

Audio Engineering for Podcasts by deaf and Hard of Hearing Creators Keita Ohshiro¹; Mark Cartwright²



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1. Introduction

Podcasting has become a significant medium, contributing to diverse areas such as news, education, and community empowerment. Advances in technology have made podcast creation—especially audio engineering—easier and more accessible to a wide range of people, including amateurs.



P2 adjusts the position of the waveform above without listening, recognizing the



P1 knows that a tiny

Yet, research on the accessibility of podcast creation and audio engineering by people with disabilities remains limited. Given the inherently auditory nature, studying how deaf and hard of hearing (dHH) individuals engage in podcasting and audio engineering is particularly important.

This study aims to understand how dHH individuals navigate podcast audio engineering, building on our previous study on music production by dHH audio engineers [1].

2. Background Information

Podcast Accessibility and Creation

Research on podcast accessibility has primarily focused on helping dHH audiences engage with content through transcripts and tools to support accessible podcast creation. However, the act of podcast creation by dHH individuals themselves remains largely overlooked.

Audio Engineering for Music and Podcasting

word '*um*' just by its shape.

up-and-down pattern is background noise.

Learning as Self-Taught dHH Audio Engineers

Inaccessible learning materials, such as videos without captions, limited how participants could learn. They often relied on trial and error, leading to uncertainty about whether they were doing things correctly.

This self-teaching approach resulted in unique methods that often deviated from standard practices and made it harder to adopt new, potentially more effective tools and workflows.

Leveraging Peer Support

All participants emphasized the value of peer feedback to ensure quality, resolve uncertainties, and improve their skills. For example, P3 shared how peers introduced new concepts:

"[My friends said,] 'You describe this thing happening

In music, the focus is on sound elements, such as mixing instruments and vocals to shape the overall sound. In podcasting, the emphasis is on storytelling through speech and sound, such as adding appropriate sound effects to enhance a scene.

3. Method: Online Interview

We conducted one-hour online interviews with four dHH podcasters to understand how they navigate audio engineering. All participants were self-taught and began podcasting between 2017 and 2019.

Participant Demographics

| ID | Identity | Self-Described Hearing | Hearing Device Use |
|----|----------|-------------------------------------|--------------------|
| P1 | НоН | 65% hearing in left, worse in right | None |
| P2 | deaf | Moderate hearing loss | Hearing Amplifier |
| P3 | deaf | Moderate hearing loss | Hearing Aid |
| P4 | deaf | About 25 to 30% of normal hearing | Hearing Aid |

here and you don't have any kind of sound for it.' and I'm like, 'That makes a sound?'"

They also emphasized the importance of becoming more comfortable asking for help, while being mindful not to over-rely on peers for support.

5. Discussion: Potential of Al Tools

Of the many insights we discuss (see our paper!), one highlight is the potential of AI tools in sound design.



Consider the task of inserting a walking sound. Multiple factors must be taken into account, such as the materials of the shoes and flooring, walking pace (e.g., fast or slow), and surface conditions (e.g., snowy, rainy, or muddy). Sourcing and selecting the right sound for a scene is no easy task.

4. Findings

Use of Visual Editing Techniques

Visual editing helped participants perceive sound and perform audio engineering tasks while reducing hearing fatigue. Yet, this approach had limitations, as not all sounds could be visually identified. For example, P2 described challenges in sound design tasks, saying:

"Little things like setting dishes on a table, that kind of a quiet subtle sound, but it needs to be just right. That part is so hard to do." **Generative AI Tools** offer a promising direction by allowing users to generate custom sounds through text prompts and modify them as needed.

Audio Captioning Tools could also help dHH audio engineers better perceive and interpret sounds by describing subtle audio details.

Future research could explore how to design and evaluate these tools with dHH podcasters, tailoring them to their specific needs to enhance accessibility and streamline the sound design process.

1. Keita Ohshiro and Mark Cartwright. 2024. Audio Engineering by People Who Are deaf and Hard of Hearing: Balancing Confidence and Limitations.