

An Investigation into the Efficacy of an Online Vocal Training Platform for Neurodivergent Singers

The Project Proposal

Context and Justification

The researcher works as an autistic singing teacher working at conservatoire level and in private practice, including online. His experiences of vocal training, and those of his autistic children in performing arts, suggests that better provision is needed for neurodivergent singers.

The impact of the COVID-19 Pandemic upon education was profound, with education providers having little time to prepare for a move to online learning before lockdown began. During previous modules for this course, evidence emerged that autistic learners may better manage their individual communication asynchronously (Howard and Sedgewick, 2021). Whilst voice practitioners such as Tom Burke already run asynchronous courses these do not specifically address the varied needs of neurodivergent singers. This project, therefore, intends to explore the intersectionality between neurodivergence and online vocal tuition.

Neurodivergence refers to those ‘individuals whose selective neurocognitive functions/neurodevelopmental differences fall outside prevalent societal norms’ (Shash et al. 2022, p.). Whilst views differ on which conditions fall under the umbrella of neurodivergence, these are recognised within the National Health Service (NHS, 2025) as including autism spectrum condition/disorder, attention deficit hyperactivity disorder (ADHD), Tourette’s Syndrome, dyslexia, dyspraxia, dysgraphia, and dyscalculia, amongst others. Comorbidity and varying presentations of these conditions is commonplace with neurodivergence (Bonti et al., 2024), making the topic a complex one. To ensure that the project is feasible within the timescale of the project, the primary focus will be on the needs of autistic singers but with continuous consideration of other conditions.

Experience suggests that neurodivergent singers in the voice studio may experience barriers to learning. Where anxiety or sensory issues are heightened, attendance to lessons or participation in vocal tasks has been affected. Whilst attempts to provide guidance for arts organisations when working with autistic creatives, such as Equity’s (2025) guide, attempt to promote inclusive practice, this does not address the needs of singers specifically. It is hoped that this research project may go some way to address this.

Personal learning outcomes

- To develop a further breadth and depth of knowledge of neurodivergence.

- To improve research techniques when studying the effects of an intervention with neurodivergent singers.

The Intended Impact

The intended impact of the project is to:

- Develop an understanding of developments in online vocal tuition.
- Develop an understanding of singing teachers' views towards working with neurodivergent students.
- Develop an understanding of what the needs of neurodivergent singers may be for an online learning platform.
- Attempt to develop a platform, based on the perspectives of the participants and the evidence base.
- Gain an understanding of the efficacy of the platform from the perspectives of the participants.
- Develop an action plan to improve future iterations of the platform.

The Outlined Intention

- The development of the platform will be an ongoing process throughout the project as evidence emerges from the literature and participants. Accessibility

features and checking will be central in facilitating access. The site will be populated with explainer videos and technical exercises for participants to explore.

- An initial online questionnaire will be created and distributed via online forums for singing teachers. The questions will attempt to ascertain trends in online vocal tuition, such as how selected platforms might have changed over time, any challenges that were experienced, and student engagement with online learning.
- Five singing teachers will be recruited as participants to take part in semi-structured interviews. Participants will be singing teachers who have taught online, and/or have experience of teaching neurodivergent singers. The questions will focus on themes that arise during preliminary reading and from authorial experience as an autistic singer.
- Five neurodivergent singers will be recruited as participants. Participants will undergo a semi-structured interview prior to gaining access to the platform, with topics being shared with them in advance to avoid the potential for anxiety from not knowing what the interviews will entail.
- Participants will be given access to the platform for two weeks.
- Following the trial period, participants will undertake another interview or a questionnaire to explore their experience of using the platform.

Ethics

Given that some participants, such as autistic individuals, may interpret language literally, it will be necessary to ensure that the conditions of participation are 'specific, informed and unambiguous (Information Commissioner's Office, 2024). To ensure that informed consent is acquired, participants will be informed of the nature of the research and the reason for it being conducted; what its purpose is and how it how the results may be used; access to the results, such as where they may appear and the potential audience for the findings; a clear outlining of participants' involvement in the conducting of the study and its likely timescale; and, finally, that participants involvement is voluntary and that they are free to withdraw without prejudice, as per the University's Research Ethics & Integrity Code of Practice (2022). Informed consent will be obtained via means of a digital form in pdf format, which will be signable. Methods such as surveys will rely on an agreement to proceed, prior to submitting the survey.

For the purposes of Schedule 1 of the Data Protection act, this project is for the benefit of the public interest in the field of academia and art, as the subject matter is both educational and musical. As the study aims to develop a platform that focuses specifically on the vocal training of neurodivergent adult singers, the collection of data from participants will be necessary.

- The process of obtaining the informed consent of potential participants will necessitate the collection of personally identifiable information.
- Whilst it is not anticipated to be necessary to do so, the names of participants will not be released in the final report, nor will the names be shared. After

receiving informed consent, participants will be pseudonymised in the reporting. Passwords for files containing personal information will not be shared.

- Research methods, such as the use of online interviews, are likely to require playback to analyse participant responses. It is anticipated that audio footage of interviews may be collected via interview to obtain participant feedback on their experiences of using the platform.
- All data and communication will be deleted on receipt of completion of the course. No data will be shared with third parties.
- A separate email address will be created for all communications with participants. Member checks may be used to provide participants to test my reconstruction of their experiences of technical singing training through the online platform. It is anticipated that participants will be provided with either a copy of the report or a summary of its findings to ensure that neurodivergent people are not disenfranchised from research that concerns them.

Insider Research

As an autistic person and singing teacher conducting a piece of qualitative research, it is important to consider the motivation for this research (Breen, 2007, Unluer, 2012). In this instance, difficult experiences during the author's own training have been a motivating factor to develop an intervention to help other neurodivergent singers to achieve their potential. An awareness of personal feelings towards such

personal adversity will be essential if personal bias is to be minimised and objectivity maintained.

Being an autistic person and singing teacher provides access and an understanding of the community that is a beneficial as a researcher (Unluer, 2012). However, Shore (2004) reminds the reader that autism presents in many ways, and in a study of neurodivergence, which is comprised of many other conditions, the potential for variations between individuals is much greater. Maintaining an awareness of this will be essential if the behaviours of neurodivergent people are to be examined fully.

GANTT Chart

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Apply for ethical approval									
Preliminary reading									
Write project proposal									
Literature search									
Design methods and write methods section									
Distribute questionnaire to singing teachers									
Recruit participants									
Conduct first interviews with singing teachers and ND group									
Create platform									
ND participants access platform									
Second interviews to ND group									
Transcribe, code, and develop themes									
Write up findings and results									
Submit draft									
Revise the report									
Final submission									

Expected Learning Outcomes

By the end of this study, the researcher will

- Gain a broader contextual understanding of online vocal teaching
- Research and develop an online training platform for neurodiverse adult singers
- Recruit ten singing student participants to test the platform
- Recruit ten singing teachers to explore their experiences of working with neurodivergent students online
- Produce a literature review to discover salient themes and best pedagogical practice
- Select an online learning platform suitable for the research
- Develop a course to be hosted online that addresses an area of pedagogical practice, which, in this instance, will be focused the development of technique
- Evaluate the efficacy of delivering the content by means specifically by the use of an online platform by seeking the views of neurodivergent singers who participate in the study

The Project Report

Introduction

Awareness the neurological differences is becoming more widespread, and it is likely that the singing teacher is already teaching somebody with a non-visible condition, such as autism spectrum condition or disorder (ASC or ASD), attention deficit hyperactivity disorder (ADHD), or a range of other conditions that are classified as being neurodivergent. Whilst organisations, such as the National Autistic Society run courses on aspects of autism (NAS, 2025), these are aimed at various stakeholders, including educators, the police, and health care providers, requiring the practitioner to synthesise the information in ways that may inform studio practice. However, it is noticeable that recent courses in the UK, run by providers such as the British Voice Association and Voice Study Centre are focused upon the needs of the neurodivergent singer.

Personal and professional context

The author is a recently diagnosed autistic person and father to autistic adults, both who are trained and have, or are currently working in the performing arts in a musical capacity. The term 'neurodiversity' was coined in 1998 (), which was the year in which the author graduated from his conservatoire training in classical singing. Some pedagogical language was incomprehensible to the author, leading to strategies which later required medical investigation for a voice disorder. As a singing teacher of twenty-five-year experience, currently in private practice and within a conservatoire setting, how to address the needs of all students has long been a concern. To ensure that autistic students, as well as others whose neurology differs from the norm, have the best training possible has become a moral imperative for the development of his professional practice.

Justification for the study

The focus of a previous module explored developing an autistic-friendly teaching studio, although the COVID-19 pandemic forced all singing teachers to develop their online practice. Previous searches of professional journals showed a surprising lack of information about teaching autistic students, with the Journal of Singing only having published two articles at the time.

During the project, evidence suggested that asynchronous forms of communication were preferred by autistic people generally, allowing time for scripting of responses and the avoiding of environments that provided sensory challenges. The question formed as to whether asynchronous teaching resources may benefit singing students at times when in person teaching was difficult for them. This project aims to assess the extent to which an online learning platform may benefit neurodivergent people.

Intended impact

This project is primarily intended to provide the neurodivergent singers with an online learning platform which contains resources to develop their singing in an environment that they can control. To avoid sensory issues and triggers for anxiety during challenging period may have benefits for their wellbeing. However, the research tools may help neurotypical teachers, or neurodivergent teachers with a

different neurotype, to consider their own professional practice when working with these singers.

