

Integrating innovation: Arts technologies for aiding recovery in rehabilitation

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Integrating innovation: Arts technologies for aiding recovery in rehabilitation

In a world where healthcare increasingly embraces innovation, arts technologies – such as digital musical instruments, virtual reality, and biofeedback systems – offer transformative opportunities for integration into music therapy and rehabilitation. These digital tools, when carefully applied, do more than simply support traditional therapeutic practices – they redefine the very ways in which music therapists connect with clients, opening doors to new forms of expression, growth, and recovery. This Special Issue of the *Nordic Journal of Music Therapy* invites readers into this transformative space, where technology and artistry converge to offer resilience and possibility in rehabilitation. We would like to express our heartfelt thanks to Dr. Grace Thompson and the editorial team for embracing the proposal for such a unique and unconventional Special Issue. 5 10

This Special Issue not only celebrates these innovations but also calls on all of us to continue pushing the boundaries of what is possible in the therapeutic use of music. The evolution of arts technologies has brought a revolution to the field of music therapy. If, as Clark (1997) suggests, technology can be seen as an extension of the mind, then the digital musical technologies described in this issue not only assist clients, but they become an integral part of their cognitive and therapeutic process. These tools, in fact, not only support physical abilities but expand the possibilities for interaction and creativity, demonstrating how technological innovations can extend both mind and body beyond their natural limits, opening up new interdisciplinary horizons in rehabilitation. By integrating tools such as “extended digital musical instruments”, which use body movement and gestures to control sounds, clients are offered the opportunity to express themselves creatively (Partesotti et al., 2018). Neurotechnological devices, on the other hand, use advanced sensors and virtual reality to facilitate motor recovery (Feitosa et al., 2022), where immersive technologies boost the experience of physical rehabilitation. Finally, “extended reality” technology, which includes virtual, mixed, and augmented reality tools, creates environments where users can interact with real and virtual elements that may enhance engagement and therapeutic outcomes. These tools can offer profound and multifaceted therapeutic experiences, supporting restorative and neurological changes. These technologies do more than enhance clients’ motor skills or support emotional regulation – they have the potential to ignite social connections and stimulate the brain’s capacity for neuroplasticity. It is through the use of these innovative tools that we see rehabilitation not only as a process of recovery but as an opportunity for clients to rediscover their full potential, both physically and emotionally. 15 20 25 30 35

This Special Issue of the *Nordic Journal* presents a collection of innovative contributions, each demonstrating the impact that technology can have on the therapeutic process and outcomes. These manuscripts together offer a clear and compelling 40

perspective on how music technologies are shaping current and future rehabilitation practices and research, providing clients with new opportunities for recovery and equipping music therapists with advanced tools to drive progress.

Hence, the articles in this issue guide us from clinical practice to research-driven innovation. We begin with articles that focus on practical applications in therapeutic settings, demonstrating how accessible technologies can directly impact client care. As the issue progresses, the focus shifts toward more experimental tools and concepts that push the boundaries of rehabilitation, particularly in terms of stimulating neuroplasticity and cognitive growth.

We begin with John Glaubitz's article, "*Using GlassOuse assistive technology to facilitate original music creation with GarageBand by a client with tetraplegia.*" (p. x). This manuscript presents a compelling case description where assistive technology enabled a client with tetraplegia to create music using widely available software. The article sets the stage for the issue by illustrating the significant therapeutic potential that these accessible digital tools can have in clinical settings. Next, the article by Rebecca Vaudreuil and her colleagues, "*The role of technology in music therapy, occupational Therapy, and co-treatment of an injured United States service member,*" (p. x) offers an insightful exploration of how digital tools can bridge gaps between interdisciplinary therapeutic approaches. By integrating music therapy and occupational therapy, supported by biofeedback technologies, this case example illustrates collaborative holistic care for complex conditions such as traumatic brain injury and post-traumatic stress.

Following are three original research papers. Camila Acosta Gonçalves and colleagues' article, "*Dedicated low-cost electronic ocarina for people with COPD: Rationale and prototype development,*" (p. x) introduces an innovative, low-cost ocarina prototype developed to aid in respiratory rehabilitation. The article underscores the importance of affordable technological solutions, especially in resource-limited settings, and emphasizes how such innovations can significantly enhance therapeutic interventions for individuals with chronic obstructive pulmonary disease (COPD). In "*Applications of technology innovations in music therapy practice*", (p. x) Alfredo Raglio expands the discussion by providing an overview of a series of studies that examine a variety of cutting-edge technologies being integrated into music therapy, such as sonification techniques. The article offers both theoretical insights and examples from research, demonstrating how these innovations have been used to improve therapeutic outcomes across diverse environments. Finally, "*Stimulating neuroplasticity: Therapeutic applications of an extended digital musical instrument,*" (p. x) by Elena Partesotti and colleagues provides an in-depth exploration of how extended digital musical instruments can be used to drive neurological change. By combining movement, audiovisual feedback, and advanced technology, the article offers empirical evidence of how these tools can stimulate neuroplasticity, and enhance clients' cognitive and motor functions. The final manuscript provides a forward-looking conclusion, reinforcing the idea that art technologies are not only tools for rehabilitation but also powerful drivers of neurological change.

The authors of the manuscripts presented in this Special Issue share a common thread: the belief that technology is not merely a tool used within music therapy, but that it can be an integral and transformative force capable of reshaping the landscape of rehabilitation. Whether through familiar, accessible tools or cutting-edge neurotechnological devices, these innovations provide

clients and music therapists alike with new possibilities for connecting and stimulating the motivation that rehabilitation demands. As clinicians and researchers in the profession, we witness how digital tools not only expand therapeutic possibilities through creative solutions but can also democratize access to high-quality care. By being user-friendly, customizable for diverse needs, and capable of reaching underserved or remote populations, they ensure equitable access to sophisticated therapeutic interventions. This accessibility, when placed central to the integration of arts technologies in rehabilitation, allows individuals from diverse backgrounds and resource-limited environments to benefit from interventions that were once available only to a select few.

As we look to the future, the integration of arts technologies in music therapy practice invites us to imagine what is possible when we combine human creativity with technological advancements. It is, therefore, our responsibility to observe and embrace these technologies thoughtfully and ethically, ensuring they are used in ways that prioritize client well-being, accessibility, and evidence-based practices while fostering interdisciplinary collaboration for the benefit of our field and our clients.

References

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