

Playing Well With Others: An Ethnographic Examination of a Cross-Disciplinary Science-Theatre Collaboration

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Abstract: This piece describes a participatory ethnographic study of a cross-disciplinary collaboration between science education researchers and theatre educators creating a science-based play for middle-school youth that aims to dismantle stereotypes about participating in science and becoming a scientist. The ethnography aimed to identify factors that contribute to successful cross-disciplinary collaborations and to understand why interdisciplinary collaboration is essential to designing learning environments that engage students unengaged with or intimidated by typical schooling contexts.

Purpose

Informal learning environments are important and influential spaces that can foster positive attitudes towards science (Bell et al., 2009). In these environments, science can, for instance, be approached through narrative and storytelling, affect, and drama (Owen, 2014). Learning environments that fuse science education with theatre provide a unique and essential learning context for students intimidated by or otherwise disengaged with science in typical schooling environments. These cross-disciplinary designs enable students to reimagine what it means for them to participate in and enjoy science (Long, 2014) and empower students to establish personal connections between the scientific material and their own lives (Ødegaard, 2003).

Despite the benefits of designing learning environments that combine theatre with science education, significant barriers exist to creating and accessing these learning environments in the United States, particularly in public schools. For instance, in the U.S. only 28% percent of secondary public schools with high concentrations of poverty offer theatre-education classes (Parsad & Spiegelman, 2012).

From a design perspective, cross-disciplinary collaboration — particularly communication and establishing expectations — can be especially challenging between scientists and theatre artists, since these two communities generally have vastly different metrics for defining and evaluating “good” work (Friedman, 2013). Despite these challenges, researchers must understand how to foster cross-disciplinary collaborations in order to create new learning environments that benefit more students.

This piece describes a participatory ethnographic study of a cross-disciplinary collaboration between science education faculty and graduate researchers at a research institution, and theatre educators and playwrights from a professional children’s theatre in the Northeast United States. The study examines the collaborative efforts of the science- and theatre-education teams throughout the preparation for and execution of the team’s first intervention: an original play for middle-school-aged youth aiming to dismantle stereotypes about what it means to “do science,” and who can pursue a career as a scientist. The study aimed to (1) examine and identify factors that shaped the collaborative efforts between the two disciplinary teams; (2) understand how their collaborative efforts influenced the creation and implementation of the intervention; and (3) determine implications for designing interdisciplinary science-based learning environments.

Conceptual and analytical frameworks

The conceptual framework was grounded in *collaborative creativity*, a shared creation or discovery made by two or more individuals incapable of making that discovery on their own (Hargrove, 1998). The data analysis was informed by *activity theory*, a psychological and multidisciplinary theory with a naturalistic emphasis that offers a framework for describing activity and provides a set of perspectives on practice that interlink individual and social levels (Engeström, 1999). Here, the author was interested in understanding how the collaboration between members of the science and theatre teams impacted the nature, structure, and form of the play. Using activity theory, the author discerned how power and leadership was distributed through the actions, activities, and goals of participants throughout the creation and implementation of the play.

Inquiries and data sources

Data consisted of the ethnographer’s notes from group meetings and three semi-structured interviews with participants ($N=7$) — the two principal investigators (one a science education faculty member, one the producing artistic director at the partnering children’s theatre), another science education faculty member, a seismologist, the playwright, and three graduate student researchers. The author conducted these interviews at the beginning, middle, and end of the play’s development and implementation, which spanned 14 months, from

August 2016 to October 2017. The interview questions encouraged participants to reflect on the cross-disciplinary collaborative process; the creation, application, and effectiveness of the intervention; and the evolution of participants' thoughts about working with individuals from different disciplines. These questions aimed to capture a holistic view of the collaborative process. The participatory nature of the study emerged when the ethnographer, also the lead graduate student on the project, implemented participants' ideas after each interview.

Results

Preliminary analysis using a grounded theory approach — specifically, Initial Coding and In Vivo Coding (Saldaña, 2015) — identified three factors as crucial for a successful cross-disciplinary collaboration: (1) frequent and clear communication, (2) firm establishment of common goals at the beginning of the process, and (3) a willingness to “hear all voices.” In fact, it was this openness of the team that appeared to mediate the science/story tension that drove much of the structure, nature, and design of the learning environment. Two participants explicitly acknowledged the importance of having a liaison (the ethnographer, in this case) who was comfortable working within both science and theatre education domains and who communicated regularly with both teams. Although five participants explicitly mentioned the benefits of having frequent face-to-face meetings, another suggested that frequent meetings are tedious and labor-intensive, preferable only in theory. Figure 1 captures how these elements interact during the collaborative process and illuminates whether these elements should be acted upon in person or remotely.

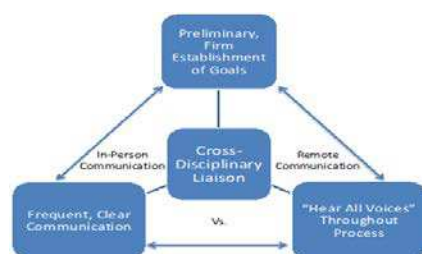


Figure 1: The interaction of preliminary findings from this study.

Significance

This work can provide guidance for future cross-disciplinary education collaborators seeking to examine and implement necessary elements for successful cross-disciplinary collaborations, particularly in reference to an intermediary who understands the working and communication styles of both or all disciplines. It also demands that future researchers further examine the roles that personality, identity, and disciplinary culture play in cross-disciplinary collaborations, and to understand how these factors can inhibit or further the design and implementation of learning environments for students.

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