

ACTS OF MEANING, RESOURCE DIAGRAMS, AND ESSENTIAL LEARNING BEHAVIORS: THE DESIGN EVOLUTION OF *LOST & FOUND*

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Lost & Found is a tabletop-to-mobile game series designed for teaching medieval religious legal systems. The long-term goals of the project are to change the discourse around religious laws, such as foregrounding the prosocial aspects of religious law such as collaboration, cooperation, and communal sustainability. This design case focuses on the evolution of the design of the mechanics and core systems in the first two tabletop games in the series, informed by over three and a half years' worth of design notes, playable prototypes, outside design consultations, internal design reviews, playtests, and interviews.

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INTRODUCTION

Lost & Found is a tabletop-to-mobile game series designed for teaching medieval religious legal systems. The game series has been designed in a research and design context. Specifically, a combination of playcentric design (Fullerton, 2008) and design-based research (DBRC, 2003). Details of grant support for the game series can be found in the acknowledgments section. The long-term goals of the project are to change the discourse around religious law in a positive way. There is a lack of literacy in the area of religious legal systems, and a great deal of misconception in the public. This can most easily be seen in the way in which depictions of "Sharia law" have been focused on Islamophobic ends.

"Popular narratives and a staggering array of quasi-scholarly accounts have distorted Shari'a beyond recognition, conflating its principles and practices in the past with its modern, highly politicized, reincarnations" (Hallaq, 2009, Introduction, paragraph 1). The core learning goals and design concerns are to enhance public literacy in the rather arcane fields of religious legal systems. We will expand on those goals and their evolution next.

As recommended by Smith (2010) and Howard (2011), we will ground this design case by providing both design rationale, an explication of key stakeholders, and explication of our methods, such as triangulation. Because these game designs are at the intersection of design studies and design-based research, we will point out how the different methodological umbrellas inter-relate and shift during the process. Boling (2010) points out that design cases are not design-based research. What Boling does not note is that design-based research can bring about data that can be used in design cases. Therefore, while the goal of design-cases is not social science research or theory development, such as in the learning sciences, there can be relevant interplay. For example, data gathering during design-based research can inform a design case, and design case data can inform design-based research.

In this design case, we bring to bear more than three years of design notes, versions, outside design consultations,

internal design reviews, playtests, and a limited number of IRB human subjects research studies (participant observation and semi-structured interviews). The last of these have only just begun, but have also been helpful part of the design work, especially in the development of *Lost & Found: Order in the Court—the Party Game*.

This mix of internal design review and concentration on engagement as a first priority, prior to wider IRB studies is somewhat unique. While the team consistently focused the design goals back to “essential learning behaviors,” (Plass, Homer, Kinzer, Frye, and Perlin 2011), in this design case, we are foregrounding the approaches for engagement and “meaning” and moving the bulk of IRB social science studies to later in the process. This decision is based on previous experience of Gottlieb (2015) in the combination of internal design reviews paired with design-based research, followed by extensive curriculum development. This approach is driven by a conscious decision to work towards games with a wider reach of players, and when developing the curriculum after game release. This approach is an attempt to bridge the gap between store-bought games that researchers study for how players interact with them and in groups (Squire, 2004), and studies of learners’ interactions with games designed in learning-sciences specific environments (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005).

EXPERIENCE OF THE DESIGN

Lost & Found (Gottlieb, Schreiber, and Murdoch-Kitt, 2017) and *Lost & Found: Order in the Court the Party Game* (Gottlieb and Schreiber, 2017) are published by MAGIC Spell Studios, LLC at the Rochester Institute of Technology. The MAGIC Center is both a research center and also a game studio. Both were funded by internal grants at RIT (see funding sources). The digital prototype for iOS of *Lost & Found* was funded by the National Endowment for the Humanities and was featured at the digital humanities arcade at the 50th Anniversary of the NEH.

