

## Impact case study (REF3)

<b>Institution:</b> Ulster University		
<b>Unit of Assessment:</b> Music, Drama, Dance, Performing Arts, Film and Screen Studies (33)		
<b>Title of case study:</b> ICS1 Inclusive Creativity – driving inclusion in music for disabled artists using creative technologies		
<b>Period when the underpinning research was undertaken:</b> 2003 - 2020		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Prof Frank Lyons Dr Brian Bridges	Professor of Music Lecturer in Creative Arts/Creative Technology	2003 - present 2008 - present
<b>Period when the claimed impact occurred:</b> 2014 - 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> N		
<p><b>1. Summary of the impact</b></p> <p>This case study is focused on impacts arising from the development and application by Lyons and collaborators of his Inclusive Creativity concept, which aims to level the playing field in performance and composition for disabled musicians by developing new creative technologies and methodologies for their use.</p> <p>Impacts include:</p> <p>(I1) influence on creative practice of artists with and without disabilities;</p> <p>(I2) development of accessible future-focused creative technologies for use by artists;</p> <p>(I3) personal and professional development and enhanced artistic achievement of artists with disabilities;</p> <p>(I4) influence on strategy, curriculum innovation and professional training in the conservatoire sector;</p> <p>(I5) cultural and creative policy transformation.</p>		
<p><b>2. Underpinning research</b></p> <p>The underpinning research comprises practice-based outputs, position papers, technical papers and conference presentations across three related strands: Strategies for Inclusive Creative Practice; Accessible Hardware and Software Interfaces; and New Repertoire for Inclusive Ensembles.</p> <p><b>Strategies for Inclusive Creative Practice</b></p> <p>Lyons' research investigations have been conducted primarily through high-profile original compositions (<b>R1-R3</b>), some of which were written specifically for inclusive ensembles, developing innovative technology-focused strategies for inclusive creative practice. These compositions have received numerous international performances facilitating iterative research investigation and multiple findings. The strategies were driven specifically by research findings confirming optimum approaches to the role of improvisation, use of gesture as communication, the co-creation of material, and integration of acoustic and digital instruments.</p> <p>As testbeds for this practice-as-research, Lyons has founded and directed three important and innovative inclusive ensembles: the Wired Ensemble (2000); Acoustronic (2015) and NonZeroSum Ensemble (2017). These groups feature disabled and non-disabled, professional and amateur musicians performing on acoustic and digital instruments. In 2014 Walled City Music Trust and Ulster University collaborated on proposals to the Calouste Gulbenkian Foundation and British Council, securing approximately GBP100,000 to establish and run Acoustronic and to support touring (<b>G1, G3</b>). The group Acoustronic is unique, performing challenging new work in a range of renowned mainstream music venues, for example in concerts at the Walled City Music Festival in Derry in June 2017, at Richmix in London in September 2017, in the Virtual Systems and Multimedia International Conference in Dublin in November 2017 and in Calouste Gulbenkian Auditorium in Lisbon in January 2018. One key recent major composition by Lyons, <i>NonZeroSum</i> (2017) (<b>R2</b>) for inclusive ensemble featuring string quartet and five digital instruments, was commissioned with funding from the prestigious PRSF Beyond Borders scheme (<b>G2</b>).</p> <p>Restrictions imposed due to Covid-19 have driven Lyons to investigate new methods of inclusive music-making in real time using communication platforms such as Zoom through weekly online rehearsals with disabled musicians in the period May to December 2020. Initial</p>		

findings from this latest research activity were presented in an invited keynote and two workshops at the EASPD International Conference on Arts and Inclusion on 14 and 15 October 2020, and in a keynote at University of Graz 'Music and Inclusion Conference' on 11 December 2020, and have formed the basis for a newly commissioned piece, *Zoom Time*, to be premiered at the Walled City Music Festival, in 2021. (G4)

#### **Accessible Hardware and Software Interfaces**

Lyons has designed new, and adapted existing, accessible hardware and software interfaces for music composition and performance for disabled musicians. He has led a number of research teams at Ulster, which since 2014 have produced several new accessible digital instruments and apps (R6).

Lyons, McCloskey and Bridges published an influential peer-reviewed paper based on this work in the New Interfaces for Musical Expression (NIME) 2015 proceedings (R4) *Accessibility and dimensionality: enhanced real time creative independence for digital musicians with quadriplegic cerebral palsy*, which has been cited in papers on accessible musical interfaces at international conferences (ICMC, NIME) and the *Journal of New Music Research*.

Lyons' *NonZeroSum* (R2) pioneered the use of two audio-visual apps that have been used in performances in Derry, Dublin, London and Lisbon.

