

A strategy that most participants had found successful was to integrate technology use within whole-class work, teaching technology-enabled strategies such as self-editing as a universal and mainstream activity. This approach enabled students with learning difficulties to benefit from the technology and the learning strategy in the same way as their peers.

Peer mentoring was another strategy that some teachers had found effective, particularly in getting over emotional barriers and promoting positive attitudes.

Sub-theme 2: Integrating Learning Strategies

The most effective use of technology to support student learning is not necessarily self-evident and requires teaching. This was emphasised by most participants. Effective teaching involves not simply the operation of the software but, more importantly, its role in a broader learning objective. This finding was one of the main themes in a Swedish five-year follow-up study on AT use in schools (Almgren Bäck *et al.* 2023). The study strongly emphasised the need to provide ongoing support and guidance to students on meaningful strategies to enhance text comprehension and production.

Some participants had addressed this by modelling their own use of appropriate technology in classes. Others had developed various strategies for integrating AT through trial and error or their experience and teaching instincts. Most, though, felt that they and their colleagues were under-supported in this area, both in terms of time and training. This appears to be a common experience internationally for teachers working in this rapidly developing area (Nordström *et al.* 2019; Atanga *et al.* 2020)TTS and speech-to-text, STT functions

Much more research is required on the integration of assistive technology and teaching methods. Participants' calls for this echo teachers' concerns identified in the consultation for the Digital Strategy for Schools (Department of Education 2022).

Sub-theme 3: Time needed for individual guidance

The need for ongoing individual guidance from teachers has been emphasised in the literature (Nordström *et al.* 2019) TTS and speech-to-text, STT functions. Irish teachers also felt strongly that much more time needed to be allocated to help students individually with assistive technology. Students vary greatly in terms of literacy profiles, motivations and personal preferences, and teachers felt that significant time was needed to support students to select and learn to use the most appropriate tools.

Students being offered assistive technology are more likely than others to have a negative previous experience of school, and teachers stated that these students may require greater support and persuasion to take on a new learning task.

Communication with parents, other teachers and SNAs about individual students was seen as necessary but difficult to manage within the constraints of the school week.

Theme 3: Irish Second-level system

Sub-theme 1: The School Environment

The busyness of the post-primary school week leaves little time for teachers to provide the individual technical and learning support needed by AT-using students.

While some of students' support needs can be dealt with more easily in small group settings, teachers found text-to-speech and speech-to-text largely unusable for students in mainstream classes. Many mentioned homework as an area where these technologies could be used more effectively, but this was very much dependent on students' motivation and parental support.

Physical infrastructure was another area in which teachers found challenges. Enormously complex and lengthy bureaucratic processes are often required to access appropriate devices for students. Some teachers reported significant negative consequences of these delays to the point where the potential benefit of the technology is lost: '*They either learn to cope, or they get themselves in trouble in school because they were struggling learners anyway…you can lose them very quickly' [P2].*

Sub-theme 2: Impact of State Exams

All participants emphasised the impact of exams as a major factor affecting decisions around assistive technology: *'The fact that the Leaving Cert is a handwritten exam, we're finding that a big, big stumbling block for us' [P10].*

The bureaucratic procedure for enabling a student's use of technology in State exams is long and time-consuming, and until this is complete, teachers do not know what supports, if any, their students will be allowed. This process can be protracted, leaving students and teachers in limbo regarding technology use and potentially losing a critical period for establishing effective learning practices.

Additionally, some teachers felt that the pull of exams left too little time to focus on developing students' independent reading skills. Rather than allowing students to read and process information at their own pace, teachers felt under

pressure to fast-track students' route to information by pre-digesting text in a variety of ways*: 'We spend so much time trying to organise the information further, pulling out keywords and we're always highlighting and then practising questions and things' [P6].*

Sub-theme 3: Leadership

The importance of leadership, within the school and externally, was emphasised by many participants. A whole-school approach to assistive technology had been supported by school managers through whole-staff Continuous Professional Development (CPD) events, additional training events and in one case, the provision of a post of responsibility for AT.