Lost & Found (referred to in this article as “*Lost & Found*”) and *Lost & Found: Order in the Court—the Party Game* (referred to in this article as “*Order in the Court*”) are the first two games in the *Lost & Found* series. The series was intended to be modular to allow for a variety of player exploration. Beginning with Moses Maimonides’ *Mishneh Torah*, the games are intended to expand to include Islamic laws as well. The games are set in Fustat (Old Cairo) in the 12th Century, a time when Maimonides, the great legal scholar, physician, philosopher, and rabbi, was writing the law code, *Mishneh Torah* (1170-1180). Maimonides was influenced by great Islamic legal scholars such as Averroes and Al-Ghazali, and went on to influence Islamic law as well. The *Mishneh Torah* provides a distillation of centuries of Jewish law. The first post-Biblical Jewish legal code was the *Mishnah* (redacted in 250 CE). By 600 CE, the *Babylonian Talmud*, comprised of legal debates

responding to the Mishna and narrative stories, was redacted, bringing extensive legal debates about the *Mishnah* and stories together. While not a code, the *Talmud* is a central piece of both legal literature and haggadic, or story literature. By 1170, Maimonides sought to bring to the public a work that would allow for reference to how Jews could live their daily lives. Gottlieb saw in the *Mishneh Torah* a distillation of centuries of debates into a clarified, condensed code, one that could lend itself far more easily to game rules than, say, the extended legal debates of the Talmud. In addition, the locale and time would allow for future exploration of Islamic law and potential contemporaneous Christian culture in 12th Century North Africa (see Gottlieb, 2017).

Lost & Found is a strategic competitive and cooperative game in which 2-5 players work to balance the needs of their community with the needs of their family. The targeted essential learning behaviors are trade-off decisions for the players as they attempt to balance the needs of the community with the needs of family, living under the legal code of the time. Each player represents a family and role within a small community, such as Cowherd or Potter. The goal of each player is to complete at least three of their five family responsibility cards, each of which requires a large lump-sum expenditure of *dinarim* (the coin of the time and locale, and the game’s primary resource). Additionally, there are ten communal responsibility cards that can be contributed to piecemeal by each player, and the players must collectively complete at least six of those. The game lasts a limited number of turns, and if enough communal responsibilities are not completed, the community is considered to have failed, and all players lose. Otherwise, all players who completed enough of their family responsibilities win together. In this way, it is possible for no players, one player, several players, or all players to win.

On a player’s turn, they first draw some resource cards which are used to complete these responsibilities. Some resources are theirs, while others (listed on the card) might belong to another player or even an unknown stranger who is not in the game, representing the finding of a lost object that is owned by someone else. Players can use these found objects, but doing so is essentially considered theft, and can affect them negatively at the end of the game.

After drawing resources, a player then draws a card from a deck of events, each of which is designed around a particular situation addressed in the *Mishneh Torah*. Some events are helpful, such as finding money that is legally the player’s to keep. Other events give the player a choice of following the letter of the law, breaking the law for a short-term gain, or going above and beyond what the law requires at a short-term detriment in the hopes of a larger gain later. Some events are disasters or crises that all players must work together to address or risk imminent loss. If a player must ever pay resources and they cannot, they go destitute, which results in a loss of the game by *all* players (because



FIGURE 1. Final card art for a card back in *Lost & Found*. Card backs and frames for cards are drawn from period architecture from Fustat (illustrator: Annie Wong).



FIGURE 2. The cards and playmats of *Lost & Found*.

the community failed to protect their most vulnerable members).

After the event is dealt with, the player may return one lost item to its rightful owner, if they wish. This removes a card from their hand, freeing up space. Then the player may contribute their resources to a single family or communal responsibility. Family responsibilities must be paid for in full, which often requires the player to save up over several turns. Communal responsibilities may be contributed to partially, allowing players to pool their resources over time. After that, the player's turn is over, they must discard down

to their hand size limit if they have too many cards in hand, and it becomes the next player's turn. The game ends when the deck of events runs out, so players only have limited turns to complete all of their goals.

Players are given many choices throughout the game. They must balance looking after themselves and looking after their neighbors to prevent a loss by destitution. They must decide how much to work together with other players, and when to follow the law, break the law, or go above and beyond the law.

The game is balanced so that players are usually on the edge of success or failure, leading to tense situations in which an individual might choose to put more resources towards their own personal goals rather than contributing towards a communal goal. In internal playtests, we witnessed players accusing each other of being selfish (and then defending themselves with promises of using their special abilities to benefit the community in the future). We saw players struggling with completing a needed late-game goal versus keeping some resources in reserve in case a disaster suddenly required those resources or a player who was too far behind to win threatening to not contribute anything in the hopes that the rest of the players would fail along with them; in subsequent plays, our repeat playtesters tended to be much more focused on looking after any players who were getting bad draws and falling behind.

