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2017

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Recommended Citation

Gottlieb, O. (2017). Design-Based Research: Mobile Gaming for Learning Jewish History, Tikkun Olam, and Civics. In V. Šisler, K. Radde-Antweiler, & X. Zeiler (Eds.), Methods for Studying Video Games and Religion (pp. 83–100). Routledge.

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Appears In:

Gottlieb, O. (2017). Design-Based Research: Mobile Gaming for Learning Jewish History, Tikkun Olam, and Civics. In V. Šisler, K. Radde-Antweiler, & X. Zeiler (Eds.), *Methods for Studying Video Games and Religion* (pp. 83–100). Routledge.

Author's Pre-Print

Design-Based Research

Mobile Gaming for Learning Jewish History, *Tikkun Olam*, and Civics

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KEYWORDS: Design-based research, mixed methods, games and learning, religion, civic and democratic education, civics, mobile games, game design, history, history education; augmented reality games; Jewish history; Jewish education, immigrant history; labor history; women's history; place-based games

Design-Based Research

Mobile Gaming for Learning Jewish History, *Tikkun Olam,* and Civics

Owen Gottlieb

How can *Design-Based Research* (DBR) be used in the study of video games, religious literacy, and learning? DBR uses a variety of pragmatically selected mixed methods approaches to design learning interventions. Researchers, working with educators and learners, design and co-design learning artifacts and environments. They analyze those artifacts and environments as they are used by educators and learners, and then iterate based on mixed methods data analysis. DBR is suited for any "rich contextualized setting in which people have agency." (Hoadley 2013) such as formal or informal learning environments.

The case covered in this chapter is a mobile *Augmented Reality Game* (ARG) called *Jewish Time Jump: New York.* The game was developed to teach modern Jewish history at the intersection of immigrant, women's, and labor history. The data sets include digital player logs of moves in the field, pre- and post-surveys, semi-structured interviews, and participant observation, including observations of learners in the field recorded on video and audio.

The primary research question of the case study addressed in this chapter, which is a sub-set of a much broader study (Gottlieb 2015b), is: How can mobile history ARGs better provide a best-case, fair hearing for opposing perspectives? This research question is relevant to parallel learning goals in Jewish history education, civic education, Jewish social justice education, and social studies education.

The results of the research revealed that through a suite of techniques, here referred to as "bias mirroring," learners demonstrated the ability to articulate an opposing perspective previously not articulated. In addition, learners did not demonstrate the confusion that was at times evident during earlier iterations. With the last round of iterations, which included the bias

mirroring techniques, there was demonstration of a best case, fair hearing for an opposing perspective.

Theoretical Background

A variety of bodies of literature provide the backdrop for this study. These include Games for Learning research and sub-fields of mobile learning and ARGs for learning history. Other relevant bodies of literature include history education, Jewish education, and civic and democratic education. For a background on DBR methods, please see the Methods section.

Games for Learning

This research is situated within contemporary disciplines of Games for Learning research, a field that draws from the learning sciences, game and media studies, educational psychology, computer science, and a variety of interdisciplinary fields. Games for Learning research seeks to draw from and leverage the affordances of digital and analog games to provide the kind of rich learning seen in the best video game systems. Examples of aspects of good video games that demonstrate positive learning environments include just-in-time learning, scaffolding for learning, and the opportunity for players/learners to continually make attempts at problem solving. While Games for Learning has a long history, dating back to the 1970s with Fred Goodman and his team's work at the University of Michigan (Gottlieb 2015a), the boom in research since the turn of the century has been led philosophically by James Gee (2003). Some of the more recent accounts of how video games can impact learning include Squire and Steinkuehler (2014) or meta-analyses by Sitzmann (2011) and Wouters, van Nimwegen, van Oostendorp and van der Spek (2013).

One of the sub-fields of Games for Learning is the study of mobile gaming and mobile ARGs. This research focuses on subjects such as the facilitation of self-directed learning, students' ability to carry devices with software toolsets into the field with them (such as for the

study of environmental science or field ethnography), and the experience of historic sites with additional layers of media and data (Dikkers, Martin and Coulter 2012; Gottlieb, Mathews, Schrier and Sly 2014; Holden and Sykes 2012; Klopfer 2008; Schrier 2005; Sharpies and Pea 2014; Klopfer and Squire 2008).

Teaching History, Teaching Jewish History, and "Jewish History Education"

I approached design for this learning intervention from a pedagogical perspective situated at the intersection of teaching Jewish history in secular settings and the practice of "Jewish history education." For Barton and Levstik (2004) and the case discussed in this chapter, history education is understood as a means of preparing and encouraging learners to be responsible citizens in a pluralist democracy (Barton and Levstik 2004). Here, history education is directly related to civic and democratic education.

