

How can Universal Design for Learning (UDL) Principles Inform the Development of Neuroinclusive Vocal Pedagogy for AuDHD Singers?

Katie Hogan
2333703

Word Count

7003

Table of Contents

Component 1 - Project Portfolio.....	2
Introduction.....	2
Planned Programme of Study.....	3
Context and Rationale.....	3
Aims and Objectives.....	4
Expected Learning Outcomes.....	5
Planned Activities, Methodologies, and Timescales.....	5
Methodology.....	6
Rationale.....	6
Search Strategy and Source Selection.....	7
Data Charting, Synthesis, and Reflexivity.....	9
Component Two - Project Report.....	10
Introduction.....	10
Review.....	12
Universal Design for Learning as a Pedagogical Design Framework.....	12
UDL and Neurodivergence.....	14
UDL in Music Education and Voice Pedagogy.....	15
Narrative Synthesis: Towards a Neuroinclusive Vocal Pedagogy.....	15
Regulation as a Pedagogical Foundation For Vocal Learning.....	16
Embodied Meaning-Making and Multimodal Access.....	17
Relational Design within the Voice Studio.....	17
Structured Autonomy and Flexible Development Pathways.....	18
From Responsive Teaching to Anticipatory Studio Design.....	19
Implications, limitations, and future directions.....	19
Critical reflection.....	21
Disruption of prior pedagogical assumptions.....	21
Emotional, ethical, and neurodivergent reflexivity.....	22
Reframing authority, power, and pedagogical responsibility.....	22
Practitioner-Researcher Identity and Developmental Trajectory.....	23
Limits of reflection and ongoing criticality.....	23
Conclusion.....	24
References.....	26
Appendices.....	31
Appendix A: Overview of Sensitising Themes Informing the Review.....	31
Appendix A1: Visual Map of Sensitising Themes.....	33
Appendix B: UDL Guidelines 3.0 Graphic Organiser (CAST, 2024).....	34
Appendix C: Database Search Strategies.....	35
Appendix D: Inclusion and Exclusion Criteria.....	37
Appendix E: Screening and Selection Process.....	39

Component 1 - Project Portfolio

Introduction

In my previous assignment, I conducted a participatory research study exploring the learning preferences of adult singing students who experienced both autistic and ADHD traits (AuDHD). In particular, this study investigated how participants responded to imagery-based and technical modes of explanation. The results revealed more than just a preference for hybrid explanations, instead highlighting that accessible learning was facilitated through learning environments that provided emotional safety, multimodal explanations, opportunities for embodied cognition, and structured autonomy. Whilst these findings were reflected in my natural teaching style, they exposed a critical limitation within my practice - I lacked an intentional and repeatable framework through which I could design the learning environment. Instead I relied on “reflection-in-action” methods (Schon, 1983) and experiential sensitivity as a fellow AuDHD individual in order to respond to learner variability as it arose.

Universal Design for Learning (UDL) is a pedagogical framework that had garnered my attention during the analysis of my findings and, as such, was presented in my recommendations as a potentially valuable pedagogical lens through which to develop my teaching from intuitive inclusivity towards anticipatory learning design. UDL aims to facilitate access to learning by redesigning the learning environment itself, rather than addressing learning differences through outdated deficit-based accommodations (Cumming and Rose, 2022; CAST, 2024).

My initial searches on UDL-focused literature marked a notable absence of literature that addressed the intersection of UDL, neurodivergence, and voice pedagogy (Moxness, 2023; Accardo *et al.*, 2025). This study therefore aims to explore how UDL is interpreted and actioned across multidisciplinary literature, and how it might inform the development of a neuro-affirming and inclusive voice pedagogy for AuDHD singing students.

Planned Programme of Study

Context and Rationale

UDL is a design-focused framework that is grounded in inclusive education research, cognitive psychology, and disability studies (CAST, 2024). UDL positions learner variability as a normal attribute within student cohorts and promotes the construction of environments that support access to learning through its three core principles: multiple means of engagement, representation, and action and expression (Waitoller and King Thorius, 2016; Hamilton and Petty, 2023; CAST, 2024). Within inclusive education research, UDL is often positioned alongside neuro-affirming and disability studies that the deficit-based model of learning differences and shift the burden of access from the learner to the learning environment (Podlucká, 2020; Hamilton and Petty, 2023).

Education research that addresses autistic and ADHD learners consistently highlights the need for emotional safety, sensory considerations, predictability, and learner agency and its impact on pedagogical design (Mercé Barrera Ciurana *et al.*, 2023; Beck Wells, 2024; Doyle *et al.*, 2024). Like UDL-focused literature, neuroinclusive education research frames inclusive learning as a responsibility to be placed with the design of the learning environment and not with the individual learner (Carrington *et al.*, 2020; Cumming and Rose, 2022). Recent systematic reviews reveal an increased uptake of UDL within neuroinclusive education, yet the conceptualisation and application of UDL principles appears inconsistent and superficial, limiting the ability to fully evaluate the real-world efficacy of this framework (Bray *et al.*, 2024; Zhang *et al.*, 2024).

Within music education, UDL has mostly been discussed in relation to classroom teaching, choral and instrumental ensembles, and music theory (Quaglia, 2015; Armes, Harry and Grimsby, 2022; Salvador and Culp, 2022; Varvarigou, 2025). These studies suggest that UDL could better facilitate access, engagement, and learner agency across music learning contexts, it does not negate the lack of research exploring how UDL principles could be applied to the one-to-one context of the voice studio where learning is highly individualised, relational, and deeply embodied (Hogle, 2021; Efstathiou and Varvarigou, 2025). Moreso, research engaging

directly with neurodivergent singers, where the cognitive, relational, and sensory aspects of the voice studio are experienced even more intensely, is especially scarce (Moxness, 2023; Accardo *et al.*, 2025).

My planned programme of study is therefore situated at this intersection of UDL, voice pedagogy, and neuroinclusive education. Its interdisciplinary positioning reflects the paucity of research in this emerging field and the aim of the research question, which is to explore how UDL principles can inform the development of neuroinclusive studio-based voice pedagogy.

Aims and Objectives

The aim of this study is to explore how UDL principles are understood and applied across current literature, and how these understandings could translate to or inform the development of neuroinclusive voice pedagogy for AuDHD singers in the voice studio.

To achieve this, I will:

1. Identify and map literature that addresses UDL across neurodivergent, music education, and voice pedagogy contexts
2. Analyse how UDL principles are understood and applied, especially in relation to autism and ADHD
3. Evaluate the extent to which existing literature addresses the realities of learning as an AuDHD or neurodivergent singer
4. Synthesise findings to identify relevant pedagogical concepts that could be translated to neuroinclusive learning within the voice studio
5. Establish a concept map to guide my future practice development and pedagogical research.

I will address these objectives through the following research questions:

1. What existing literature is there on UDL?
2. How is UDL being actioned in music education and voice pedagogy?
3. How is UDL supporting the creation of neuroinclusive learning environments?
4. How might these findings shape my approach to teaching AuDHD singers?

Expected Learning Outcomes

Through this planned programme of study, I aim to:

1. Deepen my theoretical understanding of UDL as a framework for pedagogical design
2. Strengthen my skills in designing and conducting a structured literature review
3. Develop a more critical engagement with neuroinclusive pedagogy
4. Enhance my ability to conceptualise and design an AuDHD-affirming learning environment within the voice studio
5. Recommit to my development and identity as a practitioner-researcher within the field of evidence-based neuroinclusive voice pedagogy.

Planned Activities, Methodologies, and Timescales

The structure of this study is informed by a PRISMA-style approach to scoping reviews (Tricco *et al.*, 2018) with four overlapping phases:

1. Exploratory scoping and protocol development
2. Systematic searching and screening
3. Data charting and narrative synthesis
4. Pedagogical interpretation and reflexive integration (Arksey and O'Malley, 2005; Peters *et al.*, 2020).

I added review points following initial scoping, post-screening, and mid-analysis to further refine focus, inclusion criteria, and analysis (Arksey and O'Malley, 2005; Peters *et al.*, 2020). This was alongside continuous reflexive journaling to ensure my position as an insider-researcher was leveraged as a sensitising lens, and continually examined rather than unconsciously shaping the inquiry (Schon, 1983; Rolfe, Freshwater and Jasper, 2001; Braun and Clarke, 2021).

Task	September	October	November	December	January
------	-----------	---------	----------	----------	---------

[illegible]

Figure 1. Project Timescale

Methodology

Rationale

As my preliminary searches revealed that my research focus would sit in an emergent field (the intersection of UDL, neuroaffirming education, and voice pedagogy) with a paucity of literature (Moxness, 2023; Zhang *et al.*, 2024), it became apparent that a scoping review with narrative synthesis would be particularly well suited to this study. The purpose of scoping reviews is to map the existing research, understand how concepts are being applied, and identify gaps rather than evaluate the efficacy of an intervention (Arksey and O'Malley, 2005; Grant and Booth, 2009; Peters *et al.*, 2020). I chose to implement a PRISMA-ScR-informed approach to the scoping review so that I had the flexibility to integrate multidisciplinary sources whilst also documenting the transparency and rigour of my search design (Tricco *et al.*, 2018; Peters *et al.*, 2020).