Bridges et al. explored VR (virtual reality) in performance systems design in a peer-reviewed paper which has informed recent work using VR in inclusive performance environments (R5). Invited presentations have been given by Lyons and collaborators Lewis Smith and Bridges at Inclusive Creativity Symposia in Dublin 2018, Gothenburg 2019 and the Surroundscapes Symposium, Belfast in 2019, demonstrating developments in the creation of VR environments for inclusive music-making. (G4)

In summary, research findings from this strand related to maximising creative expression from digital instruments (R1-R3), methods to evaluate musicians' preferences for bespoke, customised or consumer digital instruments (R2, R3), the potential of immersive environments (R5) and the efficacy of apps to generate visual stimuli to guide musical improvisation (R2).

#### **New Repertoire for Inclusive Ensembles**

In response to the success and wide dissemination of compositions written specifically for inclusive ensembles, such as *NonZeroSum* (R2), Lyons has been commissioned by a range of internationally renowned music organisations to present at conferences and symposia on the importance of developing this new repertoire. He has also been invited to facilitate research-led workshops for emerging and established composers in the complexities of writing new music for inclusive ensembles. These events have included Setúbal Music Festival in Portugal 2016, Walled City Music Festival in Derry 2017, St Magnus International Festival in Orkney in 2015 and 2017, Calouste Gulbenkian Partis Festival in Lisbon in 2018 and Share Music Sweden in 2019. In summary, key research findings produced by activities in this strand include new guidelines on notational strategies and original approaches to timbral colour provided by combinations of digital and acoustic instruments.

**3. References to the research** Outputs can be provided by Ulster University on request.

#### **Practice-as-Research:**

**R1.** *The River Still Sings* (2013, Lyons and Moore) for Piano Trio, Narrator, Video and Live Electronics. Premiered at the City of London Festival, by Fidelio Trio and James Nesbitt in June 2013.

**R2.** *NonZeroSum* (2017, Lyons) for string quartet and five digital instruments, premiered at the Walled City Music Festival by NonZeroSum Ensemble in June 2017. Submitted to REF2021.

**R3.** *Hex 2* (2020, Lyons) for bass clarinet, SABRe, live sound processing and soundtrack. (Online premiere due to Covid). Submitted to REF2021.

#### **Papers:**

**R4.** McCloskey, B., Bridges, B., and Lyons, F. (2015) 'Accessibility and dimensionality: enhanced real time creative independence for digital musicians with quadriplegic cerebral palsy.' *NIME Proceedings*, Louisiana State University, pp 24-27.

**R5.** Graham, R., Bridges, B., Manzione, C., and Brent, W. (2017) 'Exploring Pitch and Timbre through 3D Spaces: Embodied Models in Virtual Reality as a Basis for Performance Systems Design.' *NIME Proceedings*, Aalborg University, Copenhagen, pp 157-162.

**R6.** Lyons, F. (2006) 'Sonic Art: Opportunities for a Level Playing Field for Disabled Composers and Performers'. *International Journal of Technology, Knowledge and Society* 2/2, 129–134.

**Grants: G1:** F. Lyons, *Sharing the Stage*, Calouste Gulbenkian Foundation (March – Sept 2015), GBP97,000. **G2:** F. Lyons, *Beyond Borders*, PRS for Music Foundation (Oct 2015 - Oct 2016), GBP13,286. **G3:** F. Lyons, British Council (2016), GBP3,978. **G4** F. Lyons, *Commissioning Programme*, Arts Council of Northern Ireland (Feb – April 2020), GBP9,000.

#### 4. Details of the impact

##### (I1) Influence on creative practice of artists with and without disabilities:

Musicians with disabilities in the Acoustronic ensemble led by Lyons have testified that through working closely with his inclusive methods and technologies, they achieved higher levels of creative expression as composers and performers, gaining new independence as artists. One stated: **'my ability to express myself artistically and my confidence in leadership have been enhanced immeasurably'**. (C1) Another commented that: **'It's great to learn new things and express your emotions about music.'** (C9)

Lyons' Inclusive Creativity concept provided the working methods for the development of Europe's first inclusive youth orchestra, the Open Youth Orchestra of Ireland (OYOI) in 2019. Researchers from Lyons' Ulster team and musicians from Acoustronic led the year-long Le Chéile project which developed three new inclusive ensembles across Ireland that came together to form the OYOI. (C3, C6, C9)

