Game Making and Designerly Thinking

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Abstract: In this poster, we present issues and questions associated with the use of game making to cultivate designerly thinking among learners who are not in professional design contexts. We describe our use of design games to reduce the complexity of open-ended game design while encouraging deeper engagement with design processes. We invite discussion of preliminary data that illustrate strengths, limitations, and future directions for the use of design games in scholarship and practice.

Purpose and significance

The purpose of this poster is to invite discussion of *design games* as a way to leverage the value of games and game making for engaging learners in designerly thinking. In this work, we hope to contribute to scholarship on the use of game making for learning, as well as to debates over the nature and process of "learning to think like a designer." While much research has focused on the educational value of playing games, there has been less investigation of learning through game making. The value of game design for enhancing designerly thinking in particular has received scant attention.

Promoting learners' abilities to "think like designers" has become an explicit or implicit goal of many efforts to enhance K-16 education through constructionist learning activities. Scholarship on professional designers' practice stresses the nature of design as a complex, flexible, situated, and social process. Expert designers quickly assess the constraints of a particular design problem and context, shift rapidly among different forms of thinking, and focus on generating solutions (Dorst & Cross, 2001). The challenge lies in translating the complex processes of real-world design for learners not aspiring to be professional designers. The Stanford d.school's (2018) five part model of design thinking has been widely used to introduce educators and students to strategies and mindsets presumed to be widely applicable across design problems and settings. This model has drawn criticism for misrepresenting the design process as linear, reducing it to a "toolkit," and ignoring context. In our work, we seek to immerse learners in a design experience that emphasizes deeper engagement with the kind of "opportunity-driven problem-solving" (Conklin, 2005, p. 4) characteristic of real-world design practice.

Design games: Rationale and key elements

We are developing and refining our conception of design games through a design-based research approach that involves an iterative process of innovating and testing educational interventions while addressing theoretical questions about the nature of learning (Design-Based Research Collective, 2003). In an initial research stage, our goal was to investigate the process and outcomes of engaging learners in designing games around social issues, using an explicit design thinking framework. We guided adolescents through the Stanford d.school (2018) phases of design thinking (empathize, define, ideate, prototype, and test) as they collaboratively created board games around social issues, such as water pollution. Though we hoped the explicit and sequential nature of the model would scaffold deeper engagement with design, it prompted facilitators--and therefore participants--to focus on isolated tasks and stages. Participants became bogged down by tasks that in their eyes had little to do with designing their game. They also spent considerable time producing prototype materials, reducing more meaningful engagement with designing or with the social issue. While participants created simple and sometimes intriguing games, they were typically incomplete. As the workshop drew to a close, participants were most interested in working on their own games and did not take full advantage of playtesting their own or other teams' games.

The inspiration for design games arose during our analysis of participant-created board games from these workshops. As we play tested the games to better understand their features, we spontaneously engaged in "designerly discourse" similar to what we hoped to provoke among participants; additionally, the activity was enjoyable and required much less time than the larger workshops. We created the new design game activity to constrain the complexity of the game design process and avoid a prescribed series of design stages.

The term "design game" in the field of design education originally referred to playful ways of engaging professional designers in reflection on design processes (Habraken & Gross, 1987). We adapted the approach to introduce novice participants from various backgrounds to general forms of designerly thinking. In our work, we have adopted the term "designerly thinking" following Johansson-Sköldberg, Woodilla, and Çetinkaya's (2013) use of this term to characterize the more complex views of design that contrast with simplified models of design

thinking. We assume that successfully engaging in design practices requires fluency with particular cognitive and behavioral processes though these are likely to be recursive and interwoven throughout the design experience.

Our design games share three characteristics with design games more broadly, including collaborative design, interplay between real and imagined designs, and tangible game materials (Vaajakallio, 2012). Our design games have a "game-within-a-game" structure. At the core of the design game is an incomplete board game with associated materials (i.e., game objective and rules, dice, etc.) but inadequate rules or game mechanics. The objective of the design game is to "fix" the board game so it is playable. Participants adopt the role of player/designers; they all must play the board game, encouraging collective participation in identifying elements that require modification. Participants are given optional materials, such as blank cards and tokens, with which to modify the game. An important educational component is post-game reflection. In our current approach, we ask participants to describe their design process and discuss how their thinking reflects the d.school design thinking model. Figure 1 provides images of three incomplete board games.

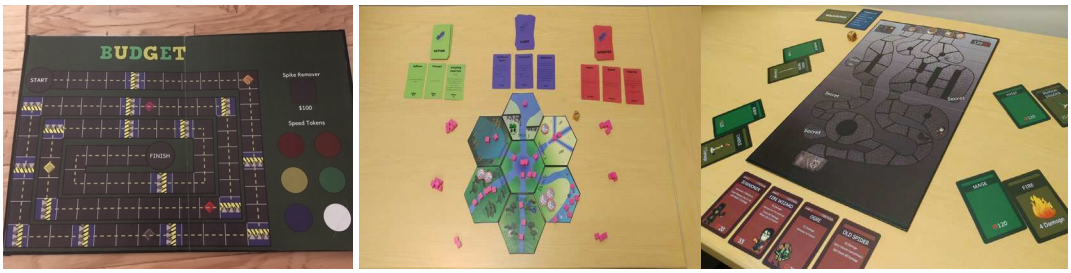

Figure 1. Incomplete board games.

Questions and issues

We have been collecting data from design game sessions with participants from varied backgrounds. Through ongoing analyses of these data, we have identified multiple forms of designerly thinking in transcripts of group conversations from these sessions. In addition, the design game's combination of play and (re)design seems to facilitate participants' expression of their intuitive understanding of games as systems. We also have evidence of participants' engagement with social issues represented in the games. However, questions remain about how to most productively leverage the design game experience for participants' learning. For example, we believe that design games can be valuable as preparation for more formal and extensive learning about design processes and strategies, but we have yet to identify next steps. It also seems likely that board games that are more or less "broken" or that have different levels of complexity will offer different opportunities for learning. Comparing participant engagement in design with such different games is another potential direction for further work. Lastly, one of our broader goals for involving students in design processes is ultimately to enhance their ability and desire to creatively address personal, community and societal problems. While design games do not engage participants in designing actual solutions to such problems, we hope that the experience can be a step towards that goal. Building connections between designing games and designing a better world is an ambitious but perhaps crucial next step.

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