I had considered systematic and rapid as there is already precedence for these within UDL literature to synthesise implementation trends and reported outcomes across educational contexts (Cumming and Rose, 2022; Bray *et al.*, 2024; Zhang *et al.*, 2024). Whilst the findings from these reviews does provide valuable insight into the scope of UDL's implementation and the challenges with interpreting and applying the guidelines accurately and consistently, they are mostly focused on collecting and evaluating outcomes with limited attention to how UDL guidelines are being interpreted and translated across pedagogical contexts (Cumming and Rose, 2022; Bray *et al.*, 2024; Zhang *et al.*, 2024). As this study aims to explore how UDL could be translated to the highly individualised and embodied nature of pedagogy within the

one-to-one environment of the voice studio (Fuelberth and Todd, 2017; Moxness, 2023), it requires the flexibility to integrate insights on the conceptualisation and implementation of UDL across multiple disciplines rather than evaluate the efficacy of interventions in education more generally, systematic and rapid reviews were not considered appropriate (Grant and Booth, 2009; Tricco *et al.*, 2018).

Narrative synthesis was chosen to support this aim of interpretive integration, as it facilitates the identification of patterns, tensions, and transferable insights across multidisciplinary texts (Popay *et al.*, 2006). This aligns with my aim of translating relevant pedagogical insights from UDL-focused literature across a diverse range of educational contexts towards developing a neuroinclusive pedagogy for the voice studio.

Epistemologically, this study is oriented within an interpretivist-constructivist paradigm, which understands knowledge as something that is not discovered but actively created through experience and engagement (Lincoln and Guba, 1985; Goundar, 2025). Narrative synthesis supports this stance by centering meaning-making, conceptual relationships, and theoretical coherence, allowing insights to emerge through critical and interpretive engagement with the literature rather than through descriptive summary alone (Popay *et al.*, 2006)

As an insider-researcher who coaches neurodivergent singers within the voice studio, I also needed an approach that would allow me to integrate reflexive, practice-informed understanding with the selected literature in this study. Narrative synthesis allowed my professional and lived experience to be leveraged as a sensitising lens, guiding my attention to nuances within the literature that would be most salient to neurodivergent students, voice pedagogy, and the unique environment of the voice studio, whilst still maintaining criticality and reflexive awareness (Schon, 1983; Rolfe, Freshwater and Jasper, 2001; Braun and Clarke, 2021).

Search Strategy and Source Selection

Guided by Arksey and O'Malley's (2005) scoping review framework, searches were exploratory and iterative. My preliminary search of Google Scholar helped me to understand the volume and conceptual spread of the UDL-focused literature with over 48,800 results for "universal design for learning" emphasising the need for clear search parameters. I began formal searches through the University of Wales Trinity St David's (UWTSD) online library, chosen for its breadth

and reliability in access to full texts, with supplementary searches through ERIC, an educational research database chosen to reduce the risk of missing key educational texts.

I systematically combined the core search term “universal design for learning” with population and practice-focused terms including, “autism”, “ADHD”, “AuDHD”, “music”, “singing”, “voice”. I have included the full search strings in Appendix C for transparency and replicability. I chose not to use the terms “neurodiversity” or “neurodivergent” due to inconsistent indexing across databases (Botha *et al.*, 2024). I also chose to apply a publication date range of 2013 onwards to reflect and capture potential conceptual shifts towards autism and ADHD following their recognition as potentially co-presenting conditions - it was previously understood that they were mutually exclusive (American Psychiatric Association, 2013).

Inclusion criteria were developed as I began initial familiarisation with the literature (Arksey and O'Malley, 2005) and required substantial engagement with UDL as a pedagogical framework, relevance to autism and/or ADHD, and transferability to voice pedagogy. Literature was included where it was peer-reviewed journals, book chapters, and conference papers published in English. Sources were excluded where there was little explicit engagement with UDL as a framework, disability focus was not transferable to AuDHD learning contexts, or where there was insufficient pedagogical relevance to music or voice. Screening of the sources was done in two stages, firstly I screened the titles and abstracts for relevance, and then full texts were screened for eligibility with all decisions documented using a PRISMA-style flow diagram as shown in figure 2 (Tricco *et al.*, 2018).

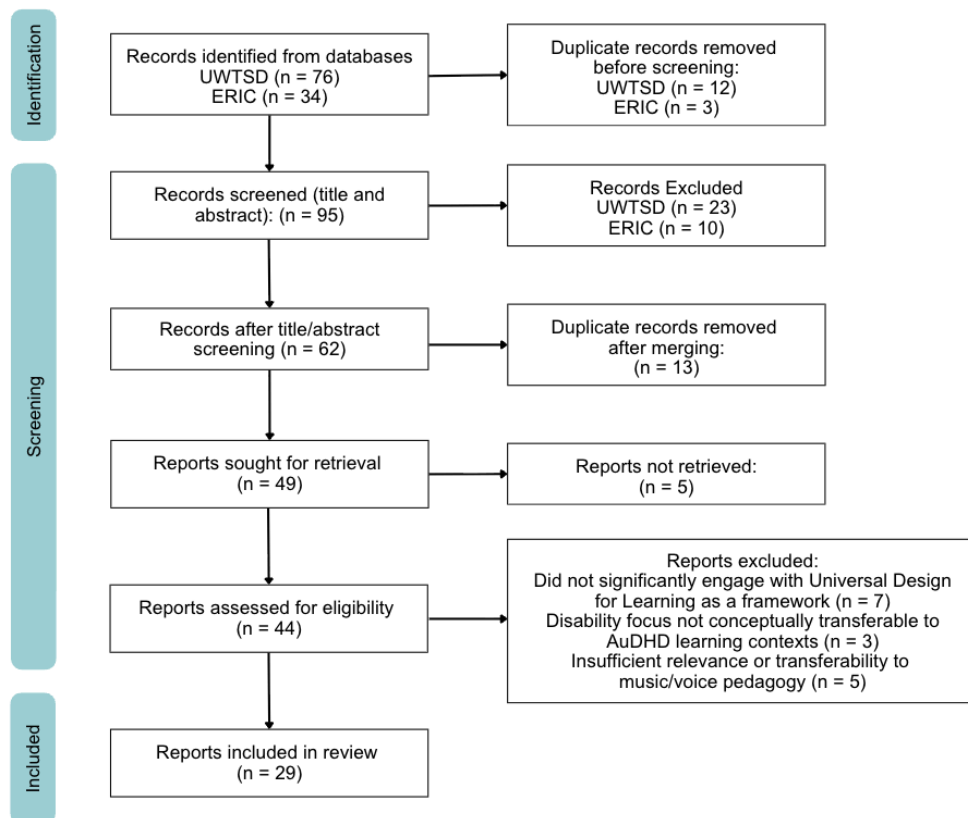


Figure 2. PRISMA-style flow chart of source selection process. Larger image available in Appendix X

Data Charting, Synthesis, and Reflexivity

I charted the included studies using a framework based on Arksey and O'Malley's (2005) approach, capturing publication details, learning context and population, UDL framing, and pedagogical implications. I further developed my charting framework to analyse how studies approached learner variability, engagement, agency, and learning environment design. This allowed me to synthesise the literature, identifying concept clusters, patterns, and tensions across the included studies (Popay *et al.*, 2006).

My analysis was informed by sensitising concepts that emerged from my previous participatory research, functioning as practitioner lenses rather than imposed analytic categories (Given,

2008; Braun and Clarke, 2021). An overview of these concepts and how they informed my analysis can be found in Appendix A. Throughout this study, I used reflexive journaling to maintain a critical awareness of my insider-researcher voice, explore my interpretive decisions, and keep a clear distinction between literature led insight and my experiential resonance with the subject matter (Schon, 1983; Rolfe, Freshwater and Jasper, 2001). Limitations of this review included time constraints, restriction to English language sources, and variable access to full texts.

Component Two - Project Report

Introduction

Emotional safety, sensory accessibility, lesson predictability, and learner agency are consistently identified within autism and ADHD research as essential conditions for engagement and learning (Carrington *et al.*, 2020; Beck Wells, 2024). This aligns with the accounts of singers who participated in my previous research into AuDHD learning preferences. Whilst that study is not included here as data, the participant accounts and my own learning differences as an AuDHD singer have sensitised my attention to these pedagogical conditions, providing an interpretive lens through which I have approached this literature review.

Within general education there has been an increasing awareness of neurodiversity and questioning of the inherited models of pedagogy that frame learning differences as deficits and access to learning as a responsibility of the individual learner (Podlucká, 2020; Hamilton and Petty, 2023). The neurodiversity paradigm positions neurotypes such as autism and ADHD as natural cognitive variance and highlights how educational barriers are created through misalignments between learners and learning environments, not as a result of learner differences (Hamilton and Petty, 2023; Accardo *et al.*, 2025). This paradigmatic shift within education has led to the development of neuroinclusive frameworks that highlight the anticipatory design of the learning environment as crucial to shaping access, participation, and belonging (Waitoller and King Thorius, 2016; Podlucká, 2020).

