

Statecraft X: Enacting Citizenship Education using a Mobile Learning Game Played on Apple iPhones

Yam San Chee, Ek Ming Tan, Qiang Liu
Learning Sciences Lab, National Institute of Education
Nanyang Technological University
Singapore
yamsan.chee@nie.edu.sg

Abstract—In this paper, we report on a mobile learning game, *Statecraft X*, designed and developed to enact a program for citizenship education undertaken by 15-year-old students. The game is played on Apple iPhones. Located in the Social Studies curriculum, the game represents one component of a broader learning environment that includes in-class dialogic activity to facilitate student sense making and identity construction. After briefly reviewing prior work related to mobile learning and mobile games for learning, we describe game play with *Statecraft X*. Our first field test of the game indicates that game usability is high. Students also enjoy the game play experience and learning with the game.

Keywords—citizenship education; mobile game; game based learning; *Statecraft X*; Apple iPhone

I. INTRODUCTION

Education systems, especially in developing nations, place a high value on citizenship education because educational administrators recognize the importance of nurturing students to become responsible and active citizens subsequent to leaving school. In Singapore, citizenship education is enacted via the Social Studies curriculum. This paper reports on an ongoing research project to design and develop a mobile game for use in a game-mediated Social Studies curriculum undertaken by 15-year-old students. The game, *Statecraft X* (hereafter referred to simply as *Statecraft*), is a multiplayer 24/7 server-based game that runs on Apple iPhones. The research project explores the use of a mobile learning game to pursue two distinct goals. The first goal concerns understanding how students and teachers appropriate a game designed to support students' meaning making and identity construction in the context of formal learning. The second goal relates to the manner of take-up of a mobile device for learning that crosses the boundary between school and places outside of school; for example, at a restaurant, on the bus, and at home. The use of a mobile learning game is particularly appropriate given our orientation toward enactive learning by doing. Managing the affairs of a country is an ongoing activity, requiring both projective planning as well as reactively responding to events. Adhering to a classroom schedule constrained by curriculum time, where students get to play a game only once or twice a week would seriously compromise the

authenticity of the form of game based learning that we are attempting to realize.

In the next section of the paper, we consider relevant prior work related to mobile learning in general and game-based mobile learning in particular. Next, we describe how students would experience *Statecraft* game play when the research is enacted in school. In Section 4, we briefly report on how students responded to use of the game, based on our first usability field test. The final section concludes the paper and indicates the direction of future work.

II. RELATED PRIOR WORK

Early active work on mobile learning can be traced to research centers in Europe; for example, Sharples [1] and O'Malley et al [2]. The literature suggests that mobile learning should be distinguished from simply learning with the aid of handheld devices. Instead, recognition should be given to learners who are continually on the move and to learning that takes place across multiple contexts. In particular, mobile learning embraces learning outside the classroom; it also encourages interactions between formal and informal learning [3].

Sharples [3] has characterized mobile learning as:

- conversations across contexts
- enabled by continual interaction with personal technologies
- how people artfully engage with their continually changing surroundings to create transiently stable and effective sites for learning

A more recent paper by Kukulska-Hulme, Sharples, and Milrad [4] contains a review of foundational European mobile learning projects and traces the development of a uniquely European approach to mobile learning that centers on the idea of context. The dynamic of mobile learning upsets and reconfigures stable relationships that dominate in a traditional teaching environment. In particular, relations between students, between students and their teachers, and between students and their parents are likely to undergo perturbation, leading to recalibration of power relationships, as suggested in [5].

While a sizeable number of mobile learning applications exist today, the same is not true of mobile learning games. The most significant work in this field relates to participatory simulations and augmented reality games [6, 7].

III. STATECRAFT AND GAME PLAY

Statecraft is a fantasy multiplayer strategy game designed to support play by four teams of 4–5 players per team. The action model of the game is tick based; that is, game state updates, based on players' inputs, are updated at fixed time intervals that are set by the game administrator. Students learn citizenship education through enacting the role of governors of various towns over which they have control. Through enacting governorship, they learn in a first person, experiential way what it takes to successfully govern a nation. They quickly learn that key objectives of game play are meeting the basic survival needs of town inhabitants whom they govern and the need to forge citizen buy-in and support. These objectives focus on the fundamental issues relating to political survival. From an educational and game design standpoint, we do not make life easy for students. They will quickly learn that governorship is an immensely challenging task because the towns are populated by different races—elves, dwarfs, trolls, and humans—who bear allegiance to different factions embodying diverse ideologies. This diverse set of races and factions is intended to mirror the political reality of diverse races and religions that characterize Singapore. Keeping all races and factions in a “happy” state is the unhappy lot of a governor. Game decisions related to government must be sensitively weighed, and long-term consequences of such decision carefully envisioned. Through game play, students gradually learn what decisions work. Through dialog and collaborative meaning making, they learn *why* certain decisions work well while others do not. *Statecraft* game design and game balancing seeks to help students distill four key themes related to governance in Singapore: (1) leadership is key, (2) anticipate change and stay relevant, (3) reward for work, and work for reward, (4) a stake for everyone, and opportunities for all.