In secular settings, such as university or high school courses, "Jewish history" is understood as the history of a group of people, whose experience is a reflection of wider human circumstances (R. Chazan, personal communication, January 2014). Meanwhile, "Jewish history education" has additional aims; it

> is not merely an academic matter; rather, it aims to bolster Jewish identification and commitment among the rising generation. Specifically, the aims of Jewish history education are to develop within Jewish youth an appreciation of the Jewish past and a commitment to Jewish continuity; trust in Jewish culture, values, customs, and community; an understanding of historical and contemporary Jewish issues and problems; and the ability and will to participate actively in Jewish life.
> (Jacobs and Shem-Tov 2011: 442)

Jacobs (2013: 47) also proposes that "the American Jewish education enterprise shift its focus from cultivating good citizens of the Jewish community, which we have dubbed 'Jewish citizenship education,' to cultivating good Jewish citizens of the world." Jacobs (2013: 47) terms this "Jewish cosmopolitan education."

The game in the case study centers on the Uprising of 20,000, an important but underappreciated moment in American, immigrant, women's, labor, and Jewish history. It is an appropriate topic for secular settings teaching early twentieth century American history as well as sites of specifically Jewish education supplementary Jewish schools. Jewish history is always intertwined with the history of other peoples (H. R. Diner, personal communication, February 2012). As such, the game includes Irish, Italian, and other immigrant characters and historical figures while providing an opportunity for learners of Jewish background to learn about their own heritage and explore compelling stories about little known characters and events in Jewish history.

Civic Education, a Best Case, Fair Hearing, and Tikkun Olam

Civic and democratic education themes in *Jewish Time Jump: New York* include teaching about issue-based advocacy, citizen journalism, and understanding power analyses.

Iterations of the game's design focused on critical aspects of civic and democratic education such as providing a best case, fair hearing (Kelly 1986; Stoddard, Nemacheck and Banks 2013) and communicating the enduring nature of historic themes (Barton and Levstik 2004). In evaluating games for civic education, Stoddard and colleagues draw on Kelly (1986: 310-311), emphasizing the importance of the inclusion of different political viewpoints and a best case, fair hearing of competing points of view.

Barton and Levstik (2004) describe the moral response stance regarding (secular) history education as one that deals with remembrance as well as subjects for condemnation (Hitler, slavery, the Holocaust) and admiration (Abraham Lincoln, Harriet Tubman). They describe the different kinds of reactions history teachers seek:

> In a pluralist democracy, we hold differing visions, and a major purpose of public schooling must be to help students compare those differences and, where possible, transcend them. When people move beyond their old, narrow visions to new, more inclusive ones, hope and history can rhyme, as Seamus Heaney puts it.

(Barton and Levstik 2004: 91-92)

Tikkun olam, which is Hebrew for "healing the world," refers, in contemporary parlance, to social justice concerns (see Krasner 2014, for the history of the term). Cohen and Fein (2001) note the critical importance of social justice for contemporary Jewish identity, with a three-to-one majority of their respondents affirming that a commitment to social justice was the heart of their understanding of Judaism, and with 47% choosing "a commitment to social equality" as the quality "you consider most important to your Jewish identity," while religious observance polled at a mere 24% (Cohen and Fein 2001: 2).

A best case, fair hearing of alternative perspectives is critical for developing an informed approach to *tikkun olam* and Jewish social justice education, along the lines of Jacobs' (2013) notion of cosmopolitan education and nurturing good Jewish citizens of the world.

Methods

To the best of my knowledge, prior to my research upon which this chapter was based, there has been little or no use of DBR in the study of religion and games. There has been use of design experiments in Jewish education classrooms (Sigel 2008, 2009, 2010), specifically in the study of teaching midrash (rabbinic homiletic and exegetical literature). However, Sigel's work did not involve games or technology and was not using the DBR methodologies as applied here.

Design-based research is an iterative, proto-theory-testing approach to developing learning theory and design knowledge. Designer-researchers prototype a learning environment or intervention over the course of a number of iterative cycles comprising design, field trial, data gathering, analysis, and return to design. Learning theory is used as a starting point for design, and that theory is held suspect (a learning sciences term meaning

"held in doubt") during investigation. Data gathering can involve any number of diverse and mixed-methods approaches, as appropriate to both the research questions and the learning context, whether that context is formal or informal. It is advisable to "over gather" data because that data store can then be mined as the relevant sub-questions evolve over the course of the iterations as new developments arise in context (Hoadley 2013, Hoadley, personal communication, 2012). Design narratives using thick description of the processes are one way to approach the communication and condensation of the research (Hoadley 2002, 2004a, 2004b).

The target outcome of DBR is design-relevant social science. Edelson (2002) delineates three types of theory that can be developed through design research: domain theories, design frameworks, and design methodologies. Other forms developed in DBR include design patterns, design stages, design roles, design values, and design principles (Hoadley 2013). The ultimate purpose of DBR is to arrive at new knowledge by testing the learning theories that motivated the design in the first place (Design-Based Research Collective 2003; Sandoval and Bell 2004).

Design-knowledge, such as a design principle, is tentatively generalizable. For example, as a principle is used across contexts, it gains generalizability, but given the context specific nature of the interventions, generalizability must also be expressed along with the contexts from which it was derived.