This game is targeted towards teens through undergraduate learners and takes 45 minutes to an hour to play. The initial "essential learning behaviors" (Plass, Homer, Kinzer, Frye, and Perlin 2011) targeted in the game were trade-off decision-making in legal cases involving lost and found objects, group and subgroup collaboration balanced with individual player goal pursuit, exposure (passive learning) to

historical artifacts, art, and architecture, and the taking on of roles in the community.

Order in the Court is a 3-5 player party game with essential learning behavior goals of learners demonstrating discourse/talk practice regarding legal reasoning as well as displaying curiosity about the subject matter (as indicated by requests for explanations).

In *Order in the Court*, players take turns as judge, drawing ruling cards with ambiguous descriptions of a *Mishneh Torah* ruling. The targeted essential learning behaviors are legal



FIGURE 3. Examples of *Order in the Court* ruling cards (Illustrations by Mimi Ace and Annie Wong).

reasoning, as players work to think through the implications of the laws and what may have led to their creation. The other players each have a hand of story cards that represent people, objects, and descriptions, which are also drawn directly from the *Mishneh Torah*. These players must use half of the cards in their hands to tell a story of how two people may have gotten into a disagreement that ended in “court” that ultimately led to the ruling that was read by the “judge.”

The judge then chooses their favorite story, by any criteria they wish, to win the round. Players then refill their hands of story cards, and the next player in turn order becomes the judge for the next round. After a pre-determined number of rounds of play, the winner is the player with the most judge votes. If players are curious, the actual context behind the ruling is given on the back of the ruling card. While *Lost & Found* is primarily a game of trade off decisions, resource management, and collaboration, *Order in the Court* is a game about performance, humor, and improvisational storytelling.

Order in the Court is also targeted to teens and undergraduate learners, but likely will be accessible to pre-teens as well. It is in the early stages of public testing.

TIMELINE AND TEAM BUILDING

The *Lost & Found* project intertwines two sets of design goals. First, to design games that are fun for the players. By fun, here we refer to engrossing games, in Erving Goffman’s (1961) sense, as we are aware that “fun” does not necessarily mean “joyful,” rather that intense concentration and engagement in games can often be a form of *engrossment*. Second, the games have to be platforms for learning in informal, and ideally also formal, learning environments. This means

they have to have depth of content to allow curriculum to be built around them, and they should provide a variety of possible interactions and opportunities for reflection in the learning environment, guided by educators. These games require accuracy with regards to rendering the educational material, in this case, historical, religious, and legal material. The team for the games is over thirty faculty and students thus far, ranging from illustrators to sound designers (for the digital mobile prototype of *Lost & Found*) to PhDs in Jewish and Islamic Law, religion and games, and a scholar specializing in games for the public and escape rooms.

We often had numerous student designers working alongside faculty. A typical design session would be led by faculty member Owen Gottlieb and by Winter of 2015, both Gottlieb and Ian Schreiber. Faculty would posit design problems and discuss possible solutions with student designers. The team would

evaluate ideas and test them through iterative prototypes, all the while digging deeper into the historical texts and searching for possible pathways to create a game system that we had yet to see - one that could model competition and cooperation, and allow for any or all to win. Often, in the first year, design sessions were paired with playing tabletop games together that might provide windows into relevant game mechanics, such as voting systems, tracks, varying modes of partial cooperation. Aspects of these design and discussion sessions are referenced later in this article.

In order to understand the different stages of design and the kinds of participation of team members, team growth, and the longitudinal nature of the designs, next is a chronology of major shifts in team and game development. With each year at RIT, new undergraduate and graduate students joined the design team, each making contributions to the design. Note: complete credits of the team appear in the game credits and are posted on the game website (www.lostandfoundthegame.com).

2011-2014 Origins: Early Design Ideation and Prototyping at ConverJent

Gottlieb developed the initial concepts for *Lost & Found* in 2011 at ConverJent, Jewish Games for Learning, an organization he founded in 2010 at the National Jewish Center for Learning and Leadership (CLAL). While working on his Ph.D., he recognized a connection between games as rule-based systems and Jewish legal codes as rule-based systems. He saw an opportunity to design a game system that could generate live cases based on the law. Perhaps a game could allow for the teaching of Jewish law in a way that was more

experiential, tactile, and could free the law from pages of the written text (Gottlieb, 2015). Gottlieb noted the circulation of resources and varying types of cooperation in addition to competition in popular tabletop hobby games at the time, such as *Settlers of Catan* (Teuber, 1995), *Pandemic* (Leacock, 2008), *Agricola* (Rosenberg, 2007), and *7 Wonders* (Bauza, 2010), many of which have mobile versions as well. He began experimenting with the Biblical injunctions around lost and found objects (Deuteronomy 22:1-3) and how they were understood in the *Mishnah* (redacted circa 250CE), the first post-biblical code of law.