One such framework that is receiving growing recognition is Universal Design for Learning (UDL), which understands learner variability as a predictable norm that can be designed for through multiple means of engagement, representation, and action and expression (Levey, 2023; CAST, 2024). However, systematic and rapid reviews of UDL-focused literature reveal a considerable inconsistency with the way UDL is interpreted and implemented, raising questions about its translation across differing educational contexts (Bray *et al.*, 2024; Zhang *et al.*, 2024).

When considered in relation to one-to-one voice pedagogy, these issues become particularly salient. The voice studio is a particularly unique learning environment that is characterised by a high degree of embodiment, sustained one-to-one interaction, and a complex relationship between learning, identity, and self-expression (Fuelberth and Todd, 2017; Hogle, 2021). Singing lessons engage the body as both the instrument and the site of meaning-making, involving breath, posture, resonance, and emotion within a pedagogical culture centred on repeated critique, performance readiness, and subjective standards of vocal presentation (Hogle, 2021; Varvarigou, 2025). These aspects place an intense demand upon the sensory, emotional, and self-regulation workload of any singing student but they are especially demanding for neurodivergent students who require regulation, predictability, sensory access, and relational safety to be structurally embedded within the learning environment, not treated as pedagogical niceties (Carrington *et al.*, 2020; Barrera Ciurana and Moliner García, 2024). A misalignment between the learning and the learning environment might therefore be experienced not just cognitively, but also physically and emotionally, impacting engagement, confidence, and identity (Fuelberth and Todd, 2017; Hogle, 2021; Varvarigou, 2025).

Whilst the master-apprentice paradigm that voice studios are often unintentionally structured around is more frequently questioned (Fuelberth and Todd, 2017; Varvarigou, 2025), the inherited evaluation criteria relating to focus, stage presence, expression, and vocal presentation, often reflect neurotypical assumptions about attention, emotional display, communication skills, and self-regulation (Hogle, 2021; Moxness, 2023). These traditions can indeed foster artistry and technical development but they risk perpetuating deficit-based accommodations and barriers to learning, especially for singers whose sensory processing, regulation needs, or communication styles diverge from these expectations (Cumming and Rose, 2022; Hamilton and Petty, 2023; Moxness, 2023).

Despite the literature clearly and consistently articulating the voice studio as a learning environment which many neurodivergent students would find intensely and systemically

challenging to experience (Fuelberth and Todd, 2017; Moxness, 2023), there remains little research into how these environments could be redesigned to anticipate learner variability rather than responding on an adhoc basis (Moxness, 2023; Zhang *et al.*, 2024). It is this research gap that positions UDL as a potentially valuable framework through which to explore how voice pedagogy and the voice studio might be more proactively designed for AuDHD students (Waitoller and King Thorius, 2016; Cumming and Rose, 2022; Moxness, 2023).

This study therefore adopts a scoping review approach supported by narrative synthesis of the current literature addressing UDL across neurodivergent, music education, and voice pedagogy contexts. Rather than evaluate the efficacy of specific interventions, I aim to map conceptual patterns and tensions, examine pedagogical assumptions, and synthesise insights that could potentially reshape how I design the learning environment of my private voice studio. This review will begin by exploring the relationship between neurodivergence and access to meaningful learning opportunities within the voice studio, before analysing how UDL is interpreted and implemented across music education and voice training. Through narrative synthesis, I will identify and explore the relevance of recurring pedagogical themes and evaluate them in relation to the learning environment of the voice studio. I will conclude by discussing the implications of these insights for developing an inclusive framework for teaching AuDHD singers within the voice studio.

Review

Universal Design for Learning as a Pedagogical Design Framework

Universal Design for Learning is a pedagogical design framework grounded in neuroscience, cognitive psychology, and learning sciences that aims to reduce barriers to learning and support learner differences (CAST, 2024). A core assertion of UDL is that learner difference is a predictable norm, and that the responsibility for accessible learning lies with the design of environments that offer flexible pathways to meaningful learning (Cumming and Rose, 2022; CAST, 2024). For the voice studio, this assertion changes the focus from how each student is managed in lessons towards how the learning environment of the studio is itself constructed.

UDL is built upon three core principles (see figure 3):

1. Multiple Means of Engagement addresses the emotional and regulatory aspects of learning with a focus on motivation, emotional safety, and sustained effort as aspects of environment design rather than learner traits (Hamilton and Petty, 2023; CAST, 2024). Learning in the voice studio often involves a high level of vulnerability and this principle positions the required relational safety as a property of the learning environment and not the interpersonal skills of the teacher alone (Fuelberth and Todd, 2017; Hogle, 2021)
2. Multiple Means of Representation supports differences in sensory processing, language, attention, and existing knowledge through flexible methods in presenting information (Waitoller and King Thorius, 2016; CAST, 2024). In voice pedagogy, this principle questions how technique, sensations, and expectations are made clear and accessible (Hogle, 2021; Moxness, 2023).
3. Multiple Means of Action and Expression addresses how the learning environment can be designed to support various ways for learners to interact with their learning and demonstrate their understanding (Cumming and Rose, 2022; CAST, 2024). This principle challenges singing teachers to question their assumptions about what demonstration of competence looks like in the voice studio (Fuelberth and Todd, 2017; Varvarigou, 2025).

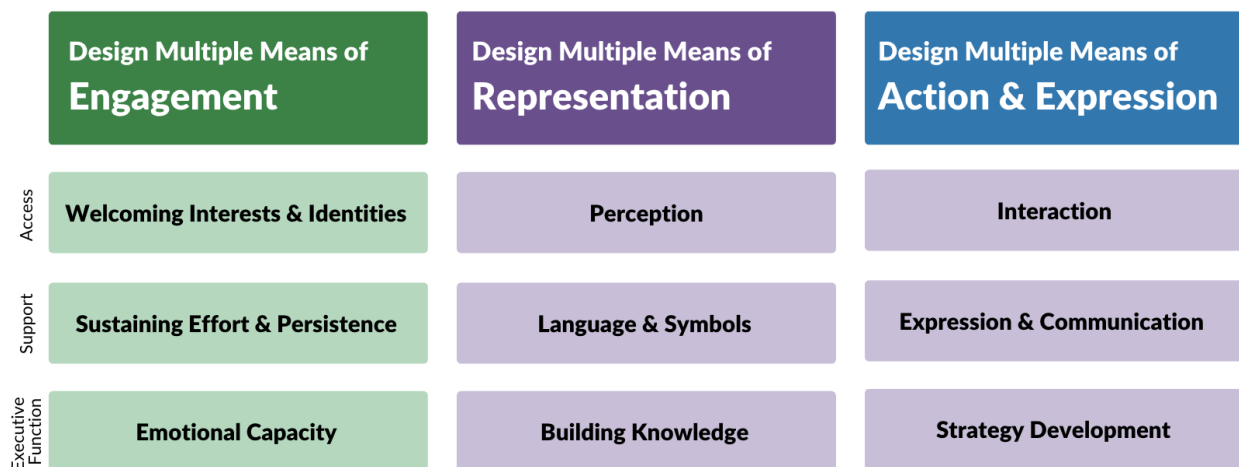


Figure 3. Simplified representation of the Universal Design for Learning Guidelines 3.0, illustrating the three core principles and the nine guidelines (CAST, 2024). The full image is presented in Appendix B.

The UDL Guidelines are not set forth as a list of teaching techniques, but as a pedagogical blueprint for creating learning environments that are intentionally free of socially constructed barriers to learning, supporting the development of learner regulation, comprehension, and

agency (CAST, 2024). When viewed as such, UDL is closely aligned with neuroaffirmative and social models of disability that also shift the responsibility of access from the learner to the learning environment, making inclusion a pedagogical design matter and not an accommodation (Waitoller and King Thorius, 2016; Hamilton and Petty, 2023).

The interpretation and implementation of UDL across the literature is, however, inconsistent. Recent systematic reviews reveal UDL being implemented more as a guide for generating resources, differentiated activities, and choice without critical awareness of how learning environments are being redesigned (Cumming and Rose, 2022; Bray *et al.*, 2024; Zhang *et al.*, 2024). This trend risks conflating UDL with Differentiated Instruction (DI), rendering its core objective of anticipatory design and learning environment responsibility redundant (Tomlinson, 2014; Waitoller and King Thorius, 2016; Bray *et al.*, 2024).

This inconsistency has distinct implications for translating UDL across disciplines. Its function as a framework for conceptualising the redesign of learning environments is significantly limited where UDL is increasingly implemented as model for flexible delivery of content. The reviewed literature represents UDL as a contested framework whose core ambition is inconsistently realised in practice (Cumming and Rose, 2022; Zhang *et al.*, 2024). Whether UDL is utilised as a toolkit or a design principle vastly impacts the way it would shape the creation of a neuroinclusive voice pedagogy, including how regulation is supported, how vocal knowledge is made accessible, and how learner agency is embedded into the culture and pedagogic structure of the voice studio. These questions shaped how I continued to engage with the literature as I explored the intersection of UDL and music education and voice pedagogy.

