

Ludic Sonata

A Polyphonic Participatory Experience

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Abstract

Making music together is part of traditional rituals; it helps develop social bonds, build community, and improve mental health. Yet, in many societies, this fundamental part of human experience has been restricted to young children, with their innate sense of playfulness, and accomplished musicians. The workshop invites participants with any level of musical experience to rediscover the wonder of making music together. For this, they will engage in playful exploration of the sounds of everyday objects, digital sound transformations, and collective music-making activities inspired by Listening To Waves, a widely adopted program creating web applications and activities connecting music and STEM.

Keywords and Phrases: Sound, Music, Playfulness, Collective

1. WORKSHOP DESCRIPTION

1.1 SCOPE, MOTIVATION, AND BACKGROUND

The workshop will introduce methods and tools to provide a low floor for making music together. In the first stage, participants will explore how everyday objects can make surprising sounds, and how to use Listening to Waves web applications to transform sound. In the second stage, they will use the sounds they created to collectively create polyphonic rhythms inspired by Afro-Latin and Indian percussive traditions. In the third stage, they will use the sounds and the rhythms to construct a musical piece structured as a Sonata. Finally, the participants will reflect on their experiences and discuss ways to synthesize individual expression and collective creation.

This workshop is inspired by the activities of Listening to Waves, a program sponsored by the US National Science Foundation seeking to engage children in STEM through the connections with music. The program creates playful web applications and hands-on collaborative activities and has been shown to engage children in their science classes (Booker and Minces, 2022; Minces et al., 2021; Song et al., 2023). The curriculum and resources created by the program are being adopted worldwide, and the program has trained hundreds of teachers, directly reaching tens of thousands of students annually and increasing their interest in STEM and enjoyment of school (Figure 1). The workshop design inherits Listening to Waves' spirit of exploration



and playfulness around sound, and adds the musical percussive scaffolding techniques found in the Afro-Latin and Indian musical traditions. The participants will contribute their ideas through active music creation in a group collaboration, reinforcing a sense of shared ownership and collective creativity. The workshop creates a space where ideas from different fields and cultures can merge into a shared musical language.



Figure 1: Children and teachers using Listening to Waves' web applications and activities for exploring and creating sound.

The emphasis on providing a low floor to creation and a scaffold to reach a high ceiling is key to constructionism (Resnick, 2017). The proposed sound exploration and collaborative music creation workshop is relevant to the CS/Maker education community because it aligns with the constructionist learning principles, where learners actively engage in constructing knowledge through experimentation and play. The workshop engages the participants in exploring the acoustics of physical and digital objects in tangible ways, providing an accessible entry point for diverse learners in the STEAM and digital creation contexts. By leveraging sound as a democratic medium for interaction, this workshop breaks down barriers, stimulates new ways of thinking, and celebrates the power of collaboration, hence the workshop fits this year's theme of 'Building Communities, Bridging Ideas'. The workshop's activities will model how, through proper scaffolding, individual artistic expressions can be woven into a coherent collective art piece. This workshop will engage the constructionism community in a dialogue on collective artistic creation, providing a tangible experience to situate the conversation in the context of sound and music. These activities and reflections can inspire the constructionism community in developing new ways of collective creation.

References

- Booker, A. N., & Minces, V. (2022). Harmonized mutual development through exploring and creating sound. *Proceedings of the 16th International Conference of the Learning Sciences-ICLS 2022*, Pp. 871-878.
- Minces, V., Khalil, A., & Booker, A. (2021). Listening to Waves: Engaging Underrepresented Students Through the Science of Sound and Music. *Connected Science Learning*, 3(4).
- Resnick, M. (2017). *Lifelong kindergarten: Cultivating creativity through projects, passion, peers, and play*. MIT press.
- Song, Y., Xing, W., Barron, A., Oh, H., Li, C., & Minces, V. (2023). M-flow: A Flow-based Music Creation Platform Improves Underrepresented Children's Attitudes toward Computer Programming. *Proceedings of the 22nd Annual ACM Interaction Design and Children Conference*, 233–238. <https://doi.org/10.1145/3585088.3589383>