DBR was influenced by and in part grew out of design experiments dating back to Collins' (1992) and Brown's (1992) work. I make a distinction between learning experiments and DBR based on methodological shifts, which can be traced back to the period of the Design-Based Research Collective (2003), who set forth a series of characteristics of good DBR. While DBR continues to evolve, these basic notions are helpful for a basic understanding of DBR:

1. The central goals of designing learning environments and developing theories or "prototheories" of learning are intertwined.
2. Development and research take place through continuous cycles of design, enactment, analysis, and redesign. (Cobb 2001; Collins 1992 as cited by the Design-Based Research Collective 2003: 5)
3. Research on designs must lead to sharable theories that help communicate relevant implications to practitioners and other educational designers.
4. Research must account for how designs function in authentic settings. It must not only document success or failure but also focus on interactions that refine our understanding of the learning issues involved.
5. The development of such accounts relies on methods that can document and connect processes of enactment to outcomes of interest.
(Design-Based Research Collective 2003: 5)

DBR is highly interventionist (Cobb, Confrey, diSessa, Lehrer and Schauble 2003; Sawyer 2007) and based in pragmatics. Theories are judged by their impact in the world rather than truth claims (Barab and Squire 2004). As noted briefly above, DBR is suited for any "rich contextualized setting in which people have agency" (Hoadley 2013). In such settings, methods such as large Randomized Control Trials (RCTs) would not provide the kind of useful data that more context-sensitive methods could provide. Formal and informal learning occurs in rich contexts, such as classrooms or after-school programs, not in controlled laboratory settings. A pragmatic approach requires that the mix of methods is chosen to best suit the context and the research questions.

Why DBR for Religion, Education, and Games?

DBR is particularly appropriate for a study involving the design and field-play of a digital game for learning because it "blends empirical educational research with the theory-driven design of learning environments [and] is an important methodology for understanding how, when, and why educational innovations work in practice" (Design-Based Research Collective 2003: 5). It is especially useful in researching novel teaching environments and for developing contextualized theories of teaching and learning (2003: 8).

Case Study—*Jewish Time Jump: New York*

Jewish Time Jump: New York is a digital, mobile augmented reality game and simulation designed to teach modern Jewish history on site in New York City. In a mobile history ARG, media from the past, such as still photographs, are layered over the location on which the player stands. For example, a photograph from the same location may appear when the player is on site, but from 100 years in the past. Primary source artifacts and ephemera can be displayed and viewed on the mobile device.

Over the course of developing and researching *Jewish Time Jump: New York,* I generated an initial pilot version of the game informed by theory as well as five years of experience teaching in Jewish supplementary schools. Then, over the course of play with a number of student groups, I iterated the game based on gathering and analyzing field data, applying the discoveries from the data into each iteration. All the while I worked towards the goal of uncovering new design knowledge.

In the game and simulation, players take on the role of reporters traveling back through time for the fictional *Jewish Time Jump Gazette.* Playing on location with their mobile devices, players are tasked by their editor from the future to find a story "lost to time." Players are aided by their time-travel device companion, The Chronometer, as they play on location in Washington Square Park in Greenwich Village, New York. Through investigating, meeting digital characters, taking part in simulated historic events, gathering different perspectives and points of view, and analyzing primary sources on the mobile device, players engage in historic inquiry. Players can change their digital character's garb to blend in with either the workers or the owners and experience different reactions from digital characters.

The Narrative Moments of the Game

Jewish Time Jump: New York opens during The Uprising of 20,000 in 1909, which remains the largest women-led strike in US history, when a number of young women, many of whom were Jewish, led an estimated 30,000 shirtwaist workers out into the streets on strike from the

garment factories. They struck over dangerous working conditions, harassment, and a wage-ticketing system that meant they often forfeited portions of their already meager wages (the tickets were tiny, the women's clothes had no pockets, and the tickets were easily lost). The Uprising took place 11 years before women had the right to vote. As a result of the Uprising and related campaigns, nearly all of the factories unionized, with the exception of a few of the largest and most powerful—including the infamous Triangle Shirtwaist Factory in which two years after the strike, in 1911 146 workers, mostly young Jewish and Italian girls and women, died in a fire. The tragedy is understood to be a foundational moment in the American labor movement and led to key reforms. Toward the end of the game, players time-travel to the site of the Triangle Factory fire, just a block from the park, gathering more of the story to bring back to their editor in the present. Players also meet contemporary figures who address enduring themes raised in the game, tying the historic moments to current labor struggles.

The Game Platform, Game Days, and Players/Learners

Jewish Time Jump: New York was designed on the ARIS platform for mobile games and simulations. ARIS stands for Augmented Reality and Interactive Storytelling, and is a client-server technology that runs on iOS (iPhone and iPad) mobile devices. The game was designed for fifth to seventh grade students in after-school Hebrew supplementary schools, tourists, and secular student groups.

The DBR methods were conducted over a series of in-field Game Days, the surrounding days, and subsequent design iterations. I gathered data through the following instruments: participant observation including audio and video observation, pre- and post-game surveys, semi-structured interviews and debrief sessions, follow up semi-structured interviews, player data gathered from the servers (all player moves in the game), and a follow-up website with links to further reading. Game Days included surveys, a tutorial in playing

the GPS system, in-field game play, and debrief and group discussion with semi-structured interviews.

Forty-three learners from Jewish supplementary schools participated in gameplay over the course of six game events and three design iterations. Game Days occurred over the course of a number of months, based on availability of participants and the generation of new design iterations. Group sizes ranged from 18 players to one player who played in a closely monitored late-stage game (DBR can be conducted even with individual learners). The average group size was seven players. In all, 24 girls and 21 boys participated. Two of the boys did not fill out post-game surveys, so the pre- and post-game measures do not include those two boys.