UDL and Neurodivergence

Within neuroinclusive education research, UDL is often positioned as a method for supporting access, engagement, and participation within mainstream education (Carrington *et al.*, 2020; Barrera Ciurana and Moliner García, 2024). The findings from these studies reveal an increase to perceived inclusion, access to learning, and learner agency, especially where environments offer multiple means of engagement and expression (Barrera Ciurana and Moliner García, 2024; Doyle *et al.*, 2024).

These results are indeed promising when looking to translate UDL to neuroinclusive voice pedagogy but the literature focuses on access to the learning content and means of

participation without consideration to regulation, embodiment, or the emotional experience. This pattern reflects broader trends within UDL literature that focus primarily on means of representation and participation over the emotional and regulatory aspects of learning despite UDL frequently being labeled as neuro-affirming and inclusive (Bray *et al.*, 2024; Zhang *et al.*, 2024).

UDL in Music Education and Voice Pedagogy

Within music education, UDL has mostly been discussed with relation to classroom music, choral and instrumental ensembles, and music theory where it addresses multimodal representation, flexible assessment, and expanded participation (Quaglia, 2015; Armes, Harry and Grimsby, 2022; Salvador and Culp, 2022; Varvarigou, 2025). These studies highlight the impact of offering multiple entry points to learning music, diversifying musical roles, and expanding the definition of competence beyond performance (Quaglia, 2015; Varvarigou, 2025).

Whilst this intersection of the literature does provide valuable insights into how UDL can support inclusion in creative, embodied learning environments, it remains largely focused on group-based contexts with little exploration of how relational dynamics, sensory conditions, and individual feedback practices can shape learning experiences (Armes, Harry and Grimsby, 2022; Roman, Collins and Son, 2024).

There is a significant lack of research explicitly addressing UDL, voice pedagogy, and neurodivergence. Moxness's (2023) practitioner study is a rare example of research on UDL for neurodivergent students in the voice studio, highlighting the lack of established frameworks to guide the anticipatory design of voice studios, and how undertheorised the transferability of classroom-based model is the voice studio (Fuelberth and Todd, 2017; Varvarigou, 2025). This gap is considerable given the distinct intensity of the learning environment within the voice studio, suggesting that existing implementations of UDL might not sufficiently address the relational and sensory aspects at the core of neuroinclusive voice pedagogy (Fuelberth and Todd, 2017; Hogle, 2021)

.

Narrative Synthesis: Towards a Neuroinclusive Vocal Pedagogy

Across the reviewed literature, inclusion is frequently positioned not as supportive additions to existing pedagogical models but as a question of how learning environments are structured and experienced (Waitoller and King Thorius, 2016; Carrington *et al.*, 2020; Hamilton and Petty, 2023). As I synthesised the literature in relation to the voice studio, four interrelated pedagogical domains emerged: regulation as a foundation for vocal learning; embodied and multimodal meaning-making; relational design with the studio environment; and structured autonomy within development pathways. These are not teaching techniques but design considerations that reposition voice pedagogy as structure to be embedded within the voice studio environment rather than within responsive teaching behaviours.

Regulation as a Pedagogical Foundation For Vocal Learning

Emotional safety, predictability, and sensory regulation emerge from the literature as foundational conditions for engagement, learning, and wellbeing (Carrington *et al.*, 2020; Barrera Ciurana and Moliner García, 2024; Beck Wells, 2024; Doyle *et al.*, 2024). Rather than viewed as additional supports, they are increasingly positioned as pedagogical infrastructure, key to shaping learners' capacity to access, process, and participate in learning (Cumming and Rose, 2022; Hamilton and Petty, 2023).

UDL-focused research also positions regulation within the principle of Multiple Means of Engagement (CAST, 2024). Within voice pedagogy, this centering of regulation is impactful. Singing engages the breath, complex muscle coordinations, auditory monitoring, and emotional expression, all within a context that can intensify self-consciousness and performance anxiety (Hogle, 2021; Efstathiou and Varvarigou, 2025). For neurodivergent singers, whose sensory processing, interoception, and nervous-system regulation might already be heightened, the studio environment itself becomes a powerful determining factor of accessible learning.

Across the literature, regulation is often supported where the learning environment offers clear structures and expectations, and sensory considerations (Carrington *et al.*, 2020; Durgungoz and Durgungoz, 2025). When translated to the voice studio, this suggests that elements such as pacing, room layout, task sequencing, and feedback are not neutral but act as regulatory signals. UDL frames these not as attributes of personal teaching style but as environmental variables that can be adjusted to reduce threat and support learner agency (Cumming and

Rose, 2022; CAST, 2024). This shifts regulation from a pastoral duty to a core pedagogical condition.

A UDL-informed voice pedagogy would therefore treat the studio as a regulatory environment where nervous-system arousal, emotional safety, and sensory load are intentionally designed to enhance a singer's capacity for experimentation, musical risk-taking, and vocal presence. Regulation becomes the foundation for building vocal development.

Embodied Meaning-Making and Multimodal Access

Within voice pedagogy, embodied meaning-making is already central to learning although it remains individualised and unevenly theorised across the literature (Fuelberth and Todd, 2017; Hogle, 2021). Singing teachers routinely draw upon imagery-based and technical explanations supported by teacher demonstrations but without an explicit design framework that questions how these methods are selected, ordered, or made accessible (Moxness, 2023). UDL principles of representation, and action and expression, highlight how understanding is supported when learners can access and express learning through varied sensory, symbolic, and motor pathways (Waitoller and King Thorius, 2016; CAST, 2024). Studies addressing autism and ADHD, similarly reflect the value of modelling, visual aids, experiential learning, and opportunities to anchor abstract concepts in physical experience (Carrington *et al.*, 2020; Beck Wells, 2024).

For voice pedagogy, this highlights the need to reframe explanation, demonstration, and practice not as the communication of correct sensations and interpretations of vocal concepts, but as perceptual landscapes through which singers can construct their own meaning. A neuroinclusive studio would intentionally curate multiple ways of perceiving and organising vocal experience. Multimodal design becomes an intentional and supportive way to expand the singer's interpretive agency, enabling them to develop personal and meaningful anchors for technique, artistry, and self-regulation within their vocal training.

Relational Design within the Voice Studio

Neuroinclusive pedagogy emphasises the co-construction of learning environments in which power, communication, and expectations are made explicit and negotiable (Hamilton and Petty, 2023; Accardo *et al.*, 2025). UDL also situates engagement within social contexts, viewing

belonging, identity, and perceived relevance as key drivers of participation (Waitoller and King Thorius, 2016; CAST, 2024).

Within the voice studio, the relational aspect of learning is amplified, it is a site of sustained one-to-one interaction, evaluative feedback, and embodied vulnerability (Hogle, 2021). Authority is often placed with the teacher's listening, aesthetic judgment, and technical expertise, positioning the singer's body and sound as objects of professional scrutiny (Fuelberth and Todd, 2017; Moxness, 2023). Whilst these dynamics can support trust and development, they can also lead to feeling exposed, misunderstood, and lacking in agency, especially for neurodivergent singers (Accardo *et al.*, 2025)

A UDL-informed neuroinclusive voice pedagogy would therefore see the studio as a negotiated learning environment rather than a fixed instructional space. Practices such as collaborative goal-setting, explicit discussion of learning preferences, and flexible means of feedback become more than supportive techniques but channels through which power, agency, and authority are redistributed challenging the inherited master-apprentice model of the voice studio.

Structured Autonomy and Flexible Development Pathways

Across autism and ADHD literature, learner agency is consistently related to motivation, self-regulation, and perseverance (Barrera Ciurana and Moliner García, 2024; Doyle *et al.*, 2024) UDL actions this through emphasis on choice, relevance, and self-direction, suggesting that learning environments should support learners in goal setting, progress monitoring, and adapting approaches (Waitoller and King Thorius, 2016; CAST, 2024). Music education research reflects this through calls for flexible assessment, diverse learning pathways, and expanded definitions of musical success (Quaglia, 2015; Salvador and Culp, 2022; Roman, Collins and Son, 2024).

Within traditional voice pedagogy these development pathways are often structured around professionalised performance outcomes (Fuelberth and Todd, 2017; Hogle, 2021). Whilst such pathways can offer clarity, then can also limit autonomy and sideline singers whose goals, sensory preferences, and learning styles diverge from established norms (Moxness, 2023; Varvarigou, 2025).

Synthesised across the literature, structured autonomy emerges as a design consideration that balances scaffolding and choice. For the voice studio, structured autonomy requires a reconsideration of how vocal progress is understood and communicated. A UDL-informed approach would invite the design of development pathways that could be navigated in multiple ways. Technical goals, song choice, practice routines, and performances become adjustable destinations along the learning journey rather than fixed milestones that determine the view of successful learning.

From Responsive Teaching to Anticipatory Studio Design

Together, these four pedagogical domains suggest a conceptual shift from responsive accommodation of learner difference to anticipatory pedagogical design. Across the literature, inclusion is consistently positioned as a matter of pedagogical design, focused on how learning environments are created to anticipate learner differences rather than respond when learner challenges arise (Waitoller and King Thorius, 2016; Cumming and Rose, 2022; Hamilton and Petty, 2023).