For the researcher, the immediate impact should be development of a prototype learning platform that is based on the needs of neurodivergent singers. This may have the effect of raising the researcher's profile as a singing teacher in this field. It may also impact upon his private practice, if neurodivergent singers choose to seek in-person, online, or blended tuition.

Aims:

- To design a study to address the needs of neurodivergent singers that is sound in methodology, ethical issues, including a continuous re-evaluation of insider researcher issues
- To develop the skills to gather, analyse, and evaluate data collected from stakeholders in neurodivergent singing education, understanding the potential for conflicting needs between neurotypical-to-neurodivergent and neurodivergent-to-neurodivergent students and teachers.
- To make recommendations for the development of the prototype online learning platform, based on the evidence provided by stakeholders in neurodivergent singing tuition
- To critically reflect upon the experience of conducting research, and the outcomes of the research, to inform future professional development needs

Personal learning outcomes

- To develop a further breadth and depth of knowledge of neurodivergence.

- To improve research techniques when studying the effects of an intervention with neurodivergent singers.

Literature Review

The singing teacher who wishes to work with neurodivergent people needs to be aware that the neurodivergence is an umbrella term for many conditions or disorders. Asasumasu (2015) stresses that neurodivergence is inclusive in its conception, including those with injuries or diseases of the brain, as well as neurodevelopmental conditions, such as autism spectrum disorder or condition (ASD), attention deficit hyperactivity disorder (ADHD). Walker (2021), however, rails against those from individual activism groups who aim to appropriate the terminology, believing that this obfuscates the meaning of the term and excludes other peoples of neurological difference. This appropriation of neurodivergence may be particularly problematic in conditions such as autism, which itself has subsumed conditions such as Asperger's Syndrome in the diagnostic manuals (Barahona-Corrêa and Filipe, 2016). There is a preference for some previously diagnosed with Asperger's Syndrome to retain the term, suggesting that there is an element of political identity to neurodivergence (Singer, 2017). The singing teacher, therefore, must be sensitive to the needs to people if a respectful approach to teaching neurodivergence is to be established.

Neurodivergence needs to be considered in a wider context if it is to be understood what is being diverged from. Consistently demonstrating behaviours that conform to

societal norms situates the individual 'within the boundaries of neuronormativity' (Walker, 2021, p.60, which is referred to as being 'neurotypical' (Walker, 2021, p.60). However, this dichotomy of neurodivergence and neurotypicality, given the normalcy ascribed to being neurotypical, has led to the term being used pejoratively (Brown and Conner, 2025).

Disability and Neurodivergence

Considering the relationship between neurodivergence and disability is complicated due to differing perspectives how disability is defined. In the medical model of disability, conditions, such as autism spectrum disorder, are mental disorders that occur because of either genetics or environment (Chown, Murphy, and Suckle, 2023). The use of words such as 'syndrome' or 'disorder', in relation to autism, ADHD, and Tourette's are also indicative of a medicalised approach to such conditions. According to Chown, Murphy, and Suckle (2023), proponents of the medical model view that removing autism from autistic people, or at least normalising those traits, would be of benefit for the individuals affected, regardless of any strengths that it may bring. At worst, some individuals been institutionalised due to their autism, a situation which the National Health Service (NHS) of the United Kingdom (UK) has committed to reducing in its long-term plan for autism (Commons Library Research Briefings, 2024).

Disability advocates take a different position in relation to disability and impairment to that of the medical model. The Union of the Physically Impaired Against Segregation's (UPIAS) and Disability Alliance's (1975) Fundamental Principles of

Disability is an important document to consider, as this shifts disability away from the individual to the way in which society imposes disability upon them. However, a weakness of this model is that it only considers disability from the position of physical disability, and therefore is still, to an extent, a model of exclusion (Shakespeare, 2010). The needs for this exclusion to be addressed led to the development of a new movement.

Challenges posed by family members with autism caused Judy Singer, herself an autistic person, to consider how to advocate for those with neurological differences (Singer, 2017). The term 'neurodiversity', a portmanteau of 'neurological' and 'diversity' was coined as part of Singer's ambition for a 'grand new social movement for neurological marginalised groups in the mould of the feminist, gay liberation or disability movements' (Singer, 2017, p.22). Proponents of neurodiversity view neurological differences as being natural variations in the population (Le Cunff et al, 2025).

Neurodiversity and Vocal Pedagogy

The contrast between the language of the medical model and the neurodiversity model field of vocal pedagogy can be observed in the two articles currently published in the Journal of Singing. Cravero (2020, p.160) states that 'voice teachers will be faced with... teaching studio voice lessons to students on the autistic spectrum' later utilising language of impairment drawn from the diagnostic manuals. Coates (2022, p213) outlines that a greater awareness of neurodiversity amongst singing teachers is leading to a transition away 'from an accommodation model to an affirmation

model in our voice spaces'. This contrast in language may be important in influencing the singing teacher's thinking and attitudes, as 'being faced with' was replaced with another minority group, could be highly problematic.

Whilst the medical and social models of disability contain language that would be specific to each one, there are instances where some crossover does occur. The usage of language of neurodiversity, for example, appears on the NHS website (NHS, 2025) despite the process of diagnosis still being based on the impairment of the individual. This move away from discussions of disability in relation to neurodiversity has led to some criticism that the health needs of neurodivergent people are being adversely affected in the UK. Findings by Hirvikoski et al. (2016) that incidences of premature are higher in autistic people would seem to support this criticism, although these incidences occur across a range of medical issues. If this was transposed into vocal pedagogy, an awareness of the practical need of the neurodivergent student and the language related to neurodivergence need to be balanced, if students are to achieve of their best.

A consideration of the 'deficit' and 'difference view' of disability (Lewis and Lynn, 2018, p.3) may be useful in framing the discussion of how best to attend to students' needs. The difference view suggests that 'disability is in the inaccessibility of the tools' (Lewis and Lynn, 2018, p.3), rather than something that is an 'internal

characteristic of the student'. This reframing of the problem to something that the teacher can influence may be more conducive to student development.

The History of Universal Design for Learning

Universal Design was developed in the United States (US) as means of designing accessible spaces for disabled people and an ageing population from conception, rather than needing to add accommodations afterwards (Macie, Hardie, and Place, 1990). This pre-emptive strategy for inclusion transferred to the field of education in the form of the Universal Design for Learning (CAST, 2018), which provides a framework to address the many needs of all learners (Nave, 2020). According to Boysen (2021, p.1) 'educators have adopted universal design as a metaphor for accessibility in teaching and learning', which makes UDL pertinent to the development of meeting the needs of neurodivergent learners. However, recent legal judgement in the United Kingdom (UK) emphasises the duty of education providers to pre-emptively provide reasonable adjustments to students, regardless of a diagnosis of any condition (Equality and Human Rights Commission, 2024). In this context, Nave's (2020, p.30) statement that 'Universal Design for Learning principles help all learners regardless of instructional modality' is an important one to examine for the singing teacher attempting an intervention for neurodivergent learners.

To consider how to promote students' engagement and motivation with the subject is a priority, as perseverance is needed to sustain progress (Nave, 2020). Positively

reinforcing the aims and objectives through the course of study and embedding these within the learning platform is suggested as a means of encouraging accountability (Nave, 2020).

The Universal Design for Learning Framework

The stated aim of developing expert learners (CAST, 2018) is one that is likely to be attractive to educators who are exploring UDL for the first time. The means to achieve this is a framework that utilises the three aspects out of the multiplicity of cognitive networks: 'recognition networks (the WHAT of learning), strategic networks (the HOW of learning), and affective networks (the WHY of learning) (Meyer and Rose, 2024, location 1036). For the practitioner to consider that students need differing strategies to access learning aligns with the foundational principles of providing means of engagement, representation, and of action and expression (Meyer and Rose, 2024).

Criticisms of Universal Design for Learning

The question of whether UDL can be truly universal is one that has led to criticism. Whilst Meyer, Rose, and Gordon (2014) believe that UD can aid all learners in all contexts, Anastasiou, Wiley and Kaufman (2025) question the feasibility of a truly universal design. This moves beyond the original concept of Mace (1998, p.23), who

stated that, despite measures to accommodate all, 'there will always be people who cannot use an object'.

There is some concern that the theory underpinning UDL is unproven (Boysen, 2021; Murphy, 2021). According to Murphy (2021), the purported basis in neuroscience is hypothetical due to a lack of scientific literature being cited in the work. A further criticism centres on the advocates of UDL, due to the lack of priority given to the collecting of evidence proving its efficacy (Murphy, 2021). Boysen (2021) recommends that control groups are needed to test the efficacy of UDL. Whilst this might be problematic if some students are excluded from a potentially advantageous strategy, the use of intermittent usage of UDL and non-UDL strategies by the same students are suggested as a suitable means of addressing these concerns.

Online learning

The COVID-19 pandemic caused worldwide disruption to the provision of education (Dhawan, 2020; Pokhrel and Chhetri, 2021). In the UK, the transition from face-to-face tuition to online learning was rapid, occurring within a week of the announcement of the first lockdown (Institute for Government, 2025).

According to Dhawan (2020), online learning 'offers a great deal of flexibility in terms of time and location', which may be beneficial for the neurodivergent singer.

