Design discourse: Interactions of an interdisciplinary research team and what it means for design-based research

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Abstract:

Design-based research (DBR) methodology emphasizes the design and implementation of educational artifacts that researchers create in real-world contexts with interdisciplinary teams (Wang & Hannafin, 2005). DBR is centered around an iterative design process to create technology with the users rather than for users (Ormel, Roblin, McKenny, Voogt, & Pieters, 2012). While DBR prioritizes design, researchers in this area typically report the final designed form of technology rather than the process conducted when designing. This has created a gap in the literature, forcing readers to make assumptions about *how* technology was designed and *by whom* (Edelson, 2002).

When an interdisciplinary team is designing a piece of technology, the process and methods used in its creation are particularly relevant to address this gap and document *who* designed the tool and *how*. A final design shows no indication of the complex collaborations, communication of project goals, or prioritization of the components that were determined during its creation. As DBR becomes a widely used methodology in the Learning Sciences, research is needed to understand how this methodology is applied in practice. The present study responds to calls from the field, for researchers to disseminate the design processes to conduct DBR studies (Edelson, 2002; Kolodner, 2016; Phillips, 2006; Sandoval, 2014). Innovative learning takes place during the process of designing educational technology, and researchers are not documenting or assessing this to the same extent as other forms of learning (Kali, 2016). Without this discourse, there is no way to judge the quality of the design process, and researchers may be replicating mistakes that others have already addressed. In this study, I investigated how an interdisciplinary team designed a collaborative orchestration tool and analyzed the interactions that took place among this group. The study broadens our understanding of how DBR processes are enacted to explore this form of learning among researchers and improve how we apply this methodology in practice.

This qualitative study explores interactions within a design brainstorm meeting of eight team members from four disciplines. This analysis reports on the emergent design discourse and discusses the interplay between collaboration, connectedness of conversations, and critical moves to understand how ideas were generated. Findings from this identify interactions that lead to high quality discussions and I report outcomes from this process that lead to the final design of the orchestration tool. The results of this study suggest that the interdisciplinary team achieved the highest quality collaboration and ideas during intersected, convergent discussions that were identified using a traditional design method called linkography (Goldschmidt, 1994). Using a sociocultural framing, the study describes pattern of interactions and how those patterns lead to different kinds of ideas. By analyzing this design process, I was able to identify gaps in our team's design process, solutions that were not enacted, and collaborative scaffolds that may

improve our process in the future. From these findings, I present suggestions for others engaging with DBR methodology to support productive collaborative interactions.

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