Within the voice studio, where teaching has traditionally relied upon individual adaptation (Moxness, 2023), this shift is a significant epistemological one. Whilst responsiveness is still necessary, the synthesis suggests that relying on teacher intuition alone risks reproducing uneven access and positioning inclusion as an afterthought rather than intentional design. A UDL-informed voice pedagogy for AuDHD singers is therefore not a menu of teaching strategies to pick from but a framework for critically examining the voice studio and intentionally redesigning it from the ground up.

Implications, limitations, and future directions

The narrative synthesis undertaken in this study suggests that neuroinclusive voice pedagogy cannot be meaningfully advanced through the addition of inclusive strategies alone. Rather, the literature points towards the need for a reframing of the voice studio as a learning environment in which regulation, embodiment, relationality, and agency are structurally embedded. This has significant implications for both practice and future research within voice pedagogy.

From a practice perspective, the findings suggest that neuroinclusive voice pedagogy requires a shift from responsive inclusion towards anticipatory pedagogical design. Environments that

support regulation, multimodal meaning-making, relational design, and flexible development pathways must be considered anticipatory design concerns rather than responsive adjustments.

At the same time, the review highlights limitations within both the literature and the present study. Research explicitly addressing neurodivergent singers within one-to-one voice pedagogy remains extremely sparse, limiting the extent to which findings can be grounded in studio-specific empirical research (Moxness, 2023; Accardo et al., 2025). Much of the literature drawn upon originates from classroom-based or higher education contexts, requiring careful interpretation when translated to the embodied and relational conditions of vocal training. Also, while UDL provides a valuable framework, the literature reveals considerable inconsistency in how its principles are interpreted and implemented (Bray et al., 2024; Zhang et al., 2024), highlighting the need for critical engagement rather than uncritical adoption.

Methodological limitations also shaped the review. As a desk-based scoping study, I was able to map conceptual patterns but cannot speak to the efficacy and impact of them in practice. In addition, the multidisciplinary breadth of the review, while necessary, restricted the depth within any single context. The deliberate prioritisation of peer-reviewed literature, while supporting rigour, also limits engagement with practitioner-developed frameworks, organisational guidance, and emerging studio-based innovations that currently sit largely within grey literature. This boundary was intentionally maintained to establish the contours of the recognised academic evidence base but it also highlights the extent to which neuroinclusive voice pedagogy remains under-represented within formal research. These limitations reinforce the exploratory nature of the study and point towards the importance of subsequent practice-based and participatory research.

Future directions therefore lie in the development and examination of design-informed voice pedagogy frameworks. The synthesis here offers a conceptual foundation for such frameworks. In particular, there is a clear need for practice-led research exploring how UDL-informed design principles might be implemented within one-to-one voice studios, how neurodivergent singers experience such environments, and how anticipatory design reshapes pedagogy, learning pathways, and vocal progress.

As such, this review functions not as a conclusion, but as a conceptual bridge: from mapping and synthesis towards the intentional design of neuroinclusive vocal learning environments grounded in evidence, reflexivity, and collaboration.

Critical reflection

I undertook this study from a practitioner-researcher position where critical reflection functions not as retrospective commentary but as a methodological and ethical process through which my assumptions, power dynamics, and professional identity are engaged with critically (Brookfield, no date). Schön's (1983) concepts of reflection-in-action and reflection-on-action provided a sensitising framework throughout the review, supporting systematic examination of how my prior pedagogical understanding shaped both the conduct of the study and the interpretive lenses through which the literature was read. I used reflexive journaling throughout the research process to document conceptual shifts, emotional responses, and critically examine the relationship between my neurodivergent identity, professional experience, and emerging theoretical understanding (Rolfe, Freshwater and Jasper, 2001; Finlay, 2002).

This reflective stance directly supported the learning outcomes I outlined in the programme of study, particularly the deepening of my theoretical understanding of UDL as a design-oriented pedagogical framework and the development of more critical engagement with neurodiversity-affirming pedagogy. Rather than approaching UDL as a set of inclusive strategies, the review process required sustained engagement with its epistemological claims, conceptual ambiguities, and disciplinary translations, strengthening my capacity to evaluate frameworks rather than apply them uncritically.

Disruption of prior pedagogical assumptions

At the start of this study, my understanding of neuroinclusive voice pedagogy was strongly learner-focused. Inclusion was primarily implemented through responsiveness: adapting explanations, tasks, and pacing in relation to disclosures, observed difficulties, or arising access needs. Whilst these practices were grounded in compassion and experiential empathy, the literature encountered through this review destabilised this orientation. Neurodiversity-affirming and UDL research consistently shifts responsibility for access from the learner to the learning environment, reframing inclusion as a matter of pedagogical architecture rather than individual adjustment (Waitoller and King Thorius, 2016; Cumming and Rose, 2022; Hamilton and Petty, 2023)

Engaging critically with this body of literature exposed the extent to which my teaching had remained within a deficit-based model of accommodation. Even where difference was reframed as

strength, access was still contingent upon learner self-advocacy or arising difficulties. This recognition constituted a significant epistemic shift. It required acknowledging that intuitive neuroaffirmation does not equate to inclusive design, and that responsiveness, while relationally valuable, still placed the burden of access upon the learner.

This disruption was central to developing a more critical engagement with neuroinclusive pedagogy as outlined in the learning outcomes. Rather than affirming existing practices, the literature demanded a reframing of what inclusion asks at a pedagogical level, extending my understanding of UDL from a flexible teaching approach to a design-oriented epistemology focused on anticipatory responsibility.

Emotional, ethical, and neurodivergent reflexivity

Critical reflection literature emphasises the importance of viewing emotional responses as sites of professional learning, particularly where ethical and identity-level assumptions are unsettled (Finlay, 2002; Brookfield, 2017). The destabilisation of my pedagogical assumptions was accompanied by pronounced emotional responses, including grief at recognising the unintended consequences of practices I experienced as ethical, alongside a sense of illumination as previously implicit structures of my own practice became visible.

As an AuDHD practitioner, this disruption was also experienced neurodivergently. Cognitive disorientation coexisted with intellectual excitement, particularly in relation to the emerging design trajectory of the research. Rather than treating this tension as a threat to academic objectivity, I engaged with it reflexively through sustained journalling, iterative reading, and structured reflection informed by Schön's (1983) model. This process enabled me to interrogate how deficit-based accommodation models, personal biases, and inherited master-apprentice pedagogies were embedded within my teaching despite explicit commitments to inclusion.

Reframing authority, power, and pedagogical responsibility

A further outcome of this study concerns a fundamental reframing of authority within the voice studio. Previously, I frequently framed my teaching stance through learner autonomy, positioning students as directing their own learning. Engagement with UDL and neuroinclusive pedagogy complicated this narrative. Literature highlighting power, access, and environmental responsibility makes it clear that agency cannot be meaningfully exercised in spaces that have

not already been designed for access (Waitoller and King Thorius, 2016; Hamilton and Petty, 2023).

This review prompted recognition that positioning students as “in charge” does not balance the asymmetries of expertise, evaluation, and control of the learning environment inherent in one-to-one teaching. Instead, it risks obscuring where responsibility for access lies. Authority, reframed through a design-oriented lens, is not something to relinquish but something to exercise ethically: through anticipatory responsibility for sensory conditions, relational norms, task structure, and development pathways.

This shift enhances my capacity to design AuDHD vocal learning environments and to challenge traditions within voice pedagogy that rely heavily on expertise and pedagogical personality, opening space for the systematic development of neuroinclusive studio models grounded in evidence and design principles.

Practitioner-Researcher Identity and Developmental Trajectory

Conducting this scoping review has reshaped my understanding of research itself. Rather than viewing research as an supplementary to practice, I now view it as an ethical obligation of teaching. Practitioner-research literature positions such inquiry as central to professional responsibility, enabling teachers to challenge inherited models, develop and expand their expertise, and contribute to pedagogical discourse (Schon, 1983; Rolfe, Freshwater and Jasper, 2001).

This study has consolidated my identity as a practitioner-researcher committed to evidence-based neuroinclusive pedagogy, directly addressing the final learning outcome of this programme of study. Looking forward, my findings from this study will inform the development of artefacts in future modules, supporting a coherent research trajectory oriented toward the development of neuroinclusive voice pedagogy.

Limits of reflection and ongoing criticality

Whilst this reflection evidences significant epistemic and professional reorientation, it is intentionally yet to be acted upon. The conceptual developments described in the findings have not yet been tested within redesigned studio environments or examined through participatory research with neurodivergent singers. There remains a risk that my design aspirations may

outpace my lived pedagogical realities, or that any new frameworks I implement may inadvertently reproduce exclusionary dynamics.

Acknowledging these limits reinforces the necessity for continued reflexivity, empirical scrutiny, and collaborative design processes (Finlay, 2002; Brookfield, 2017). Perhaps for me, the most significant outcome of this study might not be the conceptual framework it suggests, but the sustained critical orientation it has cultivated towards pedagogy, power, and professional responsibility.