Heyworth et al, (2021) found that, whilst the initial transition to online learning was

challenging, some students reported a reduction in their levels of stress due to the challenging behaviours that can occur in the classroom not being present. The home, being a sensorially-familiar place, and the ability to structure learning were reported by some participants to be more conducive than the school setting (Heyworth et al., 2021).

Where are we now?

Regardless of competing models of disability, UK legislation enshrines the rights of disabled people in UK law through the *Equality Act 2010*. Specifically, the organisation who provides a service for disabled people must provide them with reasonable adjustments to be able to participate fully (*Equality Act, 2010*). As conditions, such as autism, are classed as a disability (National Autistic Society, 2025), it is incumbent for education providers to meet the demands of the legislation. The implication of recent legal precedent means that the point at which these accommodations are implemented does not require a medical diagnosis, but can be pre-emptive (Equality and Human Rights Commission, 2024). Knowledge of this is essential if the singing teacher operating a private studio is to comply with their legal obligations.

Methods

The Choice of Paradigm

Guba and Lincoln's (1994) work informed the decision-making process in adopting a theoretical underpinning for this study. According to Guba and Lincoln (1994, p.17), paradigms are synonymous with a person's worldview. As an autistic person, the

ontological position of relativism, considering ‘local and specific constructed realities’ (Guba and Lincoln, 1994, p.109) seemed pertinent, given the communication differences and sensory issues faced in everyday life and relationships. From an epistemological perspective, the subjectivism (Guba and Lincoln, 1994) of other people was pertinent, as other neurodivergent people’s worldviews may also be influenced in the same way as the researchers. As someone who wishes to provide opportunities for learning for other neurodivergent singers, the researcher acknowledges his position as a ‘passionate participant’ (Guba and Lincoln, 1994, p. 112) within the research. Given the totality of these considerations, it was clear that the project was being approached from a constructivist worldview.

Having considered the positionality of the researcher, attention needed to be given to the collection of data. As a qualitative study, understanding the research question required the purposeful selection of participants (Cresswell, 2014).

Participant selection and Data Collection Methods

The Questionnaire

Given the focus of the project was on the usage of online learning platforms, it was decided to gain an overview of online teaching behaviours. The COVID-19 pandemic had a profound effect on teaching habits due to the repeated lockdowns that occurred, however this was five years ago, and teacher’s usage of platforms may have developed in that time. It was decided that a questionnaire would be the most suitable method of data collection to gain such a broad overview of the topic. A link to the questionnaire (Appendix B) was shared on numerous singing teacher

websites, with a request for the link to be shared with other interested parts to permit snowball sampling. An element of convenience sampling was also employed through the sharing the of questionnaire with work colleagues. Whilst the initial response was encouraging, a slowing in the rate of responses led to the decision to repost the questionnaire. The total number of participants was 18, all of whom were anonymous.

The questionnaire required participants to disclose their experiences of online teaching before, during, and after the COVID-pandemic, to ascertain the degree to which COVID had influenced professional practice. Several topics were asked at each stage: who was teaching; what platform they used; what issues did they experience with technology; and what their experience with student engagement was. Whilst this is a qualitative study, the questionnaire was designed to be closed-ended enough to provide some quantitative data. Preliminary reading had suggested that engagement could be an issue in online learning, and short answer questions were included at each stage to provide teachers with the opportunity to express their views.

Recruiting Neurodivergent Participants

The decision to conduct semi-structured interviews was based on Hastwell et al., (2021, p.57), who used this form of interviewing to gain 'rich data' from participants. Conversations about the study with former students known to be neurodivergent had garnered some interest in participating in the study. Whilst this purposive sampling would clarify the research question (Cresswell, 2014), a consideration of

convenience was tempered by the knowledge that this may introduce bias, as not all previous neurodivergent students followed the researcher's social media. The use of these participants alone may have led to difficulties in generalising the findings to the wider population (Jager, Putnick, Bornstein, 2017). It was decided that the accounts of these students needed to be gathered, but to allow for greater generalisation, a poster was designed and circulated to social media outlets. Requesting readers to share the poster to interested parties was used as a form of snowball sampling, a sampling technique regarded as being an effective means of reaching respondents who may be difficult to access (Ting et al., 2025).

The inclusion criteria for participants were that they must be over eighteen and have been diagnosed, or are in the process of, obtaining a diagnosis of a neurodivergent condition. Whilst this may have the potential to produce inaccurate findings, the awareness that adults may have an awareness of their neurodivergence, but choose not to pursue diagnosis (van Rijswik and Curşei, 2025). It was also considered that to exclude does not reflect the inclusive nature of Asasumasu's (2015) definition of neurodivergence.

A total of seven students gave consent to participate in the study. One of these submitted the application after the interview schedule had concluded. Of the participants that we selected, all were female, and aged between twenty and twenty-five years of age. Upon receipt, participant names were replaced with a code (S1-6), with the codes being stored separately from participant details to provide a level of

pseudonymisation (Information Commissioner's Office, 2025). The 'S' identifier was used as a means of distinguishing between the neurodivergent singers and teachers.

Recruiting Singing Teacher Participants

Being a member of the singing teacher community through personal connections and in professional forums provided easy access to potential participants. Posts were made on singing teacher forums with a request for the post to be shared to permit snowball sampling to occur. The criteria for inclusion required participants to be singing teachers who had experience of teaching online and had also had experience of teaching neurodivergent students.

Four singing teachers were eventually recruited, three of which were colleagues, and one singing teacher that was previously unknown to the researcher. A further participant did express interest, however personal circumstances did not allow for this in the timeframe of the interviews. Upon acceptance, these participants were assigned with the codes T1-4 to distinguish them from the neurodivergent groups.

The Interview Process

Prior to committing to participate, participants were supplied with an information sheet to ensure that what was expected of them was clear (Gowen et al., 2020).

In planning the interview, it was necessary to ensure that the potential for unexpected changes was minimised, as this may be problematic for some neurodivergent (Gowen et al., 2020).

The questions for the interviews were circulated to participants as part of the onboarding process onto the study, to minimise the potential for anxiety. These were provided for both neurodivergent singers and teachers alike, as the neurotype of the teachers was not ascertained on the consent form.

The appointment times were mutually agreed by email to ensure that participants were not pressured into a response that wasn't suitable for them. A subsequent email was sent with a link to the meeting from the Zoom platform, with a follow-up email from the researcher's project email address to ensure receipt.

As a novice autistic researcher, a structure was needed to conduct a thematic analysis of the interview recordings. A six-phase process, as outline by Braun and Clarke (2006) was used. The first phase was to transcribe the interviews, which provided insights that weren't possible in the moment. The transcripts were then analysed for key words and ideas and comments made in the documents. The third phase, 'searching for themes' (Braun and Clarke, 2006, p.87) involved transferring the codes to a spreadsheet and moving codes that were similar in theme to the same column. Phrase four, 'reviewing the themes' (Braun and Clarke, 2006, p.87) occurred after several days to allow for reflection on the codes and accuracy of the themes, and some codes were moved as the themes were a little unclear. The ability to begin to utilise the themes and codes to tell a research story was an organic

link to phase five, 'defining and naming themes' (Braun and Clarke, 2006, p.87). The final stage was to produce the report (Braun and Clarke, 2006), which required relating the themes back to the transcripts to provide a selection of 'vivid, compelling extract examples' (Braun and Clarke, 2006, p.87) to enable the synthesis of literature and accounts in the context of the research question.

Triangulation

According to Carter et al. (2014, p.545), using multiple forms of evidence can 'test validity through the convergence of information from different sources.' Whilst seemingly separate to the topic, the predominantly quantitative nature of the questionnaire was deemed to be important in maintaining objectivity, providing a means by which to consider aspects of the findings from the interviews.

Ethics

The United Nations (2004) used the International Day of Disabled Persons to promote the concept that disabled people should be involved in decisions that concern them. Disability groups have long championed the motto 'nothing about us, without us' (UN, 2004) and it is this respect for neurodivergent personhood that was deemed to be central to the conducting of this project. Cascio et al (2020) reminds the researcher research ethics are both regulatory but require also require person-

centred approach. Ensuring that the voices of neurodivergent people was essential in avoiding bias, given the researcher's own neurodivergence and experiences.

The conducting of research did not begin until ethical clearance had been granted by the University's Ethics Committee, which was granted on the 31st of January 2025 (Appendix A). The process of gaining informed consent was introduced at the point of devising the research instruments. In line with the University's Research Ethics and Integrity Code of Practice (2022), information was provided at the beginning of the questionnaire (Appendix B) and the participant information and consent forms, giving those who did not wish to proceed a chance to navigate away from the page.

When considering the needs to gain consent from a person-centred perspective, a considering of differing communication needs was necessary. The knowledge that asynchronous forms of communication was addressed using an online form which could be completed at their leisure. To give the potential participant with clarification on anything contained within the participant information sheet, a separate email address was created. Although participants for the questionnaire could complete the form anonymously, the final stage of completion to provide consent before submission was mandatory.

Insider research

According to Breen (2007, p.163) 'generally, insider-researchers are those who chose to study a group to which they belong, while outsider-researchers do not belong to the group under study'. In the context of this study, the researcher was an insider to the neurodivergent participants and with the singing teacher participants, providing access to those communities. The knowledge that this may lead to a loss of objectivity was a concern (Breen, 2007), but it was considered that neurotypical singing teachers would form part of the study, which meant that the researcher fulfilled a dual role of both insider- and outsider-researcher.

