

A Phenomenological Inquiry of Sound Within Educational Games

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Abstract: In what ways does sound affect our experiences of play within software-based educational games? This study takes a phenomenological approach to examine participant as they played games with and without sound. Three hundred and seventy eight horizons were coded across six interviews, and a rigorous phenomenological methodology was used to distill the horizons to the essences of subjective participant experiences with sound in games. These results reinforce findings from the extant literature on game sound in which sound reinforces critical aspects of game-play. Sound provided a sense of presence in the game environment, by offering participants an entrance into a coherent, immersive experience of gameplay. Sound and visuals cohered to create a unified perceptual experience that resulted in emotional connections with the plight of in-game characters, while the lack of sound left players wanting to learn more about characters they were trying to save.

Literature Review

This study explored a line of inquiry into the ways that sound affects our experiences of educational game-play. Research that is directly related to this question is rare. In 2008, Susan Bishop analyzed the relationship between uses of sound and the types of knowledge processing they supported across four educational game titles. Bishop's study helps us to understand that sound can be designed to support specific tasks while interacting with software (Bishop, 2008). However, the results from such analyses are unable to help explain the reasons *why* uses of sound might have such effects. Without such insight, it is difficult to design sound in ways that positively support learner experiences in educational games. Research that examines sound in educational software other than games does exist but focuses predominantly on questions of cognitive load (Sweller, 1988; Baddeley, 1992; Paivio, 1990). These questions can help us understand how much content to present through narration or on-screen text, but are inadequate in helping us to understand how auditory and visual information can work together to create engaging educational software. In contrast, game audio research offers further insight into the use of sound. Commercial game titles use sound in the form of sound effects and music to design game environments and support game mechanics (Collins, 2008). Music in games is carefully paired with visuals, and helps to provide emotional cues, foreshadow events, and sets the emotional tone of game environments (Whalen, 2004). Game sound effects are also critical in communicating information (Jorgensen, 2008). In her study, Jorgensen examined how people react when sound is taken away mid-way through game-play. When interviewed, participants described feeling a loss of control such that they felt "in the dark", and in one instance referred to the experience as "losing a leg" (Jorgensen, 2008, p. 166). Such descriptions of participant experiences are compelling, and thus form the basis for this inquiry.

Methodology

I chose phenomenology as the methodology for this study because of its ability to bring participant experiences to light. Phenomenology, according to Giorgi, is the study of the "totality of lived experiences that belong to a single person" (Giorgi, 1997 p. 2). To search for perspectives from experience is to search for the *essence* of a phenomenon; the "articulation, based on intuition, of a fundamental meaning without which a phenomenon could not present itself as is" (Giorgi, 1997 p 6). The process we take to engage in such a search necessarily involves a search for "all ideally possible perceptions" (Husserl in Moustakas, 1994 p 53). This application of phenomenology begins with a process to find "angles of looking" at a phenomenon (*horizontalizing*), then reducing this initial set of perceptions into salient themes (*invariant constituents*) that through further analysis are described as the essence of a phenomenon (Moustakas, 1994 p 53). In this study I asked, *what are the essences of player experiences of sound in educational games?* I took a phenomenological approach to search for the essence of three perspectives of sound in educational games and explored the phenomenal meanings that emerged from their experiences of game play. I asked everyone to select and play two educational games across two 45-90 minute interview sessions. Participants first played each game with the sound turned off, then again with the sound turned on. I adopted a lightly structured, walk-through interview approach and I engaged people in a dialogue about their experiences with sound. The games that people chose to play included *Hush*, *Peacemaker* and *Alien Rescue*.

Data Reduction

I initially coded 378 references from transcribed interview data; each reference representing a unique horizon of participant experience. I eliminated 98 horizons based on relevance and further reduced the remainder into 12 overall themes to represent the final set of invariant constituents. These constituents ranged from the use of game music to support effective engagement to the use of game sound to provide immersion and impact and to help players to identify as in-game characters.

Essences of Participant Experiences with Sound

In this study, Thomas, Karen, and Anne shared their experiences of playing educational games with sound. For these people, sound allowed them to collectively pass through a gateway into the worlds presented to them to explore and interact within. The ability to hear the game, not just play it, enabled them to be fully *present* during play. They virtually entered and momentarily existed in the game space, connected with the embedded stories, identified with the plight of characters in the game, and in the case of Anne, felt the emotional contours left by the game after she left the first interview. They expected that the sounds they heard and visuals they saw would work together, and pointed out the times when they didn't. There were also times when sound wasn't present when they expected it to be. Karen thought the lack of sound in the space station in *Alien Rescue* made the station sound "...creepy". For Thomas, playing *Hush* with sound allowed him to gain entrance into the world presented, "I never thought of it like that before. You always hear about these war-torn countries...but it's like, 'Wow'...Much deeper than I thought it was going to be. Definitely went from a typing game to a, 'Oh wow!' This is a serious social issue." For Anne, her experience playing *Hush* with sound enabled her to connect with her own life experiences, "...I think that the first time I played it [without sound], I was intellectually there...But then when you go in [with sound] you can't help but understand it in a... much more experiential way that sort of touched not just my head but my heart, too."

Imaginative Variation and Implication

The visual and auditory gestalt of gameplay compels us to hear as well as to see. Sound marks our interactions, and signifies our choices. What we hear wraps us within worlds unknown. It enlivens game stories, bringing us closer to game characters, and encourages us to save the world.

Limitations

The results from this phenomenological approach used are not generalizable past these participants. Moreover, participant experiences could have benefited from deeper analysis of overlapping meaning units and greater attention could have been paid to participant experiences of gameplay and music.

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