Key Question: Is It Possible to Provide a Best Case, Fair Hearing?

Because of the particular historical narratives in the game, *Jewish Time Jump: New York* provided a unique opportunity to explore an edge case for best case, fair hearings. The Triangle Shirtwaist Factory owners are often read strictly as villains given their refusal to unionize, followed by the tragic results of their unsafe management practices such as locked doors and fire escapes that broke easily. Von Drehle (2004) has even suggested that the owners made the factory more likely to ignite as part of planned insurance fraud. Given its role as a landmark moment that led to worker protection laws, the Triangle Shirtwaist Factory fire can be seen as a rare moment in history when the contrast between right and wrong appears to be overwhelmingly clear.

Would it be possible to provide a game environment built around contested narratives and perspectives in this circumstance? Would learners even be willing to explore the perspectives of the factory owners? It is not the case in the study of history that every perspective deserves a best case, fair hearing—for example, a racist case. But in this case, could the perspectives of factory owners, whose actions were exploitative at best and deadly at worst, be better understood? The iterations revealed, perhaps ironically, that the clarity of

wrongdoing in the case of the fire actually made for clear demarcations of a fair hearing in the design-based research process. To what extent would learners be able to even recount the perspectives of the factory owners presented during the 1909 Uprising, not only after hearing the cases of the striking workers, but even after learning of the fire?

How might learners better understand the perspectives of the owners of the Triangle Factory, Max Blanck and Isaac Harris? They were immigrants themselves in the late 1890s and had worked their way up through sweatshops. They faced harsh working conditions in dark, poorly ventilated tenement house rooms, ripe for the spread of tuberculosis (Von Drehle 2004: 11-21). These conditions were in many respects worse than those in the factories they would later oversee. The article "The Jewish Bosses Were Exploiters—and Role Models" by Diner (2011) provides keys to promoting a "fair hearing" of the perspectives of the owners within the game—transcending the oft-reported vilification of the bosses without condoning their actions. For instance, Diner notes that in addition to resenting or fearing the bosses, workers also aspired to Blanck and Harris' success. Blanck and Harris were also from the same community as many of their workers—the Jewish community. Diner (2011) also points out that the distance between the bosses and workers was not always a great one. For example, one of the male victims of the Triangle fire was engaged to be married to the niece of one of the owners. These complex and nuanced relationships between Jewish bosses and Jewish employees provide helpful context for supporting a fair hearing of the bosses' perspectives, as the iterations below illustrate. DBR is focused in this case on how the game might allow for sharing this complexity with the learners.

Data Sources, Volumes, and Triangulation

Players generated vast quantities of data that had to be reviewed. That data was triangulated and cross-referenced to find answers to the research questions. There were approximately 192 hours of game day participation by learners, of which approximately an hour-and-a-half per

player was in game play specifically. Data logs were CSV files pulled from the ARIS server. These data logs tracked each player's every move, generating thousands of lines of data (approximately 800 lines per player and approximately 32,000 lines of data across players). Log files were examined for individual user traces. Each data line allowed cross-referencing by player (whose identities were held as codes in a separate document). See the next section for an example of user tracing in triangulation. The line of data also provided longitude, latitude, any digital object or event (node) encountered during play, and time. By looking closely at these data, cross-referencing with node charts, and comparing with qualitative data, primarily video footage, I was able to develop a thick reproduction of the play events related to the research questions.

Video footage of gameplay and debriefing totaled approximately 40 hours across multiple cameras. Audio recording, which also included "hanging out" (here, hanging out is used in the anthropological, participant observation sense) with educators, administrators, and clergy, comprised an additional 15 hours (in addition to the 40 hours of gameplay footage, which sometimes included educators, parents, administrators, and clergy). Approximately 50 educators, parents, administrators, and clergy were present over the game days or during the pre-game and post-game interaction. Additional learner interviews post-play totaled approximately five hours. All audio and video was reviewed. Fourteen primary play and discussion recordings were reviewed multiple times. Transcription of the footage and interviews was selective and centered on answering questions regarding specific play scenarios or questions raised in surveys and debriefing sessions. Part of this process meant matching logs to nodes (see description of nodes above). Translation tables from the server were used to provide references back to in-game objects.

Survey sets that included both pre- and post-game surveys totaled 41. These were modeled and manually color-coded for visual checking, preparation for descriptive statistics in

the case of possible significance, and tracking of open responses. Results of the survey were used in post-game interviews and for selective case analysis of the video footage. Sometimes video footage led back to the surveys. This was a flexible mode of arriving at a more full description of what was occurring during play.

Example of Data Triangulation Method

To address the research question about learners being able to present an articulation of owners' perspectives, I started with the debriefing footage, notes, and open responses. Each learner in the discussion could then be traced back to her or his play through the server logs to determine answers to questions, such as whether or not this student encountered a specific item, character, message, or stage in the game. Video footage of actual play was available for many, but not all, players. In the cases in which the video footage was available, I returned to the moment on video when the learner encountered the digital asset and viewed the learner's talk-practice, reaction, discussion, and movement. I moved back and forth between a learner's responses in the video and her or his responses on the surveys and/or in the group debriefing and individual interviews. In this way, gameplay provided context for after-play discussions and vice-versa. Survey questions, particularly open responses, could be paired with play data and observational footage. Confirming and disconfirming accounts were both taken into account when formulating warrants for claims.