Findings

The data for this project used data collected data from different groups of people 'to gain multiple perspectives and validation of data' (Carter et al., 2014). The research instruments consisted of a questionnaire and semi-structured interviews with populations of singing teachers and neurodivergent singers.

The Questionnaire

The circulation of the questionnaire was designed to gain an overview of the use of online learning platforms, compared to the semi-structured interviews, which were more focused towards experiences of neurodivergent singers. What this provided was a more detailed timeline of patterns of usage.

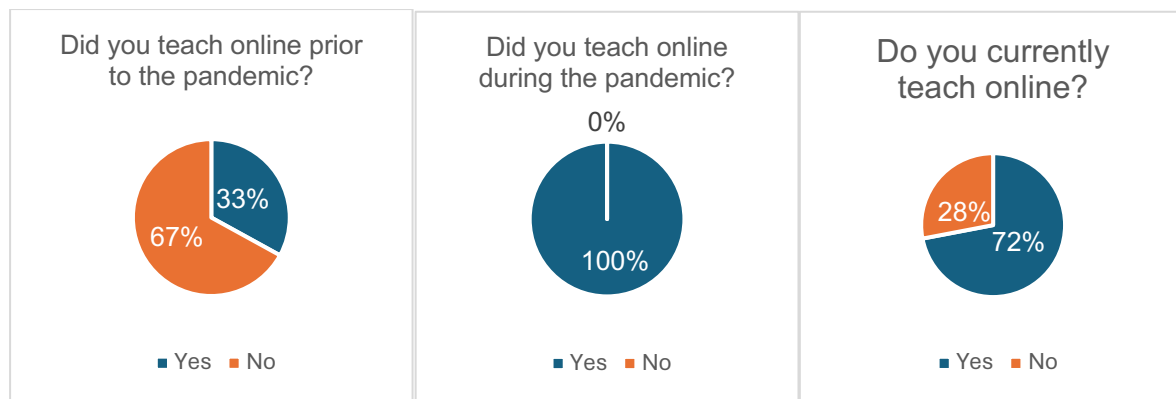


Figure 1. A comparison of online teaching habits pre-, during, and post-pandemic

It is perhaps unsurprising that the COVID-19 pandemic had a fundamental effect on teachers' use of online learning, with 100% of respondents moving to online tuition during this period (Figure 1). However, the high percentage of those who continued to continue to offer online tuition after the pandemic had ended provides a clear indicator of the practice shift that occurred.

When considering student engagement within online learning prior to the pandemic, respondents reported that students/clients were generally engaged in their lessons. A7 responded that 'they were engaged enough to want to have lessons from another part of the country or from another country. They felt the experience to be worthwhile', whilst A13 responded that pre-pandemic, my online lessons were mainly with pro/touring students. These clients were generally engaged and positive about connecting online'. Whilst the respondents' identities were unknown, students were prepared to study with teachers far from their own location, suggesting that these teachers were working at a high level within the industry, which may have been a motivating factor for those singers.

A general theme of the teachers' comments was that engagement during COVID-10 was varied, dependent on the individual student, age, and amount of time spent in online learning in more formal settings. A4, for example, commented that 'younger students were less engaged, but overall engagement was quite good'. The suggestion that those who were in school found extra online lessons more of a challenge be explained by an increased cognitive load (Le Cunff, Giampietro and Dommett, 2024). Whilst online learning was reported to be viewed as a novel way of learning, for some students it resulted in a loss of patience. A13, who was teaching before the pandemic, reported no change in engagement, but merely a change in numbers of students online.

The experience of online learning has led to some students electing to continue to do so. Of those teachers who do continue to teach online, most report that engagement is good, although A12 reported that 'some students show lower commitment levels to online learning now that it is not required'. Since transitioning to a completely online practice in their private practice, A12 had several students discontinue lessons. In

contrast to this, A14 reports that their teaching practice is now almost entirely online, although this participant's practice is at a high level.

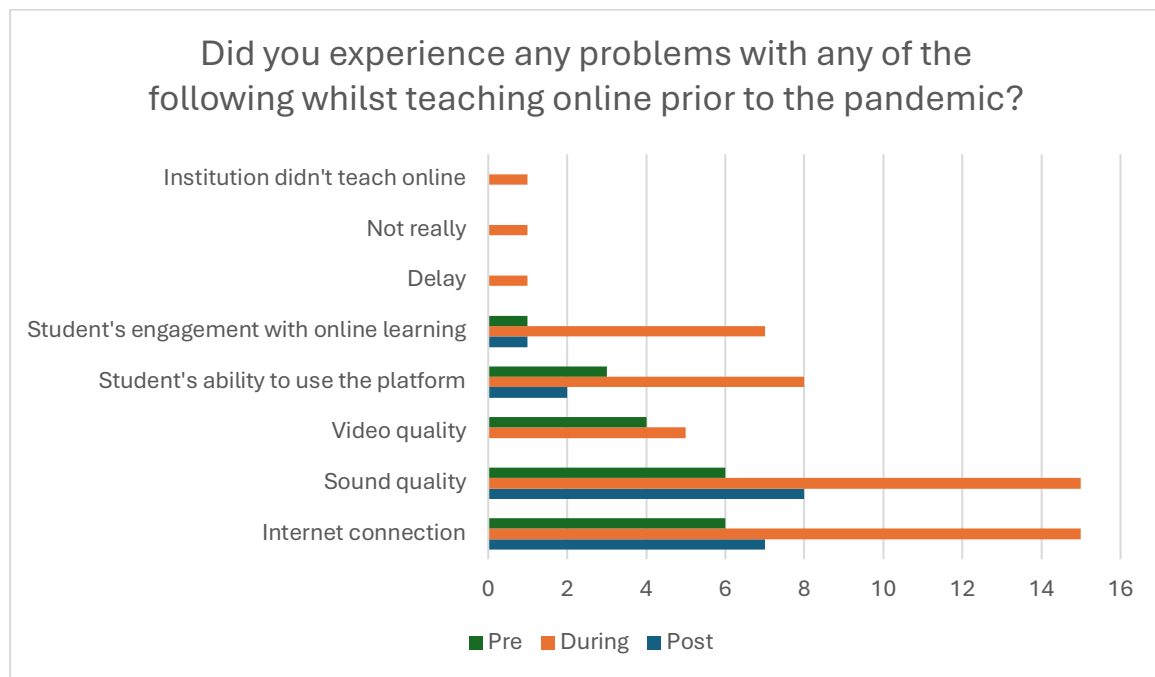


Figure 2 Respondents were asked to divulge any issues with online lessons pre-, during, and post-pandemic

Challenges of Online Learning

The most common difficulty throughout when conducting online singing lessons was with the internet connection (Figure 2). The questionnaire has not ascertained whether the connections that teachers used are wireless or wired, but this would also have been affected by student's connection. A16 reported that lessons sometimes had to be curtailed due to poor connection, but despite this felt that online learning 'was a great tool in these circumstances.'

Sound issues caused necessitated to find solutions. A16 relied on prior knowledge of working with the student, reporting that ‘the sound was often poor and as I had worked with them in person, I had an understanding of where their voices were at and could fill in the gaps as it were, along with some best guesses’. To mitigate the sound issues when online, A16 requested voice recordings from the students prior to the lesson. Adding this asynchronous element to online learning, however, is likely have increased the teacher’s workload, which was a common experience reported by teachers during the pandemic (See, 2024)

In some cases, students improved the sound quality by acquiring external microphones and audio interfaces. However, a factor for the teacher to consider is the potential for inequality, as many young people from lower socio-economic groups and disabled people were excluded by a lack of access to technology (The British Academy, 2022). An asynchronous platform may provide some benefit for these students, as real-time audio would not be necessary.

The use and development of these online learning platforms has developed over time (Fig.3). The relative dominance of Skype in the pre-pandemic era to its obsolescence in current times can be seen, and it is notable that the platform being discontinued as of May 2025 (Microsoft, 2025).

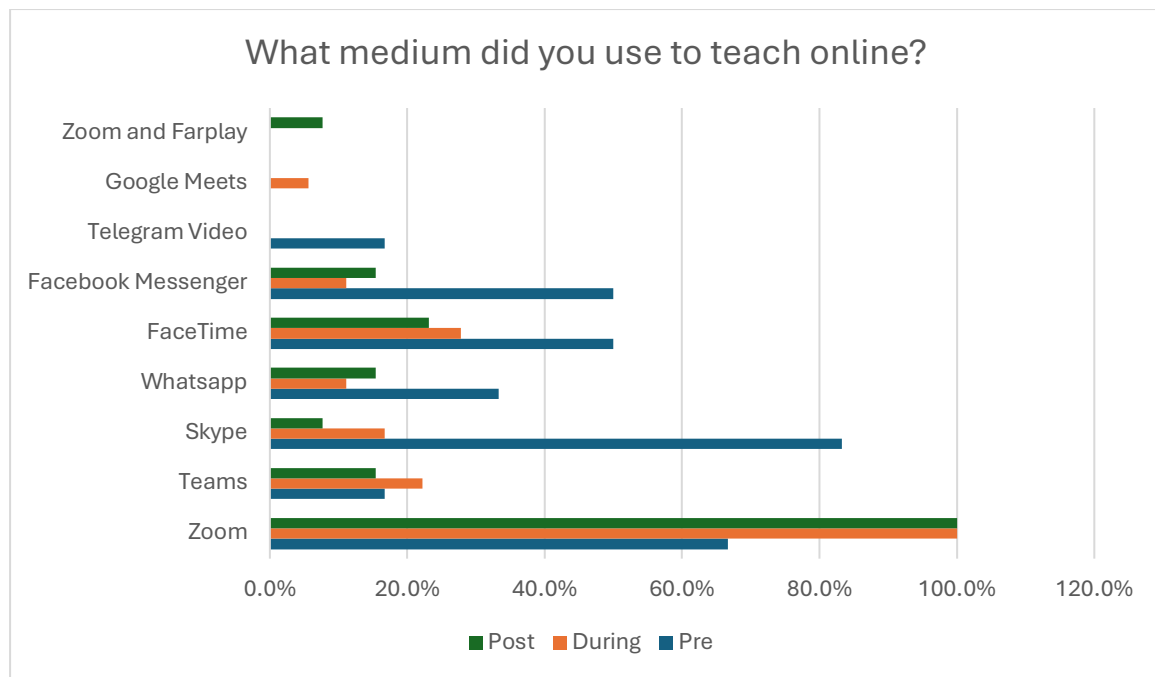


Figure 3 Singing teachers were asked to divulge the online learning platforms they used pre-, during, and post-pandemic