Some teachers, however, felt that a deeper, more sustained approach was necessary, providing scheduled time for collaboration to develop their expertise. They called for the Department of Education to support this developmental work rather than simply one-off training sessions.

DISCUSSION

This study was an initial and exploratory investigation into an under-researched area. While considerable experimental research has been carried out on the impact of AT on students, little field-based research is available on the application of AT within the specific context of the post-primary school.

Although the study is small in scale, representing only six post-primary schools in the Munster region, many of its findings align strongly with international research and begin to answer the question of moderating variables raised in several meta-analyses.

Teachers in this study were generally positive about technology's potential for students with SpLD, aligning with limited prior research (Perelmutter et al. 2017; Weigelt-Marom & Weintraub 2018). Notably, word processing instead of handwriting was considered key for many students. This merits greater attention.

Specialist tools like STT and TTS can help reduce the burden of reading and writing, but pose logistical challenges in mainstream classes. Several barriers hinder effective AT use, including State exams that exclude digital literacy, the prioritisation of information learning over literacy development, and bureaucratic delays in the RACE scheme. Classroom constraints, staff availability, and fragmented schedules further limit AT adoption.

Students' emotional response to technology influences uptake, emphasising the need to normalise AT use across schools. More research is needed on integrating technology into teaching, alongside a national strategy for sustained teacher training. Bureaucratic obstacles must be reduced to ensure timely AT adoption.

Modern literacy skills are essential for all students. The long-overdue Leaving Certificate reform must address digital literacy, particularly for those struggling with reading and writing.

IMPLICATIONS FOR PRACTICE

Recommendations for Teachers

AT adoption works most effectively where the use of technology in classes is normalised as far as possible. Empowering and inclusive language should be used consistently by all staff members and technology embedded in teaching, where possible, as a universal tool rather than a disability-specific support. Basic word processing and the use of file-sharing apps may be very significant supports for students with learning disabilities. Technology-inclusive learning strategies, such as the self-editing of writing support for all students and are essential skills for post-school life.

When students are asked to use technology individually, this should be introduced with care for the student's feelings and the social/psychological impacts considered along with educational goals. Peer mentoring may be a helpful way to reduce resistance.

A networked approach is essential to support student AT use with subject teachers, SEN teachers, and SNAs in constant communication. Ongoing communication with parents is also crucial to support students' use of AT outside the classroom. These networks should be prioritised as far as time allows.

Recommendations for School Management

AT adoption works most effectively where a whole school approach is taken to student use of technology. Staff need training and, even more importantly, time allocation for establishing effective practice in this area. Infrastructure needs to be made available by default.

Recommendations for Department of Education

Time allocation should be made available to schools to develop effective AT use. Further research is required on the integration of AT with pedagogy in the context of the Irish second-level system. Schools should be provided with clear national guidance based on the outcomes of this, including guidance on the selection of hardware, software, and apps.

CONCLUSION

Digital technology is developing rapidly and offers real opportunities for greater equity and achievement for students with specific learning difficulties. Ensuring that Irish students will gain maximum benefit from this development will entail a coherent national effort, including research, sustained teacher learning initiatives, easing of bureaucratic hold-ups and the inclusion of more modern digital literacy practices as part of the State exams system.

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APPENDIX A

Interview Schedule

- Please describe your school and your teaching role.
- What AT have you used in school to help your students with reading and/or writing?
- What positive impacts of AT use have you observed in your students?
- Are there any negative impacts of AT use on your students?
- What are the challenges faced by teachers wanting to facilitate AT?
- How has your use of AT in the classroom developed over time? What factors have driven changes in this?
- Can you think of a specific example of when AT has helped in your teaching? Please describe the situation, how you introduced the technology and the impact you observed.
- Do you find students keen to use technology to support their learning? If so, what helps to encourage them? If not, why do you think this is?
- What for you are the key factors in helpful AT use in education?
- What are some of the difficulties around AT use in education? How should these be dealt with?
- How do you manage AT continuity between SEN withdrawal classes and mainstream subject classes?
- How do you support students to use AT with their homework?
- Is there anything else you would like to add?

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