Synopsized Iteration Descriptions

The following synopses reflect only the changes in the intervention related to the problem of the best case, fair hearing. Numerous changes were made to address other learning goals; those are not addressed here. These are not full thick case descriptions, which are a number of pages long, but rather short synopses of the longer detailed descriptions. For full detailed descriptions see Gottlieb (2015b).

Initial Design—Pilot Results

Some learners did not encounter Max Blanck, one of the Triangle Shirtwaist Factory Owners, in the pilot due to placement of the character—players choosing an alternative path could move around Blanck without ever interacting with the character. Learners were not able to articulate the perspectives of the factory owners. I hypothesized that this may also be due to prior exposure or knowledge of the story, as pre-surveys indicated exposure to local museums that may have presented the story of the Triangle Factory Fire. I also hypothesized that perhaps there was an effect (Theriault 2013) due to learning union organizers' opinions earliest in the game. The game narrative itself, included the fire two years after the Uprising, could be understood as an indicator of the guilt of factory owners.

Iteration 1

I shifted the first encounter with Blanck to earlier in game play in order to lessen possible primacy effect of having too many anti-boss perspectives early in game play. Players would now have to encounter Blanck and could not choose to move around him by avoiding the GPS marker on the digital map. Additionally, in non-player character (NPC) dialogue, I elevated similarities between the owners and workers, as noted by Diner (2011). The owners worked their way up through sweatshops, which were worse than the factories that they were overseeing 1909, and faced tuberculosis in cramped tenement sweatshops. I added priority markers that players had suggested in post-game interviews in order to highlight areas of the pervasive narrative that might deserve greater attention.

Field Results for Iteration 1

Server logs indicated that all players in the iteration had encountered Blanck; however, players were still not able to articulate the owners' perspective and many were confused as to whether he was a worker or a factory boss (he was both, in succession). Players could now recount

that Blanck had been a worker, but could not articulate the owners' perspective. One fifth-grade girl said:

> I'm surprised that they [the owners] couldn't relate to the workers because they were talking about how they had to work in those sweatshops at one point and they were saying how the conditions were so much better but then at the end… the Triangle Factory Fire... how can they not realize that they are doing the same things to their workers that their bosses did to them when they were working in the sweatshops?

This learner appears to understand the shared background of the owners and the workers, but does not yet articulate the perspective of the owners. She does not cite their business concerns nor what the owner characters express as their motivation for their actions (competition, which the owner NPCs had shared with the player). She does not accept the distinction between the sweatshops and the factories, despite the distinctions raised by the owner character, such as tuberculosis deaths in sweatshops. While it is not important that she agree with the owners, it is important that she can understand their perspective.

Iteration 2

I next locked players in to the entire conversation with Blanck. Up until this point, they had the ability to leave part of the way through the conversation and elect to only participate in part of the conversation. They would have to now complete the conversation before moving on in the game. I also simplified the language of the Blanck NPC to short declarative statements such as "I was a worker."

Field Results for Iteration 2

Despite the changes, there was still significant confusion as to the story of the bosses, and only one player partially articulated the position of the owners. It was a partial articulation because he did not draw from the information presented by the Blanck NPC in the game regarding Blanck's background as a worker in much more challenging working conditions.

The player cited only the fear of losing money (which was presented by Blanck and Harris later in the game).

Iteration 3

For the third iteration, I returned to theory to determine other possible paths to greater student articulation of the perspective of the owners. Theriault (2013) shows how "framing a game" (the way in which the game is described prior to play) can accentuate bias and affect player outcomes. Following a similar line of thought, could the learners' prior knowledge of this period in labor history based on museum visits and family discussions (which I learned of through the demographic section of the surveys) be having a similar impact? If the tentative assumption is that there may be' framing and/or primacy effects interfering with a best case, fair hearing, what design elements might better provide for a best case, fair hearing? I turned to suture theory (Mulvey 1975; Silverman 1983) and audience surrogates (David Milch, personal communication, 1998). Suture theory addresses how an audience identifies with characters in the text; audience surrogates are characters placed within the narrative to voice the perspective of the player/audience member. I theorized that perhaps having the NPC, Blanck, demonstrate prejudice towards the player might rouse the player from a position of dismissal to one of engagement or consideration.

In the new iteration, a minor dialogue line change was made to the Foreman character, removing his claim that the bosses will tell the player "you are lucky to have a job" if they complain about having been shorted pay.