Since the pandemic, the number of teachers who practiced online declined by . demonstrates that most singing teachers who continue to provide online tuition prefer in-person teaching in the post-pandemic period. A7 attributes this preference to sound quality and visibility. S2 agrees that visibility, however they state that they need for eye contact, may be problematic for those neurodivergent students (). A11 cites students' reservations about using the technology as a reason for their preference, which corresponds to ? technical issues to cognitive load. A16 and A12 agree that sound quality is obviously better in-person, giving the teacher a sense of the size of the students' voices.

A12 expresses a preference for online tuition, stating that they ‘find it easier to focus and engage myself’ due to being autistic. This is of interest, as it raises potential issues of competing needs between students and teachers.

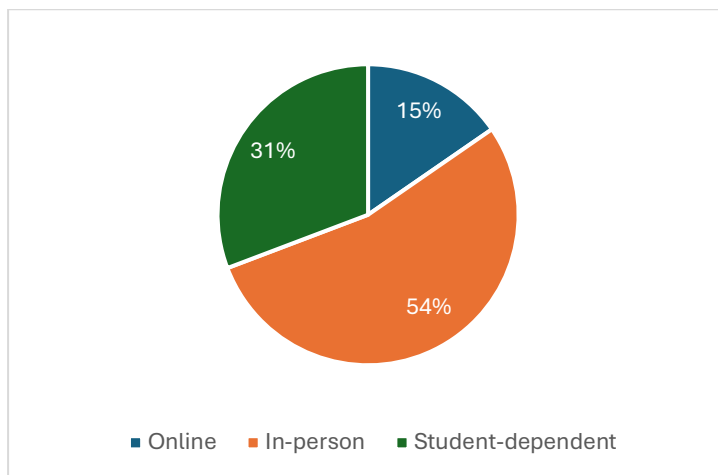


Figure 4 Teaching preferences since the pandemic

The Surveys

Profiles of the Neurodivergent Singer Group

S1

T1 is a 21-year-old female singer. She recently graduated with a Level 6 Diploma in Musical Theatre from a leading performing arts college. T1 is diagnosed as being autistic and having attention deficit hyperactivity disorder. Having initially relocated to a major city to find work in the performing arts, T1 is currently working as a personal trainer. T1 may resume her endeavours to seek employment in musical theatre later.

S2

S2 is a 22-year-old female singer. She is a recent graduate from a UK conservatoire, where she studied musical theatre. S1 is diagnosed with attention deficit hyperactivity disorder and dyspraxia.

S3

S3 is a 24-year-old female singer. She graduated three years ago from a UK conservatoire. Her initial training was in musical theatre but studied classical singing whilst at college. Since graduating, S3 has been working as a singing teacher in her private studio, as well as within several schools. S3 was due to have an assessment for attention deficit hyperactivity disorder within a week of the interview.

S4

S4 is a 20-year-old female singer. She has recently graduated from a leading theatre school, having studied on an actor musician course, which she explains as a musical theatre course with instrumental playing. S4 teaches at a well-known weekend part-time theatre school for children. S4 has a history of being anxiety, with the symptoms being attributed to generalised anxiety disorder (GAD), however, was diagnosed at university as being autistic with obsessive compulsive disorder (OCD) as a comorbidity.

S5

S5 is a 25-year-old female singer. S5 trained at a vocational school before working in an unrelated field for several years. S5 has resumed her studies and is currently

studying at a conservatoire in the UK. Whilst not diagnosed, S5 is currently on a waiting list to be assessed for autism spectrum disorder. However, S5 was recently diagnosed as being dyslexic.

S6

S6 is a 22-year-old singer, dancer and actress. Having studied performing arts from an early age, S6 initially formally trained in musical theatre, before changing the focus of her course to stage management. S5 has historic issues with mental health, is autistic and ADHD, as well as being hypermobile and epilepsy. Believing the professional world of musical theatre to be incompatible with disability, S6 is now training as a peer supporter for neurodivergent people. S6 continues her studies in singing privately and has recently begun to engage in amateur theatre.

Profiles of the Singing Teacher Group

T1

T1 graduated in musical theatre approximately fifteen years ago after studying at drama school. Since graduating, T1 has taught mostly in private practice, but is now beginning to be engaged by drama schools to deliver ensemble classes for actors. Since the pandemic, the majority of T1's private tuition has been delivered online. T1 is also neurodivergent, having received a diagnosis of autism spectrum disorder approximately three years ago. Since receiving the diagnosis, T1 has completed a masters degree, with a focus on the training of autistic actors. T1's thesis explored

the intersection of autistic masking, which 'is the process of intentionally, or intentionally, hiding aspects of yourself to avoid harm' (Miller, Reece, and Pearson, 2021, p.330), and acting.

T2

T2 has a portfolio career, consisting of performing and teaching. T2 is an opera singer, performing mostly in operetta, and is a singing teacher working on undergraduate and postgraduate courses in conservatoire and drama school settings. Although T2's background is in classical, her teaching practice is almost entirely dedicated to the training of musical theatre performers. In private practice, this work is more focused on coaching with professional singers, whilst the focus is mostly on technical work and acting through song. As a singer, T2 works mostly in opera choruses at present, due to her own 'spectrum challenges'. T2 disclosed that she is currently in the process of being diagnosed with ADHD.

T3

T3 has internationally as a singing teacher, working both in conservatoires and drama schools throughout the UK, as well as in private practice. T3 has advised on the creation of several courses in musical theatre at undergraduate level and postgraduate level, and now is the course leader for a postgraduate level course within a UK conservatoire. T3's family have been fostering children for many years, working with many children who demonstrated traits associated with neurodivergence.

T4

T5 has a career as an opera singer and began teaching as a response to other singers seeking assistance. T5 states that 'I wanted to start at the beginning, which a lot of people found a surprise', presumably due to the singer's professional profile. T5 has experience of teaching singing to large groups in primary education, before moving into secondary education in a challenging secondary school. T6 has worked in tertiary education, teaching on a Level 6 diploma course, and currently teachers at both undergraduate and postgraduate levels. T6 was formerly head of singing at at UK drama school. Familial experience of neurodivergence has informed her experiences.

Themes

Four themes emerged from the coding: neurodivergent identity; specific accessibility needs; discussion of previous experience (online); and discussion of previous experience (in-person). Understanding these themes may be essential in providing online tuition on the platform in a manner that addresses need and respects personhood.

Theme 1: Neurodivergent Identity

The Effect of Comorbidity on Identity

The first theme that emerged was that of neurodivergent identity. The right to self-identity as neurodivergent. Within the two groups, there were some diagnosed with a condition that would be classed as a neurodivergence, those who were in the process of being diagnosed with a neurodivergence, and those who would be considered as being 'neurotypical'. In this respect, the entire population of the participants in an embodiment of neurodiversity.

Many groups, such as the National Autistic Society (2025) provide information and support for people with those conditions, however, the issue may be more complicated where co-existing conditions occur. These multiple conditions, or comorbidities (Klykylo, 2002), appeared in the data, with several of the participants disclosing comorbidities during the interviews. S1 reflected on contradictory features of conditions of comorbid conditions affecting her self-awareness, stating

'So, I've been clinically diagnosed with, I'm autistic and I've also got ADHD. So that's a really fun combination because I think that's potentially why it took me quite a while to notice'.

S2's experience of lacking a clear understanding of herself in relation to her neurodivergence was attributed to conflicting features of both conditions. When attempting to gain a better understanding by watching videos on social media, S2 found that not all features of these conditions were relevant. When considering the impact of these comorbidities, S2 found a new identity based on experience, stating 'I'm dedicated for ADHD, so it is the one that has the most impact on my life in terms of living. Dyspraxia kind of comes into play when it comes to processing and stuff.

So, yeah, I think for all intents and purposes, I'm someone with ADHD who has differences in processing speed'.

Questions of identity also emerge in the language in which S2 discusses her neurodivergence, using both 'disorder' and 'differences' originating from the medical model of disability and the language of neurodiversity respectively (Zaks, 2023).