Conclusion

This study set out to explore how Universal Design for Learning (UDL) principles are interpreted and implemented across contemporary literature, and how these interpretations might inform the development of neuroinclusive voice pedagogy for AuDHD singers. Through a scoping review and narrative synthesis spanning research on neuroinclusive education, UDL principles, and music and voice pedagogy, the research has enabled a significant expansion and reorientation of my understanding of both inclusive pedagogical design and vocal teaching. What began as an exploration of inclusive pedagogical principles, has developed into a conceptual engagement with pedagogy as an embedded structure within the design of the learning environment marking a shift from responsive accommodation toward anticipatory design.

The synthesis establishes that while UDL is increasingly positioned as a framework for inclusion, its pedagogical significance lies less in specific teaching strategies than in its design-oriented epistemology. Across the literature, learner difference is consistently reframed as normal, and responsibility for access is moved from the individual learner to the learning environment. When translated into the context of voice pedagogy, this reframing positions the studio as a learning environment in which regulation, embodiment, relational dynamics, and development pathways are foundational constructs for meaningful learning within voice training. This represents a significant departure from dominant traditions within voice education that rely on implicit expertise and individualised adaptations, and instead invites the intentional construction of studio environments grounded in evidence and design principles.

In addressing the research questions, this study has mapped a fragmented but conceptually generative field, identified critical gaps in research relating to neurodivergent singers, and

synthesised cross-disciplinary insights into a foundation for developing a framework relevant to neuroinclusive vocal training. This process has deepened my theoretical understanding of UDL as a pedagogical design framework, strengthened my capacity to conduct literature reviews, and enhanced my critical engagement with neuroinclusive pedagogy. The study's primary contribution lies in its synthesis, offering a foundation through which neuroinclusive voice pedagogy can be critically examined, intentionally developed, and empirically explored.

Rather than functioning as an endpoint, this research establishes a trajectory towards pedagogical design, artefact development, and practice-based inquiry. In doing so, it positions neuroinclusive vocal pedagogy not as an extension of existing studio practice, but as an emerging field of design-oriented research requiring sustained critical, collaborative, and empirical engagement.

References

- Accardo, A.L. *et al.* (2025) 'Valuing Neurodiversity on Campus: Perspectives and Priorities of Neurodivergent Students, Faculty, and Professional Staff', *Journal of diversity in higher education*, 18(S1), pp. S306–S320. Available at: <https://doi.org/10.1037/dhe0000571>.
- American Psychiatric Association (2013) 'Neurodevelopmental Disorders', in *Diagnostic and Statistical Manual of Mental Disorders: DSM-5™*, 5th ed. Arlington, VA: American Psychiatric Publishing, pp. 50–51, 59–66. Available at: <https://doi.org/10.1176/appi.books.9780890425596>.
- Arksey, H. and O'Malley, L. (2005) 'Scoping studies: towards a methodological framework', *International Journal of Social Research Methodology*, 8(1), pp. 19–32. Available at: <https://doi.org/10.1080/1364557032000119616>.
- Armes, J.W., Harry, A.G. and Grimsby, R. (2022) 'Implementing Universal Design Principles in Music Teaching', *Music Educators Journal*, 109(1), pp. 44–51. Available at: <https://doi.org/10.1177/00274321221114869>.
- Barrera Ciurana, M. and Moliner García, O. (2024) "'How does universal design for learning help me to learn?": students with autism spectrum disorder voices in higher education', *Studies in higher education (Dorchester-on-Thames)*, 49(6), pp. 899–912. Available at: <https://doi.org/10.1080/03075079.2023.2259932>.
- Beck Wells, M. (2024) 'Supporting Higher Education Students with Attention Deficit Hyperactivity Disorder through Universal Design for Learning', *College Teaching*, 72(3), pp. 227–230. Available at: <https://doi.org/10.1080/87567555.2022.2160959>.
- Botha, M. *et al.* (2024) 'The neurodiversity concept was developed collectively: An overdue correction on the origins of neurodiversity theory', *Autism*, 28(6), pp. 1591–1594. Available at: <https://doi.org/10.1177/13623613241237871>.
- Braun, V. and Clarke, V. (2021) 'Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches', *Counselling and Psychotherapy Research*, 21(1), pp. 37–47. Available at: <https://doi.org/10.1002/capr.12360>.

Bray, A. *et al.* (2024) 'What next for Universal Design for Learning? A systematic literature review of technology in UDL implementations at second level', *British Journal of Educational Technology*, 55(1), pp. 113–138. Available at: <https://doi.org/10.1111/bjet.13328>.

Carrington, S. *et al.* (2020) 'What Universal Design for Learning principles, guidelines, and checkpoints are evident in educators' descriptions of their practice when supporting students on the autism spectrum?', *International journal of educational research*, 102, p. 101583. Available at: <https://doi.org/10.1016/j.ijer.2020.101583>.

CAST (2024) *Universal Design for Learning Guidelines version 3.0*, CAST UDL Guidelines. Available at: <https://udlguidelines.cast.org> (Accessed: 28 July 2025).

Cumming, T.M. and Rose, M.C. (2022) 'Exploring universal design for learning as an accessibility tool in higher education: a review of the current literature', *The Australian Educational Researcher*, 49(5), pp. 1025–1043. Available at: <https://doi.org/10.1007/s13384-021-00471-7>.

Doyle, A. *et al.* (2024) 'What does an ADHD-friendly university look like? A case study from Ireland', *International journal of educational research open*, 7, p. 100345. Available at: <https://doi.org/10.1016/j.ijedro.2024.100345>.

Durgungoz, F.C. and Durgungoz, A. (2025) "'Interactive lessons are great, but too much is too much": Hearing out neurodivergent students, Universal Design for Learning and the case for integrating more anonymous technology in higher education', *Higher education* [Preprint]. Available at: <https://doi.org/10.1007/s10734-024-01389-6>.

Efstathiou, R. and Varvarigou, M. (2025) 'How inclusive are our music classrooms? A theoretical model and case study from a preschool class of a mainstream private nursery school in Cyprus', *Music Education Research*, 27(2), pp. 148–162. Available at: <https://doi.org/10.1080/14613808.2025.2454646>.

Finlay, L. (2002) 'Negotiating the swamp: the opportunity and challenge of reflexivity in research practice', *Qualitative Research*, 2(2), pp. 209–230. Available at: <https://doi.org/10.1177/146879410200200205>.

Fuelberth, R. and Todd, C. (2017) “‘I Dream a World’: Inclusivity in Choral Music Education’, *Music Educators Journal*, 104(2), pp. 38–44. Available at: <https://doi.org/10.1177/0027432117735875>.

Given, L.M. (2008) ‘Sensitizing Concepts’, 2, pp. 812–814. Available at: <https://doi.org/10.4135/9781412963909.n422>.

Goundar, P.R. (2025) ‘Researcher Positionality: Ways to Include it in a Qualitative Research Design’, *International Journal of Qualitative Methods*, 24, p. 16094069251321251. Available at: <https://doi.org/10.1177/16094069251321251>.

Grant, M.J. and Booth, A. (2009) ‘A typology of reviews: an analysis of 14 review types and associated methodologies’, *Health Information & Libraries Journal*, 26(2), pp. 91–108. Available at: <https://doi.org/10.1111/j.1471-1842.2009.00848.x>.

Hamilton and Petty (2023) ‘Compassionate pedagogy for neurodiversity in higher education: A conceptual analysis’, *Frontiers in psychology*, 14. Available at: <https://doi.org/10.3389/fpsyg.2023.1093290>.

Hogle, L.A. (2021) ‘Fostering singing agency through emotional differentiation in an inclusive singing environment’, *Research Studies in Music Education*, 43(2), pp. 179–194. Available at: <https://doi.org/10.1177/1321103X20930426>.

Levey, S. (2023) ‘Universal Design for Learning’, *Journal of Education*, 203(2), pp. 479–487. Available at: <https://doi.org/10.1177/00220574211031954>.

Lincoln, Y.S. and Guba, E.G. (1985) *Naturalistic Inquiry*. SAGE.

Mercé Barrera Ciurana *et al.* (2023) “‘How Does Universal Design for Learning Help Me to Learn?’: Students with Autism Spectrum Disorder Voices in Higher Education’, *Studies in Higher Education*, 49(6), pp. 899–912.

Moxness, A. (2023) *Universal Design for Voice Teaching: Including Singers with Autistic Ways of Being in the Studio Through Neurodiversity-Affirming Vocal Pedagogy*, ProQuest Dissertations and Theses. M.F.A. Boston Conservatory at Berklee. Available at: <https://www.proquest.com/dissertations-theses/universal-design-voice-teaching-including-singers/docview/2833508512/se-2?accountid=130472>.

Peters, M.D.J. *et al.* (2020) 'Updated methodological guidance for the conduct of scoping reviews', *JBI Evidence Synthesis*, 18(10), p. 2119. Available at: <https://doi.org/10.11124/JBIES-20-00167>.

Podlucká, D. (2020) 'Transformative Anti-Ableist Pedagogy for Social Justice: Charting a Critical Agenda for Inclusive Education', *Outlines. Critical practice studies*, 21(1), pp. 69–97. Available at: <https://doi.org/10.7146/ocps.v21i1.118234>.