The increased level of artistic accomplishment achieved by those musicians with disabilities who have worked with Lyons' technology-focused approaches has resulted in greater visibility at mainstream music events and in wider public understanding and acceptance of their creative output. This is evidenced by invited performances given by inclusive ensembles directed by Lyons, including Acoustronic and NonZeroSum in Derry, Dublin and London in 2017 and Lisbon in 2018. *NonZeroSum* was selected by the RNCM Chamber Music Festival to feature in a multi-site networked performance in March 2019. The Executive Director of the internationally renowned Walled City Music Festival said: **'The artistic excellence displayed in performances by these groups of challenging new work, including [...] 'NonZeroSum', drove my decision to programme a recurring Inclusive Creativity strand in the annual Walled City Music Festival, starting in 2015. More recently, the continuing artistic excellence and willingness to push boundaries displayed by the Acoustronic ensemble prompted me to apply for funding from Arts Council of Northern Ireland to support a commission for a new work from Professor Lyons for Acoustronic and the Ulster Orchestra. This application was successful and I will programme the new piece, entitled 'Zoom Time', in the 2021 Festival.'** (C4, G4)

The award-winning professional cellist of the Benyounes Quartet and NonZeroSum Ensemble said that working with Lyons' inclusive methods on the *NonZeroSum* project **'was a life-changing experience for me and my fellow musicians in the quartet in terms of how we value the extraordinary gift of being able to make music together, and also on a technical level as to how we interact with other musicians.'** (C5)

The findings generated by the investigations outlined in underpinning research have provided the thrust of numerous creative projects, residential artistic programmes, research symposia and training events focused on inclusive practice and accessible music technologies in the UK and Ireland (twenty events between 2014 and 2020), Sweden (five events between 2014 and 2019), the US (NYC 2017, 2018, 2019, Austin 2019) and Portugal (Setúbal 2016 and Lisbon 2018). In the course of this work Lyons has directly influenced many composers and performers with disabilities to more constructively utilise accessible technologies and enhance their creative practice. Over fifty Ulster University graduates who have taken Lyons' research-led modules in inclusive creativity and accessible technologies have gone on to pursue careers in the inclusive arts sector. Access tutors across the UK and Europe, including those working with Drake Music and Share Music Sweden have reassessed and revised their approach to working creatively with disabled musicians after attending training in accessible technologies delivered by Lyons. The strategies presented in this training form the basis of Drake Music approaches and format of Share Music Sweden courses and projects to the present day. The CEO of Share Music Sweden commented that: **'research findings arising from Professor Lyons and his research teams in Inclusive Creativity programmes since**

**2014 ... have fed into our development of best practice (in Share Music Sweden) artistic courses and have influenced how we've developed our own inclusive ensembles.'** (C7)  
 Over twenty non-disabled composers, from professional to student levels, have worked directly with Lyons in writing new works for the inclusive ensembles he leads, often using the technologies he and his team have developed. One composer states: **'I first came across the Inclusive Creativity research programme when I had a new piece workshopped by the NonZeroSum inclusive ensemble at the Walled City Music Festival in 2017. After engaging with the research findings of Professor Lyons as part of this workshop, I completely redirected my approach to composition using technology towards inclusive music-making, subsequently embarking on a PhD in 2019 on VR in inclusive music environments.'** (C6)

**(I2) Development of accessible future-focused creative technologies for use by artists:**  
 Dr Brendan McCloskey worked as part of Lyons' Ulster research team with members of the Wired Ensemble to develop the widely used InGrid accessible digital instrument, which was a finalist in the world's most prestigious competition of its type, the Margaret Guthman Prize at Georgia Institute of Technology, Atlanta, in 2014.

This strand of work has also seen collaborations between Ulster University, Walled City Music Trust (funded by Calouste Gulbenkian) and Drake Music in the design of a new accessible instrument, the Kellycaster, described by the disabled musician with whom it was developed as **'life-changing'**. The Kellycaster was unveiled at the Inclusive Creativity: Digital Practices Symposium in 2017 in Derry, UK, convened by Bridges with funding from Garfield Weston Trust and Walled City Music, which also featured community workshops in creating new accessible digital instruments. (C8)

Lyons has collaborated with composer and researcher Lewis Smith in his development of accessible apps used in a range of pieces by both composers including *NonZeroSum*, *Galvanised* and *Coruscation*. Lyons has pioneered the use of immersive technologies in working with musicians with disabilities and has mentored Smith in his use of VR in the composition and performance programme in the Le Chéile project and the development of OYOI (C6). Speaking on national news at the launch of OYOI led by musicians of Acoustronic, the Director of RIAM Connect commented: **'the beauty of this is, the technology gives us a platform for shared understanding; it unlocks voices for people that maybe couldn't access that voice with a regular instrument'**. (C9)

Lyons and Smith secured a Department for Economy (DfE) Scholarship (GBP61,832) in 2019 to pursue research into the use of immersive technologies, specifically VR and AR, to create composition and performance environments for inclusive music-making.