When asked about her neurodivergence, S5 stated 'I'm not yet diagnosed, so I'm, like, on a waiting list to figure it out, but I'm suspected to be on the autism spectrum', but later stated 'I don't know if this is anything but I'm also dyslexic, which I've got my diagnosis this year'. So, if confirmed, the autism diagnosis would mean that S5 also has a comorbidity but hasn't understood that dyslexia is a neurodivergence.

Perhaps, as Walker (2021) suggests, the appropriation of the term 'neurodivergence' by neurominority groups may affect peoples' understanding of what constitutes being neurodivergent. This raises potential issues with participation in research or other fields if dyslexic people don't know that neurodivergence refers to them.

Whilst S5 seemed unaware of her existing divergence, S6 had a clear understanding of comorbidities, having been diagnosed as autistic and attention deficit hyperactivity disorder. S6 states a strong preference for person-first language, but when discussing her conditions states that 'I've got autism and ADHD, a few mental health conditions, and I'm also epileptic', which demonstrates person-first language. Given that S3 advocates and presents at events for autism and mental health, this seeming contradiction may be an issue of nomenclature, as whilst a person may be autistic

(identity first), they can't be a disorder. S6 was also very well-informed about conditions associated with these conditions, such as mental health issues, hypermobility and epilepsy. As S6 is actively pursuing a role which supports and advocates for the neurodivergent person this is perhaps a result of training.

Identity and Advocacy

Positive attitudes towards neurodivergence may be important for self-advocacy and the advocacy of others. S1 discusses how positive conversations between her neurodivergent flatmate and herself are leading the development to help neurodivergent people with organisation and emotional tracking. S1 states that the app would be for 'them [neurodivergent people] and not for the general population' is interesting as being one of exclusion of neurotypical people.

S2 and S4 highlight the benefit that diagnosis can bring in advocated for their own needs. S2 stated

'I think I was able to advocate for myself in a room with a teacher at that point, to be like, "I don't understand what you've just told me because of my dyspraxia, can you re-explain it?'

S4, whose college facilitated the diagnostic pathway, stated

‘And I found that since having that kind of diagnosis to tell people it's made my life a lot easier in terms of in professional environments, just being able to kind of outline my boundaries and not just seem like or not feel like I'm just being difficult’

This feeling of awkwardness about their own needs is also expressed by S6, who began to unmask after receiving her own diagnoses. The process of diagnosis ‘shifted a lot of my perception. Like a lot to do with that mental health crisis was the sheer amount of workload that I had in my last year changed everything’.

For the singing teacher to support and be responsive to the needs of students before, during, and after the process of obtaining a diagnosis is invaluable in supporting the student finding their new identity as a neurodivergent person. However, the singing teacher must also address the developmental needs of the neurodivergent singer in the voice studio, being it online or in person.

Theme 2: Specific Accessibility Needs

Examining needs

The theme of making online learning accessible to neurodivergent singers arose from the interviews. What became clear was that neurodivergent singers were already demonstrating an awareness of their own ways of learning. Examining these

needs in relation to the Universal Design for Learning Framework, which purports to be able to include all learners, may be relevance when designing the framework for proposed online learning platform.

Providing multiple means of engagement

S1 outlines issues with procrastination in tasks that are set by another person, explaining that she experiences 'just that mix of hyper-focus to just complete inability to do the thing. So that once I'm in it, I'm there and I can get more work done in an hour than some people can get done in a week'. This emphasises the need in providing a means to promote engagement. For S1, context is key to counteracting procrastination. She states that

'if I don't know what's coming I'm kind of like, oh, oh, I don't want to get started and again, as well...like context. If I know why I'm doing something, I'm much more likely to do it because I'm doing this thing because this is the outcome'.

So whilst procrastination may appear pervasive in everyday life, such as the completing her first tax return, S1 outlines the strategy of 'body doubling', both in-person and at distance. In terms of the UDL framework (CAST, 2018), this approach could be argued to 'foster collaboration and community (8.3). For the online platform, this could take the form of a discussion board for users, although this is will need moderation.

Providing multiple means of representation

The neurodivergent participants expressed a range of preferences for how information was presented to them, which aligns with UDL's option for 'providing multiple means for presentation' (Cast, 2018).

S1 utilises accessibility features on her mobile phone to ameliorate challenges with processing text. She stated

"I think, when it comes to online learning specifically, I find reading things more challenging than listening or watching. I even know myself, like on my phone, if I have a piece of reading I'm supposed to do, I will, like, copy it all and then press 'speak'".

S2's account concurs with the experiences of S1 in the benefit of audio to promote learning, which is suggested in UDL (2018) under the subheading of 'offer alternatives to visual information' (1.3). She stated 'I would personally prefer something that I can just listen to actually rather than pull up a whole video'.

S3, in stark contrast to S1 and 2 reports finding verbal instruction challenging to process. These challenges were particularly noticeable in high pressure situations, such as in masterclasses, where

'I would have that feedback verbalised to me and I'm like, "okay, I really don't know what it is you're saying, and then because. And then, because you're under the pressure, and you've got lots of people watching you, you kind of just wing it. But

then winging it either meant that I did it wrong, or I did it right, but I didn't know how I did it right' (S3).

To meet this challenge, S3 advocates using both presentation notes to use whilst the recording was playing. In this respect, an asynchronous learning platform may be helpful, particularly given her stated preference to receive notes in advance of the session. An asynchronous platform may also help those learners who need extra processing time, as S3 reporting regarding sight singing.

'Providing options for comprehension' (CAST, 2018) by providing 'options for supplying background knowledge' (CAST, 2018, 3.1) is relevant to meet the needs of S2 and 3, both of whom express an interest in understanding the anatomy and physiology. S2 states that

'I like to be told exactly what's going on anatomically and sometimes a visual aid can be useful as well...if it's ground in actual, like, it it's science'y, I'll probably get it'.

S2

S3

S4

Providing context of pitch range by seeing the teacher AND where the pitches were on the piano

Spoken and/or visual explanations

1911118

So I, I oftentimes I'm like wish I just had a recording to like remember what was said in the session.

S5

Recordings are vital as a dyslexic singer

Like I would say I use that more than like recapping the information and then usually also I like have like a database for like singing exercises that I started to create last year. Like an Excel spreadsheet. So then I'll put it into my spreadsheet.

S6

Teacher's accommodations

Providing multiple means of action and expression

Participants expressed a range of views on accessibility needs in an online learning platform, which appeared relevant to subsection 4.2 of UDL (2018). Participants appeared proactive in making some of these adjustments for themselves, so an awareness of strategies that have been successful is likely to be useful for the developer of an online learning platform to consider.

S1 believes that the platform should be available on mobile phones to maximise productivity. She states

'we (her flatmate)... were talking about not just monitoring when your energy level drops, but also monitoring when you...are in a creative burst...I don't know when that's gonna hit. And so, having that be like, "oh, my phone's in my pocket. The energy is hit. I'm going to do it while it's on my mind'.

For S1, ease of navigation is related to productivity, stating that 'if starting takes me three, four minutes, I'm more likely to do it'. S5 concurs, stating

'like, don't know if this makes sense, like the tourney of your time on the site. Like,...if it's confusing what I have to do next, where I have to go. But that's just kind of web design in general. I think just having a clear piece of information. No gimmicks'.

These findings concur with those of Le Cunff, Giampietro, and Dommett (2024), where respondents reported that technical issues and dense onscreen content caused a loss of patience and an ability to focus on the task. The design of the platform needs to ensure that attention to pace, and density of information is considered if the platform is to be accessible.

The use of coloured overlays and paper is common in providing reasonable adjustments for dyslexic people (British Dyslexia Association, 2025). S2, although

not diagnosed with dyslexia had inadvertently discovered a preference for blue paper. She states that

‘TEACHER had printed a whole load of pink and blue ones, just on the off-chance that someone would need them, and when I was presented with two options and I looked at a pink copy and I looked at a blue copy, I was like “oh, that looks really clear to me...I think it just quiets the noise’ (S2).

In contrast to S2, S5 reports not needing such adjustments, despite being dyslexic. She states that ‘I don’t personally use colours...I actually just find it easy to read on white’. However, this appears to be dependent on the amount of text present, as later, S5 comments that

‘I don’t use it very often, but if there’s a big chunk of text and I’m finding it hard to like concentrate. I think that’s something that you can build into a site but you can obviously, like, if you know about it, you can get the extensions. So yeah, potentially that’s like an accessibility thing of just having like text-to-speech if it’s written information’.

The issue of text is a frequently occurring issue. S1, in relation to online learning, reported finding reading difficult due to the need to stim or fidget. She states

‘I find reading things much more challenging than listening or watching...If it’s ,like, learning, I look at a piece of paper and I just go “I’m reading this. None of it is being

taken in"...whereas when I'm listening or watching I can, like, paint my nails, I can crochet, I can do something else to fidget while I'm listening.

S2 utilises both audiobooks, with the written book, as well as screen readers for university. However, her ability to concentrate appears to be special interest related. She states

'I think I love them, yeah, and they can usually keep me if it's a topic that I love...But if it's something I need to read for university or something, I had a screen reader and would have to literally listen to the screen reader and stare at the screen to remember anything'

The topic of motivation was common to both S1 and 2, with S1 choosing to access written information when a lack of wireless connection makes other forms of communication inaccessible. This supports Le Cunff, Giampietro and Dommett (2024), who found that acquiring concepts and motivation to be a common source of increased cognitive load amongst neurodivergent people. Respondents reporting using recordings, often replaying sections, to assist with the acquisition of information (Le Cunff, Giampietro and Dommett, 2024). A potential online platform would be beneficial for this, as the self-directed nature of the platform would 'optimise individual choice and autonomy' (CAST, 2018).