In addition, I injected a set of three interrelated elements which I call "bias mirroring:" first, new dialogue so that Blanck would treat the player in a prejudicial way, assuming the player is a worker (if the player has worker garb activated) who had already made up her/his mind against Blanck. Also, I injected a line of dialogue for the player-character as a "force" (also called an "on-rails moment," when the player is not in control of their own movements,

actions or dialogue) trying to explain that they player was actually a reporter, not a close-minded worker, but Blanck interrupts them and will not listen. "Wait! I need to hear your story. I'm not a worker, I'm a report—"

It is important to note that previous on-rails moments for the player character (PC) had been paced such that responses were tracking the player's logical choices, not enforcing a perspective. The third step was to follow the injected line with the narrator explaining that the player will have to gain Blanck's trust. This set of three moves—paced PC forces, having the NPC mirror the player bias or prejudice, and pointing out the lack of trust by the narrator, I refer to as a whole as "NPC bias mirroring."

Field Results for Iteration 3

Following the third iteration, in post-play semi-structured discussions, no learners out of 12 expressed confusion regarding Blanck or Harris' perspectives. One sixth-grade girl and her brother expressed the perspective of the business owners: they were once workers themselves and that they felt that the conditions were much better in the modern factories that they had built. The girl expressed the differences the owners discussed between the sweatshops of the past and the modern factories. This was a marked difference from previous iterations, as no student had previously expressed the owners' position of relative improvement for the workers without also dismissing that position.

A fifth-grade boy (Scott, a pseudonym) in an individual interview offered the following when asked about general interest over the course of play:

> *OG:* What part or parts of the game were most interesting to you?
> *Scott:* Some of the most interesting parts of the game was like talking to all those people and hearing the different perspectives. Like the bosses were saying "We're going to go out of business if we raise their wages and the other companies are going to swoop [makes a downward swooping/chopping gesture with hand] in and take everything from us." And meanwhile the workers are saying, "They're treating us horribly." So it's kind of [makes balancing gesture with hands, like a scale] trying to balance everything. And it's interesting, it's kind of interesting to see how that struggle kind of happened, how the bosses' perspective is actually understandable instead of saying, "I just want to make

more money," like he just said, "We're not doing that well and if we raise the wages then it's not going to work that well for us."

OG: So you found it interesting that there were different perspectives?

Scott: Yeah, and how there was like—I also didn't know like about the bosses having a union—to fight the workers.

OG: [making a distinction between "union" and "organization"] Their [the bosses'] organization.

From the semi-structured group interview data, no students fully demonstrated a best case, fair hearing of an alternative perspective prior to iteration three, while there appears to be some success in iteration three. No learner indicated confusion in iteration three. As a result, the responses of the learners suggest that that the techniques of bias mirroring may very well open the learner to a fair hearing of competing perspectives. Although the slight alteration in the Foreman dialogue is confounded because the change occurred in the same iteration as the bias mirroring techniques, because it was one of many examples of narrative elements promoting a bias against the owners, its removal is unlikely to be the cause of the shift.

By analyzing data from each iteration, monitoring theory-informed changes, and gathering and analyzing data again, I was able to determine the point at which learners began to articulate the perspective of the owners. The design-knowledge generated from the research is that the use of this three-element suite of "bias-mirroring" can be used to promote the articulation of a best-case, fair hearing of an opposing point of view. While the internal mechanisms of the suite are not fully unwrapped, there is data to support the shift in lack of confusion and ability of learners to articulate the previously un-articulated perspective.

Discussion

DBR is responsive to and descriptive of context. It allows for testing hypotheses in live learning settings. The limits of DBR are similarly related to context. The tentative generalizability means that design knowledge across contexts requires testing.

Nonetheless, design knowledge garnered from DBR could allow for advancement in terms of both understanding learning and understanding more effective designs for religious

learning goals. Claims for warrants (a term for evidence in the learning sciences) need to be specific and take into account confirming as well as disconfirming accounts. Triangulation of data is important as single instruments such as pre- and post-surveys or server data will not give a complete picture. It is the interaction between data sources that will likely provide the best indicators. Transparency in terms of possible confounds is also important, and such confounds for this study are specified in the full study. One example is that because many simultaneous changes are made in the course of an interaction, the outcomes cannot always be clearly linked to specific changes.

When considering a methodology, or set of methods, it is always important to consider counterarguments. Confrey (2007) provides an overview of a number of areas of critique and challenge to what he calls "design studies." Confrey refers to Shavelson, Phillips, Towne and Feuer (2003) and their discussion of common challenges, including design studies' generalizability, potential for replication, and possible warrants of cause. The answers to these challenges are that design studies are closer to case studies and ethnographies, seeking levels of detail rather than broad patterns. In addition, rather than scaling up to wide practice, design studies can help practitioners make sense of their own experiences (Confrey 2007: Kindle location 6120). Confrey turns to Dede (2004) regarding the criticism that design studies were overly methodologized and underconceptualized. Dede notes that only 5% of the data collected was used to make findings and therefore the method collects far more data than it can "manage" (Confrey 2007: Kindle location 6133-6134). Confrey feels the methodology itself, including daily logs of activities, addresses Dede's concerns regarding principled variation. Hoadley (2013) also notes the value of "over gathering," data as mentioned above.