Popay, J. *et al.* (2006) *Guidance on the conduct of narrative synthesis in systematic reviews: A product from the ESRC Methods Programme*. Lancaster University. Available at: <https://doi.org/10.13140/2.1.1018.4643>.

Quaglia, B.W. (2015) 'Planning for Student Variability: Universal Design for Learning in the Music Theory Classroom and Curriculum', *Music Theory Online*, 21(1). Available at: <https://mtosmt.org/issues/mto.15.21.1/mto.15.21.1.quaglia.html> (Accessed: 8 January 2026).

Rolfe, G., Freshwater, D. and Jasper, M. (2001) *Critical Reflection for Nursing and the Helping Professions: A User's Guide*. Palgrave MacMillan.

Roman, T.A., Collins, E.E. and Son, H. (2024) 'Supporting Music Literacy for Students with Special Needs in the Elementary General Music Classroom: A Design Case of a Digital Tool', *TechTrends*, 68(5), pp. 962–972. Available at: <https://doi.org/10.1007/s11528-024-00984-9>.

Salvador, K. and Culp, M.E. (2022) 'Intersections in Music Education: Implications of Universal Design for Learning, Culturally Responsive Education, and Trauma-Informed Education for P–12 Praxis', *Music Educators Journal*, 108(3), pp. 19–29. Available at: <https://doi.org/10.1177/00274321221087737>.

Schon, D.A. (1983) *The reflective practitioner: how professionals think in action*. New York: Basic Books.

Tomlinson, C.A. (2014) *The differentiated classroom: responding to the needs of all learners*. 2nd edition. Alexandria, VA: ASCD.

Tricco, A.C. *et al.* (2018) 'PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation', *Annals of Internal Medicine*, pp. 467–473.

Varvarigou, M. (2025) 'Conducting Inclusion: A UDL-Inspired Approach to Choral Education', *Visions of Research in Music Education*, 47(1), pp. 6–26.

Waitoller, F.R. and King Thorius, K.A. (2016) 'Cross-Pollinating Culturally Sustaining Pedagogy and Universal Design for Learning: Toward an Inclusive Pedagogy That Accounts for Dis/Ability', *Harvard educational review*, 86(3), pp. 366–389. Available at: <https://doi.org/10.17763/1943-5045-86.3.366>.

Zhang, L. *et al.* (2024) 'Unraveling Challenges with the Implementation of Universal Design for Learning: A Systematic Literature Review', *Educational Psychology Review*, 36(1), p. 35. Available at: <https://doi.org/10.1007/s10648-024-09860-7>.

Appendices

Appendix A:

Overview of Sensitising Themes Informing the Review

This scoping review was informed by four sensitising themes that were developed through my previous participatory research for module three, '*Metaphors or Mechanics? An Exploration of Learning Preferences in Adult AuDHD Singers*'. These themes are not treated as data but as sensitising concepts (Blumer, 1954) that shaped the way I questioned the literature, the patterns I noticed, and the interpretive, practitioner-focused lens through which I read the sources.

Theme 1: Metaphors AND Mechanics Help Me Understand (Multimodal Explanations)

Reflects participants' preference for hybrid explanations that bridge imagery-based, and technical explanations, with teacher demonstrations. Participants did not prefer one method over another, instead valuing the way that imagery-based descriptions made learning engaging and accessible but technical explanations helped to contextualise and consolidate the concepts before physical application. This theme sensitised the review to literature that addressed multiple means of representation and the relationship between affective and technical knowledge.

Theme 2: My Body Helps Me Learn (Embodied Cognition)

Highlights the central role of embodied, sensory, and visually anchored learning strategies that led to meaningful learning for the participants. Participants described the need to connect the often abstract concepts of voice to physical practice before they could fully understand and process the learning. This theme sensitised the review to literature that addressed embodied cognition, multisensory learning strategies, and the role of action and perception in understanding.

Theme 3: I Need To Feel Safe So I Can Trust The Process (Emotional Safety and Regulation)

Positions emotional safety and regulation as prerequisites to learning rather than pastoral niceties. Participants frequently expressed that regulation, relational trust, and identity validation enabled greater engagement, increased comfort with experimentation (especially important

when working with the voice), and easier access to learning. The theme sensitises the review to literature that addresses neuroaffirming pedagogy, affective aspects of learning, co-regulation, and the design of the learning environment.

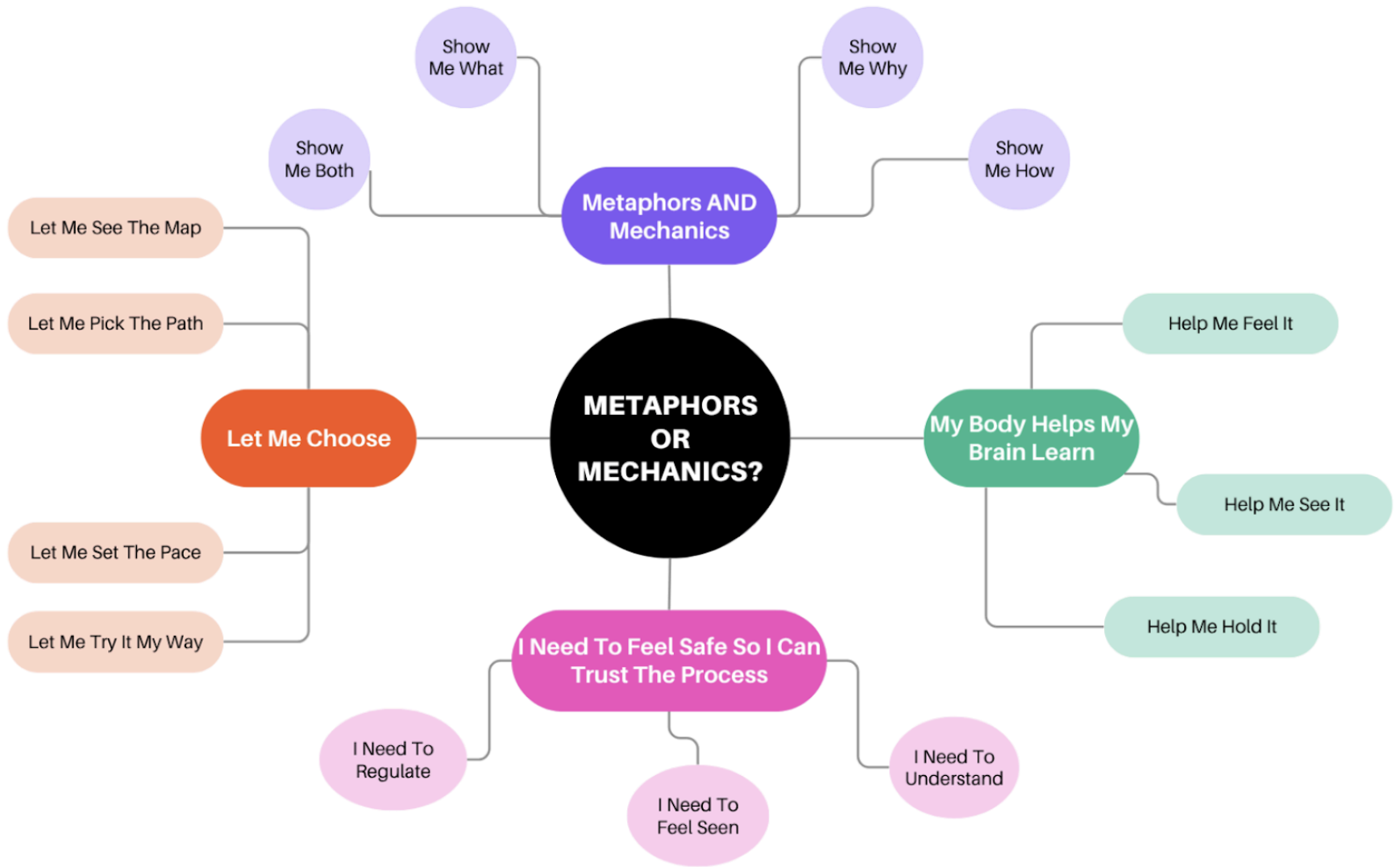
Theme 4: Let Me Choose (Structured Autonomy)

Reflects participants' desire for structured autonomy within the learning space. This included clear lesson structure, responsive pacing, space to experiment and personalise their learning, and opportunities for choice. Participants described this autonomy as central to motivation, ownership, and consolidation of learning. This theme sensitised the review to literature that addressed learner agency, flexible design, and constructivist approaches to pedagogy.

Taken together, these sensitising themes foreground emotional safety, multimodal representation, learner agency, and embodied learning. They support the selection of Universal Design for Learning as an appropriate framework for developing neuroaffirming and inclusive approaches to designing the learning environment of the voice studio.