S3 found that 'loads of words that maybe don't have any bold bits or key bits' would be something that would make a website unappealing. S3 found a structured approach to the presentation of information to be useful, stating

'Something that TEACHER used to do was, if she ever gave me anything written, she'd give me the heading of what it was that it was about, and then in a box be a brief overview of what this page is, basically, and then then five key facts of what you would need to know, and then all the other information below it. So then it was like, okay, in my own time, then I can read the proper bulk of it, but quickly I can pick up the other bits of what...it's about as well'.

For S5, as a dyslexic person, the presentation is crucial to engagement. She states

'I mean, for me, it's just about having clear information. Like if a webpage is too busy or too overwhelming, especially as someone who like can't read that well. Like, it's very clear...on your phone or something, you can like switch to easy read or something...but I mean sometimes it doesn't really work that well because it would remove the images or whatever. Yeah, I mean I think for me it's just like being clear and...to be able to, like, easily understand'.

S6 concurs with S5, considering that motivation is affected by too much content.

She states 'but short form content for sure is something, like, I steer away from anything that's too long because it feels too much like an investment.

From the neurodivergent singer accounts, accessibility needs vary greatly between individuals. When considering accessibility features, the widest variety of options need to be available to the singer if the singer is to engage with the platform.

Theme 3: Discussions of Prior Experiences (Online)

The questionnaire (Figure 1) revealed that 100% of respondents moved to online learning during the COVID-19 pandemic. This abrupt transition provided teachers with many new challenges pertaining to managing unfamiliar learning platforms (Sing Yun, 2023). As COVID-19, at the time of writing, was five years ago, developments in technology and their ability to impact upon the singing lesson made this topic relevant to both teacher and neurodivergent groups.

Adapting for Technology

The questionnaire revealed that internet connection was consistently problematic before, during, and after COVID-19. T3 outlines the effect that this can have on the perception of social cues for all students, regardless of neurotype, stating

‘I think that the immediacy of a lessons is quite important. So I think that even when you’re giving feedback, there’s like...a social perception thin that if you wait a couple of seconds before you go “that was really good”, that has a completely different connotation than the second that somebody’s finished something going “well done”.

S4 concurs with this experience, stating

‘So I’d have the track and I’d be singing the song, and then I finished and there’d be an awkward three-second pause...I stopped myself every single time. I was like “she’s going to say that I was awful. Like, every single time without fail”.

To mitigate the potential for a neurodivergent student to be confused or distressed, then, is an imperative. To achieve this, T1 states ‘I used cable because the internet wasn’t super reliable. I’ve got delicious fibre broadband where I am now, so I’m using wifi’. T3 suggests that enabling a stable connection through hard wiring means less adjusting of the singing teacher’s settings. T3 states

‘I really, I make a point of trying to kind of sort that out right at the beginning so that the rest of it feels like a normal lesson because I think that tends to yield the best results for me’.

This question of connectivity was also viewed to be problematic in the questionnaire. 100%, 78%, and 46% respondents experiencing issues before, during, and after the pandemic respectively, however, the numbers of singing teachers practicing online also decreased. Whilst wired connections appear to be beneficial in synchronous online learning (T3), an asynchronous platform may circumvent the need to do this. However, technical problems may increase cognitive load (Le Cunff, Giampietro, and Dommett, 2024). Applying T3’s principle of sorting technical issues from the outset

could take the form of making recommendations at the time of booking onto the platform.

Audio quality was also an area of concern in the questionnaire. These concerns were shared by T2 who has modified her practice due to these challenges. She states

'I think given that I find it quite difficult really hearing the absolute detail online, so I prefer coaching, which actually might not be as useful for somebody that was neurodivergent as doing something that's super technical'.

However, the experience of T4 suggests that a preference for focusing on repertoire can be student-led, stating that 'a lot of the students that I've had online have preferred to have a warmup recorded to do before I start. They find it easier just to be instructed on the song'.

T1 believes 'since the pandemic, their (the platforms') audio settings have got better. And they keep updating them, which is kind of annoying because you have to keep figuring it out. But it's worked quite well for me'. T1's comments reflect the questionnaire (Figure) which show that student familiarity with the software was sometimes problematic. However, compulsory online tuition ended with the cessation of lockdowns, and so whilst practitioners such as T1 only work online, students may not do so as frequently. Unexpected changes can be problematic for autistic singers(), which the practitioner must be aware of. However, to persist with getting the correct settings can pay dividends, as T1 explains:

‘And, if I’ve got my earbuds in, then I can hear quite, you know, if the settings are correct, then I can hear really clearly without like distractions. And that’s super helpful for me. And I always encourage students to have, like, the proper settings and decent sound on their end as well.’.

T3 describes himself as ‘a bit of an audiophile’. Whilst in agreement with T1 about the necessity of clear sound, he emphasises the need for the student to have the same experience. He states

‘I also think the higher the quality of audio I think is really important to me when I teach lessons online, obviously, because the more clarity we can hear their voices with, the better. But also from the point of view of me giving it back to them, is that a lot of my neurodivergent singers are brilliant mimics...So, if we have got a nice low latency audio and I’m able to kind of give a fairly high quality model of the sound that I’m looking for, then that pays a lots of dividends in the end. I think that kind of, that can move things on much, much quicker, a more natural pace’.

The pace of the lesson can be affected when using accompaniments. T1 states that ‘obviously things take a little bit longer because we’re working asynchronously, and...we’re playing exercises and stuff and it’s sort of a call-and-response type situation, which for me is fine. T4 states ‘I don’t know if that’s a common thread, but it’s...the online exercises, because it’s that call-and-response thing...And then soon as Zoom does a blip or something, then we almost have to start again because...we’ve lost the continuity’. With regards to piano accompaniment for

repertoire, T1 appreciates the student having control over the accompaniment, stating

‘I don’t worry about it too much. I’m not the world’s best pianist, so I’m not going to be accompanying anybody anyway. So, it works a lot better for me to have, if we’re working on rep, then they have their backing on their end. And it also frees me up to be able to listen to them more closely, because I’m not working about playing or anything like that’.

In the questionnaire, A15 states the belief that students became more self-sufficient during online learning. However, singing teachers needs to maintain an awareness that, for some, the transfer of responsibility from teacher to student may impact on cognitive load. S2 states

‘And then obviously there was the added technical aspect of like having to have backing tracks and having, like, or piano recordings from the or whatever...it just made it way more complicated than it needed to be. Like, yes, okay, it was from the comfort of my own home, but there were so many other moving parts that I had to manage, and it was kind of difficult to stay on top of it’.

The questionnaire and the singing teacher interviews both highlight issues of technology, but some singing teachers are finding ways around these problems, insofar the current technology allows. Whilst these responses demonstrate the importance that the teachers place on removing barriers to participation for their students, consideration needs to how address the teaching of neurodivergent students.

Approaches to Teaching Neurodivergent Singers Online

Some neurodivergent teachers have made the choice to disclose their diagnosis within their practice. T1 states

‘I am now trying to practice radical visibility, being openly autistic to my students and going “hey. This is how I am. This is what I need to function. This is how I like to work”. And that, hopefully, gives them an invitation to open up about what they need as well. And I find that kind of works. And I’ve had a few students...come to me and go “hey, you know, I think I’m autistic. What do I do’, which has been really lovely’.

The researcher notes that, while anecdotal, T1’s experience of being visible is reflected in his own practice. Whilst this may take the form of discussing it at the beginning of the academic year, or on an individual level, the use of a sunflower lanyard can choose to be a subtle prompt for students to begin a dialogue about their own needs. S2, having studied briefly with the researcher during her undergraduate training states ‘

T1 and 3 both compare their online and in-person offerings when working with neurodivergent students. T1, who is an autistic person, states

'no, I don't think there's much difference, to be quite honest. For me as a teacher, I find...I prefer to teach online one-to-one because there's a kind of focus there'.

T3 concurs but generally has experience of their students in a face-to-face setting.

He states

'In terms of practicality of the lesson, it doesn't change from from I've said about in-person. And I think that because most of the people I teach, they're not fully online singing...But 99% of singers I teach have met me in person, or work with me in person as regularly as they can. So they're more of a hybrid learner. And so from that perspective, I tend to find that...the more that you just keep consistency between online and in person, the better that person understands what's coming and knows how to engage with the work'.

In terms of consistency, S2 states

'I mean, honestly, I teach as if everybody is (autistic) because that's what makes most sense to me as an autistic practitioner, and I'm really reflexive with the students, always checking in "hey, do you understand that? If you don't, it's my fault not yours. You're not responsible for your understanding".

What is also significant about this approach is the shifting of blame away from the student to the teacher, however, S5 goes on to state that

'Sometimes, I use need to use different cues. So sometimes, sometimes there'll be verbal cues, sometimes there'll be visual cues, So I'll show them what I mean.

Sometimes I'll need them to do some sort of self-tactile cue, so they can feel what's

going on and it sorts of just depends on the student. It's really, really individualised. Some people don't like touching themselves, and that's fine'.

By providing options for the student to access information and techniques in different way, this could be considered an application in practice of Universal Design for Learning. Whilst Boysen (2021) criticises the validity of UDL in relationship to learning styles, S2's approach, when combined with the many options for accommodations found in Theme 2, these multi-modal approaches are needed and were asked for by the neurodivergent participants. Therefore, UDL may have practical value, even if some of the theoretical underpinning is challenged.

