

## **Playing for Public Interest: Epistemic Games as Civic Engagement Activities**

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There is a growing body of research examining how educational computer games can promote civic engagement [4]. Epistemic games [5] are computer games that simulate professional training experiences. This study examines one epistemic game, Urban Science, in which youth role-play as urban planners [5, 6]. In the game, as in the actual profession, urban planning work is guided by the value of serving the public interest [5, 6]. This study examines whether players of Urban Science learned about the value of serving the public interest. While the presented results are preliminary, they suggest that epistemic games like Urban Science might be useful activities for promoting youth civic engagement.

### **Introduction**

While it is believed that youth in the USA are less engaged in civic affairs than earlier generations [1], researchers today suggest that youth are involved in their communities [2], and that participating in communities is the way that youth develop into healthy adults [3]. One way to shepherd youth into the life of their communities is training them to think like civic-minded professionals.

There is a growing body of research examining the power of educational computer games to promote civic engagement [4]. Epistemic games [5] are a type of computer game designed to simulate professional training experiences that have the potential to promote civic participation.

This study looks at one epistemic game, called *Urban Science*, in which youth play the role of professional urban planners [5, 6]. In the game, as in the actual profession, urban planning work is guided by the value of serving the public interest [5, 6] This study examines whether players of Urban Science learn about the value of serving the public interest. While the results of this study are preliminary, they suggest that epistemic games like Urban Science, in which youth learn to think like professionals in explicitly civic professions, might be useful activities for promoting youth civic engagement.

### **1. Theory**

Researchers argue that youth are especially engaged when their activity is connected to their community [2]. For example, studies have shown that participating in civics courses in which students discuss current events in their communities or engage in service-learning projects improves civic commitments among youth [7, 8]. Researchers have also argued that effective preparation for citizenship should entail not only civics instruction, but preparation for self-sustaining work [9]. Positive work experiences have been theorized to have developmental benefits for youth [10]. For example, research has

shown that internships that provide students with opportunities to do the work of a profession (beyond clerical work) help them have a better understanding about the relevant steps necessary to achieve their vocational goals [11]. Others suggest that learning through occupational training is a potentially empowering and equalizing pedagogy [12-14].

Shaffer suggests that computers make socially-valuable occupations more accessible to students by simulating environments and processes that occur in the real world on the screen [5]. Computer games in particular are ideal for allowing youth to participate in activities that would otherwise be logistically or developmentally inaccessible. The affordances of computer games can extend to civic learning. As a recent MacArthur report argues, many youth have gaming experiences that parallel aspects of civic life, including helping others, thinking about moral and ethical dilemmas, learning about societal problems, and making decisions about how a community should be run [4]. Encouraged by these characteristics, researchers and practitioners have called for games designed specifically with civic lessons in mind [15]. Sometimes called “serious games,” these games have a pedagogical purpose beyond simply mastering the game and having fun: the civic benefits of these games are intended, not incidental. One type of educational video game—modeled specifically on socially-valued professions—is the epistemic game.

Epistemic games were developed to address what Shaffer points out as a flaw in schools: schools focus on basic knowledge and skills that are perhaps easy to assess, but actually have little application in the real and adult world of today and the future [5]. As simulations of professional practica, epistemic games are designed to prepare young people to think as innovative professionals. Epistemic games have been modeled on socially-valued professions such as conflict-resolution, engineering, science journalism, and urban planning [5]. Each game requires players to learn to participate in a professional community that has its own set of norms and discourse. By explicitly being about adult affairs and decision making and requiring adult actions, epistemic games attempt to model how adults work and think [5, 16], and they do it in such a way that require youth to grapple with community problems.

Urban Science is an epistemic game in which players work as interns at a fictional urban planning firm [5, 6]. Urban planning is an explicitly civic profession, in which planners are asked to: help communities develop their own vision of the future; prepare plans in response to shared community objectives; analyze qualitative and quantitative information to suggest solutions to complex problems; and present recommendations to public officials and citizen groups [17]. In other words, in addition to having domain-specific knowledge and employing various skills, planners’ actions are guided by a civic purpose of serving the public interest [18].

This study looks at Urban Science as a tool for introducing youth to the urban planning profession’s dedication to the civic value of serving the public interest. Specifically, we ask if players talk more about the value of serving the public interest after playing Urban Science.

## **2. Methods**

## *2.1 Participants and setting*

21 high school aged players recruited by outreach specialists at the Massachusetts Audubon Society's Drumlin Farm Wildlife Sanctuary played a 10-hour version of Urban Science as part of a week-long Conservation Leadership Program in August 2010. Players had no prior experience with urban planning.

The two mentors in the game, who guided the players as they worked and led team meetings throughout the process, were played by a graduate student and a Drumlin Farm education specialist. Both mentors underwent a one-day training that covered the urban planning profession, the game's activities, and preferred mentoring strategies.

## *2.2 Game activities*

Urban Science was designed to simulate an urban planning practicum experience. When the players sign into an office intranet portal, they begin to receive emails from a non-player-character (NPC) supervisor who is controlled by their mentor. These emails provide instructions throughout the game.

In the game, players produce land-use plans for their local community. To make these plans, players conduct research during a "virtual site visit," in which they learn about a group of stakeholders' goals for the site. They conduct preference surveys, in which they work with their colleagues to learn more specifically what their stakeholder group wants. To create these surveys, they use a geographical information system (GIS) software program called iPlan that allows them to see how land use changes might impact the social and environmental issues that the stakeholders care about. These issues include things like traffic rates, number of jobs and sales, available housing options, and pollution levels. Their stakeholder group provides feedback on the players' surveys, which allows the players to triangulate just how much change to the site will please their stakeholder group. Finally, players create a final land use proposal that attempts to meet the needs of both the stakeholders they researched and the groups of stakeholders that other teams of players studied. In the final proposal, they create a model a proposed redeveloped site using iPlan and write a final report in which they describe and justify their recommendations, as well as the limitations and compromises they needed to make. Throughout the game, mentors are available to help the players if they struggle and to guide players' reflection on their work.