Confrey notes the challenges regarding fit and validation in modeling (Sloane and Gorard 2003), considering it an interesting challenge. Confrey uses iteration as an inherent test of fit for a model and suggests that wider validation is better suited to other methods,

acknowledging that ideally, such validation could be incorporated into design studies (Confrey 2007: Kindle locations 6134, 6149). Finally, Confrey cautions that equity is an issue that had not been considered sufficiently in design studies, raising the questions of who benefits from the studies and who loses given the power relations used in developing the research. Referring to his own earlier writing (Confrey and Makar 2005), Confrey calls for questions to be raised about how knowledge is generated from design studies, and how it "is distributed across members of a class and ways in which that knowledge is shared, partitioned, authorized, and accessed" (Confrey 2007: Kindle location 6149). Given the nature of academic publishing, this is still a concern, though academic/non-profit partnering such as the work I have done with ConverJent allows for the opportunity to share gleanings in the field with learners. It is not only through academic publishing that new design knowledge can be shared. New open journals such as *gamevironments* also can allow for sharing of new knowledge about religion and games.

Religious communities seek to pass down heritage tradition in both formal and informal educational settings. DBR is an approach to methods particularly useful in the study of video games used for religious education and the acquisition of cultural practices. Understood in the context of articulated learning goals, DBR can help to assess the learning goals in the context of interventions, and in so doing assist religious communities in designing more effective learning environments. By pragmatically selecting mixed methods specifically relevant to key research questions, DBR allows for research investigations that are often closed by other less pragmatically oriented methods. Learning environments are inherently complex. If we are to deepen our investigations into the passing of religious history and heritage and creation of new cultural production through games, simulations, and digital learning environments, DBR provides an important methodological path to following such lines of research.

Acknowledgements

Portions of this chapter are drawn from Gottlieb (2015b).

References

Barab, S. and Squire, K. (2004) 'Design-Based Research: Putting a Stake in the Ground', *Journal of the Learning Sciences*, 13: 1-14**.**

Barton, K. C. and Levstik, L. S. (2004) *Teaching History for the Common Good*, New York: Routledge.

Brown, A. L. (1992) 'Design Experiments: Theoretical and Methodological Challenges in Creating Complex Interventions in Classroom Settings', *Journal of the Learning Sciences*, 2: 141-178.

Cobb, P. (2001) 'Supporting the Improvement of Learning and Teaching in Social and Institutional Context', in S. Carver and D. Klahr (eds.) *Cognition and Instruction: Twenty-Five Years of Progress*, Mahwah: Lawrence Erlbaum Associates.

Cobb, P., Confrey, J., diSessa, A., Lehrer, R. and Schauble, L. (2003) 'Design Experiments in Educational Research', *Educational Researcher*, 32: 9-13.

Cohen, S. M. and Fein, L. (2001) 'American Jews and Their Social Justice Involvement: Evidence from a National Survey', *Amos: The National Jewish Partnership for Social Justice*. Available at www.bjpa.org, accessed 20 July 2017.

Collins, A. (1992) 'Towards a Design Science of Education', in E. Scanlon and T. O'Shea (eds.) *New Directions in Educational Technology*, Berlin: Springer.

Confrey, J. (2007) 'The Evolution of Design Studies as Methodology', in *The Cambridge Handbook of The Learning Sciences*, New York: Cambridge University Press.

Confrey, J. and Makar, K. (2005) 'Critiquing and Improving the Use of Data from High-Stakes Tests with the Aid of Dynamic Statistics Software', in C. Dede, J. P. Honan and L. C. Peters (eds.) *Scaling Up Success: Lessons Learned from Technology-Based Educational Improvement*, San Francisco: Jossey-Bass.

Dede, C. (2004) 'If Design-Based Research Is the Answer, What Is the Question? A Commentary on Collins, Joseph, and Bielaczyc; diSessa and Cobb; and Fishman, Marx, Blumenthal, Krajcik, and Soloway in the JLS Special Issue on Design-Based Research', *Journal of the Learning Sciences,* 13(1): 105-114.

Design-Based Research Collective (2003) 'Design-Based Research: An Emerging Paradigm for Educational Inquiry', *Educational Researcher,* 32: 5-8.

Dikkers, S., Martin, J. and Coulter, B. (2012) *Mobile Media Learning: Amazing Uses of Mobile Devices for Learning,* Pittsburgh: ETC Press.

Diner, H. R. (2011) 'The Jewish Bosses Were Exploiters—and Role Models', *The Jewish Daily Forward.* Available at http://forward.com/articles/136228/the-jewish-bosses-were-exploiters-and-role-model, accessed 27 S 2017.

Edelson, D. C. (2002) 'Design Research: What We Learn When We Engage in Design', *Journal of the Learning Sciences*, 11: 105-121.

Gee, J. P. (2003) *What Video Games Have to Teach Us about Learning and Literacy,* New York: Palgrave Macmillan.

Gottlieb, O. (2015a) 'Jewish Games for Learning: Renewing Heritage Traditions in the Digital Age', in H. Campbell (ed.) *Digital Judaism: Jewish Negotiations with Digital Media and Culture,* New York: Routledge.

Gottlieb, O. (2015b) *Mobile, Location-Based Game Design for Teaching Jewish History: A Design-Based Research Study*, New York: New York University Press.

Gottlieb, O., Mathews, J., Schrier, K. and Sly, J. (2014) 'Mobile History Games: Challenges, Frameworks, and Design Principles', in *GLS 10 Proceedings,* Madison: ETC Press.