Theme 4: Discussions of Prior Experiences (in-person)

An awareness of managing one's own neurodivergence may be helpful in considering how reasonable adjustments could be applied to others. S2 states 'I also have a problem with instruction, with geographical instruction....I get lost very easily, so you might need to come and find me. And it's not mean. That's not about accepting responsibility, because I try very, very hard'. T2's strategy of walking through and mapping out staging provided a solution to her challenges. She says of the experience 'so, I'm really, really sensitive to...students who that the same difficulties...I really, really do find strategies to cope with it'. T4 reports adopting a similar determination in helping a student who was having issues with pitching. After several weeks of perseverance, T4 states

‘And then we had an absolute breakthrough because one day, I just put my hand above and I was like, you know, it just goes. And she just literally watching my hand. And she sang in tune for about three notes...And I said “oh, I thought you didn’t like my hand?” She says “it’s making sense because...you just had one finger sticking out. So I just followed it. So it wasn’t an image, was was just a finger”’.

In the context of UDL (CAST, 2018), S2 provided an option to aid perception by offering a ‘way of customising the display of information’. In the case of S4, it could be argued that the singer ‘highlighted pattern...and relationships (3.2, CAST, 2018) when developing pitching skills. However, in ‘decoding...symbols’, by explaining the role of gestures with the finger to S2 that both became more resourceful and knowledgeable about the solution, which achieves a goal of developing expert learning in the UDL framework. However, for the designing of the online learning platform, this would raise the issue of how to engage this learner whilst not being a distraction to another.

However, in contrast to this approach, S3 explains that her singing teacher, whilst highly respected by the student, couldn’t or wouldn’t adopt different strategies to help her to achieve. In the context of breathing, S3 explains

‘I felt like I was doing it and she just adamant that I wasn’t doing it. So, then it was like, “okay well, there’s clearly a discrepancy because how you’re explaining it and me thinking I’m doing it, and the result of me doing it is not what you want”. And yet I was kind of met with a lot of like, the language wouldn’t be changed. I obviously wasn’t achieving the results’.

A consideration of T2's experience in the context of the 'sensory star' (Shore, 2004, p.19) may be one explanation of the disparity between teacher and singer's perceptions of the success of the exercise, if the cause was an issue was a proprioceptive sensory violation Shore, 2004, p.19). Yet the lack of options for providing 'options for comprehension' (3) (CAST, 2018) may well impact on student motivation by not 'recruiting access' sustaining effort and persistence'. According to CAST (2025), 'it is important that learner have multiple models and scaffolds of different self-...assessment techniques so they can identify and choose ones that are optimal. This raises the question of whether there is a need to provide practical training for singing teacher who may be reticent or unaware that these needs exist.

On the nature of training, T2, whilst respecting the rights to family privacy, describes part of her training as being at the 'University of Life'. She says of the experience

'and it...was so short, but it was something that I know I'm not...I attended this talk given by an autistic woman to teachers. She was communicating to teachers about how best to response, communicate and teach autistic students, but from her specific experience...She was so articulate, obviously very, very bright. But..., as she was moving through the lecture on autism and giving us an overview of, you know, terminology and all that kind of thing. She, she was going into that detail about her own experiences at that time.'

Heath (2024), although in the context of autistic literature, concludes that meaningful support for autistic people can be fostered when their voices are included in

discussions of issues that are related to them. While T2 debated whether the training she received was really training, the contribution of this autistic advocate fostered curiosity about the topic.

When asked about the training experiences, T3 reports having none. He states that 'all the training we get is different kinds of EDI, but it's not neurodivergent students. All the safeguarding training I've done, nothing is about how to adapt pedagogy or approach for neurodivergent student'. T3, like T2, has informal experience of neurodiversity, stating

'I think I'm at a slight benefit to the average teacher because my parents were foster carers, so we had a lot of training on how to deal with different kids. And quite often, neurodivergency was just one part of a much more complex series of puzzles that we had to solve when we had kids in care...I'm not an expert at any of this, but I think that there's...probably some kind of nurture link with regards to certain kinds of neurodivergent behaviour. And that's not to say that that's an explicit thing, but that you would find, I think you would find if you look at kids in care, you would find an incredibly high percentage of them would pass some kind of tests for certain neurodivergent behaviours. And I think it's potentially to do with trauma response as well... Obviously don't think that all neurodivergence is that'.

However, despite being welcoming of training opportunities, T3 expresses concern that training may not reflect the holistic nature of his experiences. Of this, he states

I think you've got to treat somebody as an individual and it's only when you do that that you can, you can really help them. And there's no amount of training that can really set you up for that, especially in what we do as singing teachers. [T suggests that courses can't replace learning about the individual, which is essential in helping them]I don't think like. Like I. I am the amalgamation of all of my life experiences. Experience doing what I do. And so like, you can't boil that down into a course like you can...That's not one day of like sharing experience. That's like, how do I bottle up like 20 plus years of doing what I do at like an HE level? Like, it's, it's, it's kind of like it's insurmountable, I suppose. And so, yeah, it's a puzzle that I have no idea of how to solve it'.

T4 shares T3's concern about a lack of safeguarding, stating 'I just feel there is a need, especially in the educational environment that no matter what you teach, there should be some sort like we do safeguarding training. There should be something that's compulsory that we do so that we gain a better understanding'. Whilst having no formal training, parenting a child with an unspecified sensory processing condition has led to the need to advocate for her daughter, lest her emotional state is misconstrued. T4 states 'a lot of people mistook it as anxiety and things like that and thought she was a timid child. And we used to say...it only happens when she's so happy. So, like when we say we're going to theatre or when she's going to watch a show or whatever it is, she's sitting in the audience like this. As soon as the show starts, she's there. But we, people say, oh, she's moving her hands. I'm like, yeah, she's happy, she's not anxious, she's not worried or, you know, it's, it's kind of a way for us'.

When comparing the accounts of T2, 3, and 4, it is evident that all are receiving most training through means other than formal training courses, yet the interest in these kinds of courses was also evident. So, whilst this study aims to provide opportunities to provide neurodivergent singers with opportunities to learn, there may also be the scope to work with singing teachers to provide opportunities to consider and develop their practice.

Conclusions

This study aimed to evaluate the efficacy of online learning platforms for teaching neurodivergent singers. Whilst the original intention was to build the platform for testing, as the complexity and variety of neurodiversity emerged, it became clear that this would require a greater timescale than allowed for. Competing and contradictory reasonable adjustments mean that the platform needs to be highly customisable, but without increasing cognitive load. Despite not developing the platform, several key findings emerged.

Both teachers and participants overwhelmingly supported the idea of an online learning platform, however, a completely asynchronous model was not universally agreed to be useful.

Neurodivergent singers' views of their own needs generally aligned with the Universal Design for Learning guidelines, although not all options were met. A key issue for the designer of the proposed asynchronous platform would be how to ensure that service users could get feedback on techniques or approaches featured

on the platform. In this respect, it is concluded that a blended approach would be needed, or some form of online activity that users could elect to either participate or observe in a manner that befits their needs.

Interviews with the teachers, as well as participant accounts that some teachers are not implementing reasonable adjustments suggests that there is a need for training that is focused on neurodivergent singers, both at institutional level and in private practice. The teachers who were interviewed clearly value their work with neurodivergent students and are attempting to find ways of access whilst navigating the 'swampy lowlands where situations are confusing 'messes' incapable of technical solution (Schon, 1983, p.42).

Limitations

This study has several limitations, the first of which concerns sample size. This study recruited six from a possible ten that were suggested during the ethics clearance process. Given the nature of neurodivergence as an umbrella term (), this is unlikely to represent the community as a whole.

That one participant didn't seem to realise that dyslexia was classed as a neurodivergence may help to explain the lack of participants, as it is possible that people may not realise that the study applied to them in the same way as conducted a study on people with the same condition might do, for example, with autistic people. There is also the possibility the term 'neurodivergence' may have become synonymous with autism or ADHD for some people, as suggested by Walker (2021),

The lack of male participants amongst the neurodivergent singer group is also a weakness of the study due to a lack of generalisability to the whole population. In a systematic review conducted by Loomes, Hull and Polmear Locke Mandy (2021), it was found that the ratio of males to females with a diagnosis was 4:1, although the number of females may be at a disadvantage in the screening process.

Using the social media outlets to recruit participants is only successful if the potential participant sees the posting or advert. The participants who did see the advertising had all graduated or were engaged in a course of study at undergraduate level. This suggests the advertising was not seen by those with higher support needs.

Therefore, the universality of the Universal Design for learning cannot be completely considered to have been addressed.

Whilst a minority, the percentage of singing teachers that stated that they were teaching online prior to the pandemic of 2020 was surprising. Again, the relatively small sample size of eighteen participants may have affected these results.

Recommendations

Training opportunities need to be developed to assist singing teachers in developing their practice. Neurodivergent singers can provide valuable insights, both to the teachers, but also to the designers of such courses at every stage in their development.

Future work in this field could include working with neurodivergent people with higher support needs to fully explore the benefits of Universal Design for Learning, as this was not addressed in this study.

The findings of this study will now lead to the designing of a learning platform to support neurodivergent singers, with the added awareness that this is an iterative process to engage.

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