## *2.3 Data collection and analysis*

As part of the game, players took an online pre interview and an online post interview. The interviews included five short-answer pair questions about urban planning:

- Why do people plan cities?
- How do you decide when a city is well planned or not?
- What information do urban planners use?
- What are the parts of a good urban plan?
- How do you decide whether an urban plan is good?

The players' answers to the questions in the pre and post interviews were coded for references to the value of serving the public interest. If a player's answer to the question included discourse about seeing one's job and/or responsibility as representing the concerns of others, then that answer was coded as a 1 for "value of serving the public

interest.” Answers without such discourse were coded with a 0. For example, if in one answer a player wrote “a city is well-planned when most of the residents are happy with its location, how it treats the environment, its jobs, and its character,” that answer would be coded with a 1, because it refers to the satisfaction of the city’s residents. By contrast, an answer such as, “A city is well planned when a good amount of the city is environmentally friendly,” would be coded with a 0, because it does not explicitly refer to serving others’ interests.

The validity of the coding process was checked through an inter-rater reliability analysis (Kappa greater than 0.6 [19]).

#### 2.4 Data analysis: Statistical comparison

For each player, we counted the number of interview answers that mentioned the value of serving the public interest. We calculated the mean for the players’ pre interviews and post interviews, and then used a paired t-test to compare the means.

### 3. Results

Players talked about serving the public interest more often in their post interviews than in their pre interviews. For example, when asked, “what information do urban planners use?” in the pre interview, one player wrote, “I do not know.” Asked the same question in the post interview, the same player wrote: “Urban planners use information collected from people in the town to determine what the preferences are of those who live there. They look at a diverse set of data collected from the town and make goals to plan out new ways to improve the area they are working on.” This player explained that the people most affected by planning choices, the city’s residents, should have their preferences heard. Furthermore, the player connected the process of improving the area with the collection of diverse data: the opinions of a variety of stakeholders.

Players referred to the value of serving the public interest significantly more often after playing Urban Science ( $M_{pre} = 1.19$ ,  $M_{post} = 3.09$ ,  $p < .01$ ), as shown in Figure 1.

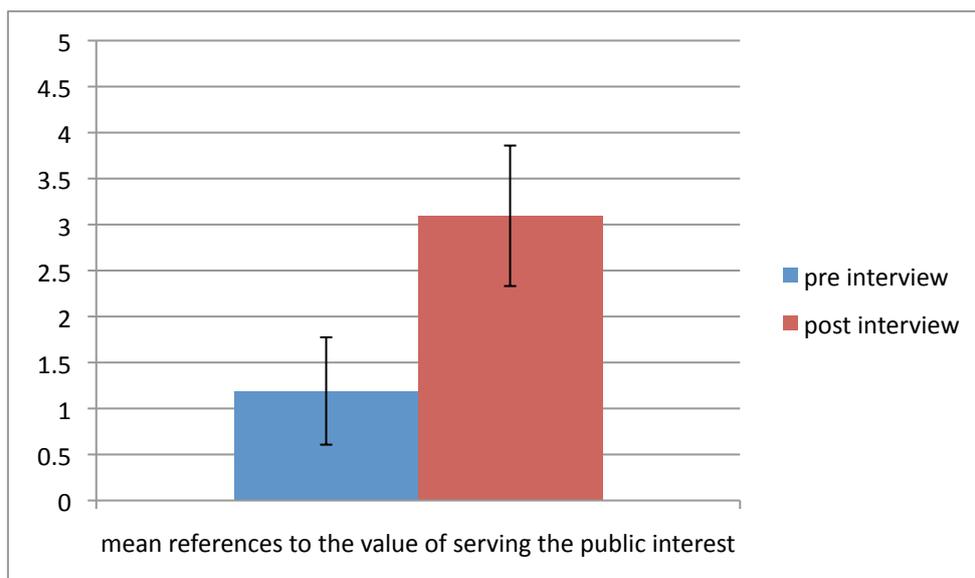


Figure 1: The change in players’ references to the value of serving the public interest. (Note: Error bars in this figure represent the 95% confidence interval around the means)

## 4. Discussion

These results suggest that Urban Science may be an effective tool for promoting civic participation. While everything in Urban Science--excluding the players and the mentors—is simulated, the kinds of stakeholder groups, the environment and social issues, and the zoning options and projected effects in the GIS tool are all carefully designed to reflect the real community. Though youth who play Urban Science do not affect their community during game-play, they do deliberate about important social and environmental issues by balancing the needs of competing stakeholder interests. By learning how planners think, and in particular, the value of serving the public interest, players are perhaps better prepared to participate in their communities. At the least, the results here indicate that through playing the game players see the value of the community's involvement in the process of planning.

The results presented here are limited. First, this preliminary study only describes what 21 players did while playing Urban Science for 10 hours. As a result, this work provides insufficient grounds for making causal claims. Further, measuring the development of professional thinking and the propensity for civic participation is a more sophisticated task than is possible in such limited space. Follow-up work that looks at a larger volume of data is already underway, and we look forward to establishing more broad claims in future papers.

Despite these limitations, epistemic games aim to provide youth with the tools and motivation to fruitfully participate in a democracy. This study indicates that epistemic games have the possibility of being educational experiences that provide youth with socially-valued ways of thinking. Simulating training experiences of explicitly civic professions could be a promising method for modeling and promoting democratic participation for youth.

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