Hoadley, C. M. (2004a) 'Fostering Productive Collaboration Offline and Online: Learning from Each Other', in M. Linn, E. A. Davis and P. Bell (eds.) *Internet Environments for Science Education,* Mahway: Lawrence Erlbaum Associates.

Hoadley, C. M. (2004b) 'Methodological Alignment in Design-Based Research', *Educational Psychologist,* 39: 203-212.

Hoadley, C. M. (2013) 'Design-Based Research', Lecture. ECT, PhD Colloquium, New York University.

Hoadley, C. P. (2002) 'Creating Context: Design-Based Research in Creating and Understanding CSCL', in *Proceedings of the Conference on Computer Support for Collaborative Learning: Foundations for a CSCL Community, CSCL '02,* Boulder, CO: International Society of the Learning Sciences.

Holden, C. and Sykes, J. M. (2012) 'Mentira: Prototyping Language-Based Locative Gameplay', in S. Dikkers, J. Martin and B. Coulter (eds.) *Mobile Media Learning: Amazing Uses of Mobile Devices for Learning,* Pittsburgh: ETC Press.

Jacobs, B. M. (2013) 'Problems and Prospects of Jewish Education for Intelligent Citizenship in a Post-Everything World', *Diaspora, Indigenous, and Minority Education,* 7: 39-53.

Jacobs, B. M. and Shem-Tov, Y. (2011) 'History: Issues in the Teaching and Learning of Jewish History', in H. Miller, L. Grant and A. Pomson (eds.) *International Handbook of Jewish Education, International Handbooks of Religion and Education,* Dordrecht: Springer Netherlands.

Kelly, T. E. (1986) 'Discussing Controversial Issues: Four Perspectives on the Teacher's Role', *Theory & Research in Social Education,* 14: 113-138.

Klopfer, E. (2008) *Augmented Learning: Research and Design of Mobile Educational Games,* Cambridge: MIT Press.

Klopfer, E. and Squire, K. (2008) 'Environmental Detectives: The Development of an Augmented Reality Platform for Environmental Simulations', *Educational Technology Research and Development* 56: 203-228.

Krasner, J. (2014) 'The Place of Tikkun Olam in American Jewish Life', *Jerusalem Center for Public Affairs.* Available at http://jcpa.org/article/place-tikkun-olam-american-jewish-lifel, accessed 20 July 2017.

Mulvey, L. (1975) 'Visual Pleasure and Narrative Cinema', *Screen,* 16: 6-18.

Sandoval, W. A. and Bell, P. (2004) 'Design-Based Research Methods for Studying Learning in Context: Introduction', *Educational Psychologist,* 39: 199-201.

Sawyer, R. K. (ed.) (2007) *The Cambridge Handbook of the Learning Sciences,* New York: Cambridge University Press.

Schrier, K. (2005) *Revolutionizing History Education: Using Augmented Reality Games to Teach Histories.* PhD thesis. Massachusetts Institute of Technology, Department of Comparative Media Studies.

Sharpies, M. and Pea, R. (2014) 'Mobile Learning', in R. K. Sawyer (ed.) *The Cambridge Handbook of the Learning Sciences,* New York: Cambridge University Press.

Shavelson, R. J., Phillips, D. C, Towne, L. and Feuer, M. J. (2003) 'On the Science of Education Design Studies', *Educational Researcher,* 32: 25-28.

Sigel, D. (2008) *Teaching Midrash Explicitly in the Primary School.* PhD thesis. University of London, Institute of Education.

Sigel, D. (2009) '"Was Isaac Sacrificed in the End?" Reading Midrash in Elementary School', *Journal of Jewish Education,* 75: 47-78.

Sigel, D. (2010) 'A Model for Teaching Midrash in the Primary School: Forming Understandings of Rabbinic Interpretation of Scripture', *British Journal of Religious Education,* 32: 63-76.

Silverman, K. (1983) *The Subject of Semiotics,* New York: Oxford University Press.

Sitzmann, T. (2011) 'A Meta-Analytic Examination of the Instructional Effectiveness of Computer-Based Simulation Games', *Personnel Psychology,* 64: 489-528.

Sloane, F. C. and Gorard, S. (2003) 'Exploring Modeling Aspects of Design Experiments', *Educational Researcher,* 32: 29-31.

Squire, K. and Steinkuehler, C. (2014) 'Video Games and Learning', in R. K. Sawyer (ed.) *The Cambridge Handbook of the Learning Sciences,* New York: Cambridge University Press.

Stoddard, J., Nemacheck, C. and Banks, A. (2013) 'There Is a Reason They Are Called Games: The Affordances and Constraints of iCivics Games for Democratic Education', in *GLS 9.0 Proceedings,* Madison: ETC Press.

Theriault, C. (2013) 'The Effects of Framing on Game Play Experience and Learning', in *GLS 9.0 Proceedings,* Madison: ETC Press.

Von Drehle, D. (2004) *Triangle: The Fire That Changed America,* New York: Grove Press.

Wouters, P., van Nimwegen, C, van Oostendorp, H. and van der Spek, E. D. (2013) 'A Meta-Analysis of the Cognitive and Motivational Effects of Serious Games', *Journal of Educational Psychology,* 105: 249-265.