**(I3) Personal and professional development and enhanced artistic achievement of artists with disabilities:**

Musicians with disabilities in the Acoustronic inclusive ensemble led by Lyons have testified that through working closely with him they gained increased self-confidence and improved skills in the use of technology. In a specially commissioned film about the importance of Acoustronic in his life, one musician commented that **'music actually helps me to boost my confidence.'** (C2) These musicians have commented on how, after implementing in their creative practice techniques pioneered by Lyons, they felt empowered by the fact that their compositions and performances had attained more high-profile, mainstream opportunities for dissemination. They referred to improvement in their general levels of ability to use technology in their everyday lives driven by interaction with digital musical instruments in activities led by Lyons. (C1) Acoustronic musicians highlighted their heightened sense of independence and achievement gained in online music activities led by Lyons and his research team during the Covid crisis, where each musician participated from their home in virtual composition and performance sessions using their digital instruments. One stated: **'since the beginning of the Covid pandemic in March 2020, Professor Lyons and the research team have developed online tools for virtual rehearsals meaning that we have been able to continue to work on new music throughout the crisis, providing a real sense of independence and achievement in the face of adversity.'** (C1)

**(I4) Influence on strategy, curriculum innovation and professional training in the conservatoire sector:**

Acoustronic has recently been appointed as Ensemble-in-Residence at Ireland's national conservatoire, the Royal Irish Academy of Music (RIAM). This world first - an inclusive ensemble as ensemble-in-residence at a major national conservatoire - is part of the National Creativity Fund-supported Le Chéile Project, led by Lewis Smith and Denise White, members of Lyons' Ulster University research team which has established inclusive ensembles across the island of Ireland modelled on Acoustronic. **(C3, C6)**

The Director of RIAM and Vice-President of the Association of European Conservatoires has been influenced by Lyons' research to drive the integration of Inclusive Creativity principles and models throughout the conservatoire's training for staff, student performers and composers at all levels. **(C3)**

Drawing on Lyons' inclusive methods, Smith has delivered workshops on inclusive immersive environments and this formed a foundational platform for the inaugural performance by OYOI in September 2019 as part of the Le Chéile project. The *Conductology* gestural system developed by White under Lyons' supervision has been adopted as a core creative tool in the OYOI. **(C6, C9)**

Lyons and the Director of RIAM have delivered invited training events on inclusive creativity in 2019 to senior management, staff and students in Gothenburg Academy of Music and Drama, Stockholm University of the Arts and Maxim Tank University, Archangelsk, on inclusive arts practice in conservatoire curricula. **(C3)**

**(I5) Cultural and creative policy transformation:**

Lyons' profile in the field and the success of Inclusive Creativity have led to him being invited to contribute to public policy debates and decision making in significant ways. His research findings have directly influenced formulation of cultural and creative policy in Sweden, Ireland and the UK. **(C7, C10)**

As a member of the Advisory Board of Share Music Sweden, Lyons' presentations with the CEO to regional and national politicians have helped secure the status of National Knowledge Centre of Artistic Development and Inclusion for the organisation with an award of SEK7,000,000 (Sept 2017). **(C7)**

Launching the Le Chéile project in 2019 as part of the EUR1.25 million National Creativity Fund, the Irish Minister for Culture and the Director of RIAM acknowledged the direct influence of the research of Lyons' Ulster team as the foundation and building blocks of the inclusive approach driving the formation of the OYOI. **(C3)** The official launch featuring Acoustronic was covered on national news on RTÉ, in the Irish Times and Irish Independent, amongst others. **(C3, C9)**

Lyons has directly influenced allocation of public funding to commission inclusive creative output, most recently for *NonZeroSum* and *Zoom Time*. The Head of Music at Arts Council of Northern Ireland has stated of *NonZeroSum*, '**Advances in digital technology are changing the way in which music is accessed and created. This innovative piece by Frank Lyons means there are no barriers to high-quality music making for these musicians with disabilities. The Arts Council is proud to support the commissioning of this inclusive piece through the Beyond Borders programme and look forward to it touring this autumn.**' **(C10)**

**5. Sources to corroborate the impact**

- (C1)** Statement from a disabled musician and member of the Acoustronic Ensemble
- (C2)** Disabled musician and member of the Acoustronic Ensemble: Calouste Gulbenkian profile as part of Participatory Performing Arts/Sharing the Stage initiatives
- (C3)** Statement from the Director of the Royal Irish Academy of Music (RIAM) and Vice President of the Association Européenne des Conservatoires (AEC)
- (C4)** Statement from the Executive Director, Walled City Music
- (C5)** Statement from the Cellist in Benyounes Quartet and NonZeroSum Ensemble
- (C6)** Statement from a Composer and researcher
- (C7)** Statement from the CEO and Artistic Director, Share Music Sweden
- (C8)** Kellycaster article in *Disability Arts Online* magazine
- (C9)** Inclusive Creativity and the OYOI feature on RTÉ News, 24 September 2019
- (C10)** Arts Council of Northern Ireland, quoted in Belfast Telegraph profile of project