Statecraft game play takes place against the backdrop of the game's back-story. At the start of the game, students find themselves in the medieval fantasy kingdom of Velar. It is populated by elves, dwarfs, trolls, and humans, with each race having its own preferences and strengths. Four different factions have established strongholds in the north, south, east, and west of Velar at the start of the game, with the center being held by the medieval lord, Topez, who exercises strong control over the central region of Velar. The game opens with the unexpected death of Topez. His death sets the stage for a power struggle between the four factions to expand their sphere of influence and to ultimately fill the power vacuum caused by Topez's untimely demise.

The game flow in *Statecraft* can be divided into four distinct phases. In Phase 1, game play engages students in the basic development of the towns that they govern. The key concern here is to provide for the basic economic needs of the town's inhabitants. These needs include food, water, housing, healthcare, and security. Different regions of the nation are also rich in different resources, including, water, food, wood, metal ore, and crystals from which jewelry is made. By design, the distribution of the natural resources wood and metal ore is scattered so as to create regional inter-

dependencies that require the establishment of trading operations to sustain economic wellbeing. Fig. 1 shows the mockup of a town in *Statecraft*, based on the current level of game development for the iPhone.

The *Statecraft* game is actually a complex server-based simulation that is connected to wirelessly. In playing the game, students deal with various in-game objects such as slums, houses, water towers, wood mills, farms, and factories. Each of these game objects can be interrogated so that details related to the object can be more deeply examined.

In Phase 2, about a quarter way through the game, students need to start attending to advanced development of their town. Game play involves students leveling up their towns to additionally provide for the education of inhabitants of the town, for the development of industry, and the pursuit of cultural activities. The incorporation of a noble house provides for non-player character (NPC) inhabitants whose behaviors are programmed by AI. Such NPC inhabitants are also used to provide “citizen feedback” from time to time to the player-as-governor. In addition, a trading post is established that allows players to begin negotiating with other players on the terms of trade so that trade exchanges can be enacted in the game space.

Phase 3 of the game, representing the third quarter of game duration, revolves around players trying to expand the sphere of influence of their faction with the goal of filling the power vacuum that arose with the passing of Topez. A diplomacy system is introduced to allow players to negotiate and establish diplomatic relations with the neighboring countries of Velar. Given the tortuous history of the region (as given in the game's back-story), students have to decide how to achieve a balance between the conflicting goals of expanding a faction's sphere of influence and power against being perceived as a threat by neighboring kingdoms.

Phase 4 of the game marks its final climax and resolution. The neighboring country of Salfreda launches an invasion of Velar. While the game players previously conceived of “success” in terms of getting the edge over other factions in the kingdom, all the players suddenly realize that they need to set aside their inter-factional differences in favor of preserving the integrity of the kingdom of Velar. The combat simulation subsystem therefore becomes vital in this phase of game play.



Figure 1. *Statecraft* interface showing town map.

Figure 2 illustrates the world map on which combat is executed. The player, belonging to the green faction, has selected one of his archers with a skill level of 1 (denoted by the symbol ^), archer points of 5, and health points of 1 (central tile with thick blue outline). Surrounding tiles within the range of the archer are highlighted with a yellow border. Within this range, the player has selected an armor unit of the blue faction as his target. The interface allows the player to execute an Attack action. On the next game tick, the status of the attacked armor unit is updated to show armor points of 8 (reduced from 10) and health points remaining at 10. The world map interface in Figure 2 also shows the number of combat points the player has in the top left corner. The top right icon provides access to the diplomacy system. The bottom right icon accesses the combat log, and the bottom left icon accesses the multiuser chat system.

If players succumb to the invasion by Salfreda, they (collectively) lose the game. If they succeed in repelling the invasion, they remain in the game. The long-term goal is to maintain a stable state of peace and prosperity. When game play terminates at the end of the three-week curriculum intervention, the team that is the most well off in terms of resources and citizen happiness may be regarded as the winner.

IV. FIRST USABILITY TEST

A first usability test of *Statecraft* was conducted with six school students around the middle of July 2009. The students belonged to one of the two schools collaborating with us on this research project. There were four boys and two girls, all 15-year-olds.

The usability study took place over the span of approximately two and a half hours in a school computer laboratory. After the study, we transcribed the student interview data. From a careful review of the data we distilled three broad themes that emanated from the students' "voices." These themes were: (1) extremely positive game play experience arising from students having a sense of personal agency and control when playing the game; (2) meaningfulness of the game play experience; (3) satisfaction with the game's user interface. (Due to space constraints, the transcript excerpts have been removed.)



Figure 2. Execution of combat on the world map.

V. CONCLUSION

In this paper, we shared our work to date on the *Statecraft* research project. We provided a detailed description of what it would be like to play the game *Statecraft*. We then indicated, from our first field test with six students, that students found the game easy to learn to use. They also enjoyed the game play experience and learning with the game.

At the time of writing, development of the game is nearing completion. Our research intervention, to be conducted with two collaborating secondary schools, will run in January 2010 when the new school year opens. At this time, we will execute the first iteration of our design research cycle.

ACKNOWLEDGMENT

The work reported in this paper is supported by a research grant from the National Research Foundation of Singapore under grant number NRF2007-IDM005-MOE-007. We thank all members of the *Statecraft* game development team: Ahmed Hilmy, Eric Salim, Daniel Gan, and Rave Tan.

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