

The Cube Game – An Online Exercise for Multidisciplinary Collaborative Design

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Abstract

Architectural products require the collective efforts of many professionals and non-professionals, such as architects, structural, mechanical, and electrical engineers, construction managers, financial advisors, legal experts, lighting consultants, acoustical experts, to name just a few. Thus, the multidisciplinary aspect of collaboration is a vital aspect of the architect's education. However, common practice in architectural education has been focused on form-making skills, which is not amenable to the nature of multidisciplinary collaborative design. Being a process, rather than a product, it cannot be revealed by judging the results alone, which is often how form-making skills are taught and judged. Rather, the process of collaboration is only evident when the number of the participants exceeds a certain threshold, and when actions taken by other participants affect an individual's on-going design decisions. The advent of online, multi-player games provides an analogy and an opportunity to explore interactive collaborative design pedagogies. Their abstract nature helps focus attention on the core issues of the simulated phenomenon, while the playful nature of a game, as opposed to 'work,' encourages immersion and role playing that contribute to the learning process.

The Cube Game was originally developed to help architecture students understand the joint decision-making process of collaborative design, by providing positive reasons to collaborate (e.g., to achieve more than can be done alone). The game is modeled after popular board games like Scrabble and Monopoly, though without turns (players do not have to wait for others to complete their transaction to make their move). It allows users to play different roles (each with its own set of goals), while collaborating to achieve the game's overall, common objectives. The vehicle we chose for implementing these objectives was the design of single family house made of colored cubes on a site shared with other students who build their own houses. Each cube represents a different type of room, has different size (e.g., small, medium, large), and has a certain point value (different types of rooms have different point values). Each house is the result of collaboration among a client, an architect, and a builder (or a contractor). The game was structured in a manner that requires the three students to work with one another towards accomplishing the collective goal of making a house. Adjacency rules control the allowable placement of cubes (which cubes must be adjacent to other cubes, and which cubes must not touch one another), which are established by the client. Additionally, a complete house, much like an acceptable word in Scrabble, must include a certain number of cubes of certain types (the equivalent of having a bathroom, a kitchen, a bedroom, etc.). The value of a house depends on the number and types of rooms it is made of (i.e., a small house may have only a kitchen, one bedroom and one bathroom, whereas a large house may have a kitchen, five bedrooms and three bathrooms), and on the values of the neighboring houses. The game was structured in a manner that requires the three students to work with one another towards accomplishing the collective goal of making a house. Now in its third version, the Cube Game promotes the notion that each participant has a different kind of knowledge, and has a different view of the world (i.e., different user interface for each role), thus requires a different representation of the shared enterprise. The Cube Game exercise is intended to reflect the fragmentation of the AEC industry, and to teach the students how to cope with problems in design collaboration.

This paper describes an on-line game for simulating the design collaboration process. It espouses to simulate, exercise, and provide a feel for the social dimension of collaboration, by embedding mutual dependencies that encourage players to engage each other—in adversarial or collaborative manner—to accomplish their goals. Specifically, it is intended to help students understand what is collaboration, why it is necessary, and how it is done.