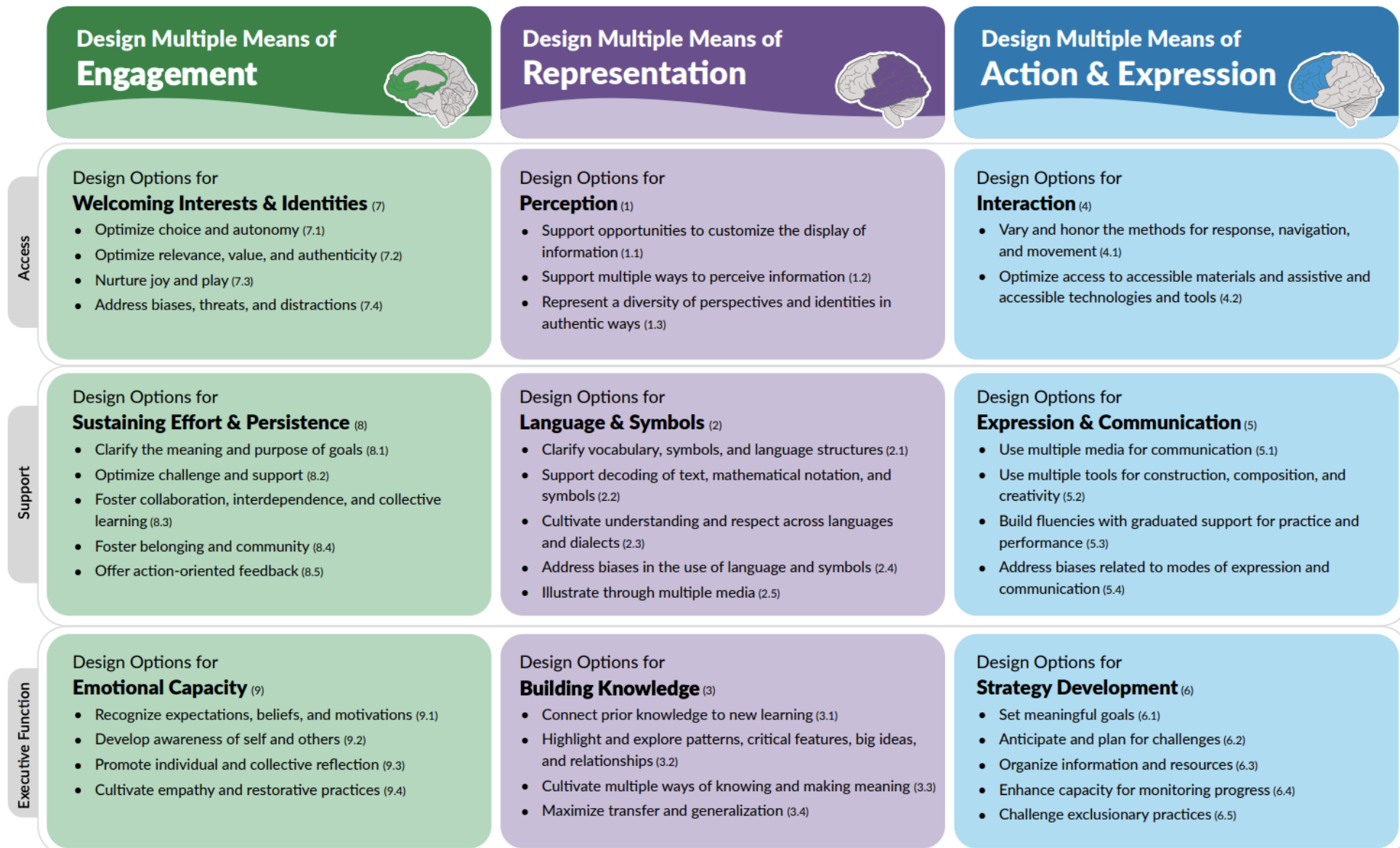
A visual map of these themes is included in this appendix to further support transparency.

Appendix A1: Visual Map of Sensitising Themes



Appendix B:

UDL Guidelines 3.0 Graphic Organiser (CAST, 2024)



Appendix C:

Database Search Strategies

Overview of Search Approach

Preliminary scoping searches were conducted on Google Scholar to assess the breadth, disciplinary spread, and approximate volume of literature on Universal Design for Learning (UDL). These early searches returned over 48,600 records, establishing the expansiveness of UDL and supporting the need for defined search parameters.

Primary searches were conducted via University of Wales Trinity St. David's (UWTSD) online library to ensure reliable access to full-text peer-reviewed literature. Supplementary searches were carried out in ERIC, chosen for its specialist focus on educational research, and to reduce the risk of missing relevant educational research.

Although neuroinclusivity was a key focus in this review, UDL is already situated within the inclusivity paradigm and “neurodiversity” was not used as a core search term. This is due to it and its variants (neurodiverse, neurodivergence, neurodivergent) being inconsistently indexed across databases. Person-focused terms of “autism”, “ADHD”, and “AuDHD” were used instead to reflect the population centred in the research questions. UDL is already situated within inclusive education

“Education” was also not included as a search term due to the fact UDL is itself an educational framework. Searches were therefore anchored to “music”, “singing”, and “voice” to identify relevant educational research without conceptual redundancy.

Search Strings

The following primary search strings were used across databases to identify UDL literature that engaged with music and voice related domains, as well neurodivergent contexts:

(“universal design for learning” OR UDL)

AND (music OR singing OR voice)

and

("universal design for learning" OR UDL)

AND (ADHD OR AuDHD OR autism)

Supplementary searches were also included to support conceptual mapping of literature at the intersection of UDL, music/voice, and neurodivergence:

("universal design for learning" OR UDL)

AND (music OR singing OR voice)

AND (ADHD OR AuDHD OR autism)

And to narrow the field even further to UDL research and the specific learner identity of AuDHD within music contexts:

("universal design for learning" OR UDL)

AND (music OR singing OR voice)

AND ADHD

AND autism

Appendix D:

Inclusion and Exclusion Criteria

The following inclusion and exclusion criteria were developed iteratively in response to the research questions. They were further refined following preliminary scoping searches on UDL literature. These criteria were designed to balance sensitivity to the UDL literature with a clear focus on music and voice pedagogy in relation to AuDHD learners.

Inclusion Criteria

Sources were included where they met all of the following:

- **Conceptual focus:** explicit engagement with Universal Design for Learning (UDL), including conceptual discussion, pedagogical application, or design-informed teaching approaches.
- **Pedagogical context:** situated within music, singing, voice, or closely related performing arts education contexts OR presented relevant concepts or insights that were transferable to the voice studio.
- **Learner focus:** addressed autistic, ADHD, or AuDHD learners, OR learning differences explicitly framed in relation to autism, ADHD, or AuDHD.
- **Publication characteristics:** peer-reviewed journal articles, book chapters, or conference papers. Published in English.

Exclusion Criteria

Sources were excluded where they met one or more of the following:

- **Conceptual irrelevance:** did not engage explicitly with UDL or used “universal design” only in architectural or technological accessibility contexts without pedagogical application OR focused exclusively on non-music disciplines without transferable relevance to music or voice pedagogy.
- **Learner focus:** addressed inclusion in general terms without reference to autism, ADHD, or AuDHD, unless pedagogical implications were clearly applicable to learner variability.

- **Publication type:** Non-peer-reviewed sources, opinion pieces, editorials, blogs, or unpublished theses. Non-English language publications.

Appendix E:

Screening and Selection Process

Presented below is an outline of the screening procedures used to select relevant sources for this review. Screening procedures were designed to support transparency, consistency, and alignment with the research questions.

Overview of screening stages

Screening was conducted in three sequential stages:

1. Preliminary scoping and de-duplication
2. Title and abstract screening
3. Full-text screening and final selection

At each stage, sources were assessed against the inclusion and exclusion criteria outlined in Appendix D.

Stage 1: Preliminary scoping and de-duplication

Following preliminary scoping searches, all records retrieved from the primary and supplementary databases were exported into Zotero. Duplicate records were removed prior to formal screening. At this stage, sources were briefly reviewed to exclude items that were clearly irrelevant.

Stage 2: Title and abstract screening

Titles and abstracts were screened to determine potential relevance to the research questions. Records were kept where relevance was clear or ambiguous, to prioritise sensitivity and avoid premature exclusion, consistent with scoping review methodology. Records that clearly failed to meet the inclusion criteria (Appendix D) were excluded at this stage.

Stage 3: Full-text screening and final selection

The full texts of retained sources were reviewed in detail. Final inclusion decisions were made through close reading and interpretive judgement, guided by the inclusion and exclusion criteria (Appendix D). Where relevance was borderline, decisions were informed by conceptual

alignment, pedagogical contribution, and transferability to music and voice pedagogy. Reasons for exclusion at this stage were recorded to support transparency and auditability.

Reflexive Screening Approach

Screening was undertaken reflexively, informed by the interpretivist-constructivist positioning of the study. Decisions were not limited to keyword presence alone but considered conceptual relevance, pedagogical contribution, and contextual transferability. Reflexive prompts and decision-guiding tools were used to support consistency and transparency during this process (see Appendix G).

Study flow

A PRISMA-style flow diagram illustrating the search and screening process, including the number of records identified, screened, excluded, and included, is provided here to support auditability of the selection process.