Years earlier, while Gottlieb was in rabbinical school, Shoshana Jedwab had introduced Gottlieb to the book *Bet Din: The Jewish People's Court, Student Casebook* (Grishaver, 1986). This work set up a kind of mock court in which students could begin to access codes through cases in the law. Gottlieb saw the potential in shifting from mock cases to instantiated cases within games. A game could bring to life live cases as players took roles and were faced with events. As the Talmud raises many hypotheticals around a debate or case, a variety of hypotheticals regarding a law could be raised through the natural progression of group play, as players with various motivations interacted.

Gottlieb then turned to the treatment of lost and found objects in *Mishneh Torah* by Moses Maimonides in the book of *Nezekim* (damages, as in torts), and the chapter *Gezelah va'Avedah* (laws regarding robbery and returning lost objects). Maimonides wrote *Mishneh Torah* in Fustat (Old Cairo) from 1170-1180. Maimonides was and remains to this day a highly influential philosopher, legal scholar, rabbi, and physician. His legal works were influenced by Islamic scholars and likewise influenced Islamic scholars. In order to begin to formulate possible rule systems for a game, Gottlieb needed a set of Jewish laws that, like the Mishnah, were terse and condensed, but that also held understanding of a broader history of the debates and discussions surrounding the laws. In his fourteen-volume *Mishneh Torah*, Maimonides condensed sprawling debates about the Mishnaic law that are contained in the *Talmud* (the *Babylonian Talmud* was redacted circa 650 CE). *Mishneh Torah* was, in part, an attempt to provide clarity of laws such that a person could determine how to conduct day to day life—a condensation of sorts. In addition, by setting a game in 12th century Egypt, Gottlieb felt he could explore the interplay between Jewish philosophers and legal scholars and nearly contemporaneous scholars and philosophers of Islamic law, as well as potentially explore the contemporaneous local Christian communities. This would allow for a natural modularity of the game and broader audiences. He could then also begin



FIGURE 4. Core game design team playtesting an early version of *Lost & Found* (Photo by Owen Gottlieb).

explore the interplay of Jewish and Islamic law systems. Daniel Fleigel was interning with Gottlieb at ConverJent and in 2014, wrote up the first paper prototype of *Lost & Found*. While the prototype was not yet “playable,” it was the first instantiation of the game in which the growing team had instantiated laws, resources, and characters drawn from the text.

Fall 2014, RIT

In August of 2014, Gottlieb joined the faculty of RIT and began working with a graduate research assistant, Lakshminarayanan Vijayaraghavan, on the development of *Lost & Found*. Soon, a variety of additional graduate students joined the project, working on game design. The team delved into the *Mishneh Torah* text, determining meanings, working to understand various legal concepts, and how they might be instantiated in a Eurogame-style system that could model cases so that learners would have to navigate legal cases.

Winter 2014 / Spring of 2015

As the initial model developed, a number of faculty and students from RIT and other universities began to join the team. Ian Schreiber came aboard and would eventually take the position of core mechanics designer, leading the team in weekly and sometimes twice a week iterations of playable prototypes and playtests, as Gottlieb worked in ludo-legal design, concentrating on the meanings and ramifications of the laws. Phillip Ackerman Lieberman at Vanderbilt, a scholar of Jewish and Islamic law in medieval North Africa, began to consult the team on period accuracy and interpretation of particularly challenging passages in the law.



FIGURE 5. Graphic Design & Illustration, Development, and Sound Design (for digital prototype) team members at one of the many team meetings (Photo by Owen Gottlieb).

Kelly Murdoch-Kitt, graphic design faculty at RIT (now at the University of Michigan), brought on three undergraduate student illustrators. More graduate and undergraduate students joined the team in a variety of roles ranging from sound design on the digital prototype to knowledge management as the team's digital archive grew and expanded.

Faculty from other Universities, including Harvard, Ithaca, Nazareth, and Wilfred Laurier joined as well, bringing with them subject matter expertise in Islam, of comparative religion and media, games in libraries, and the responsible teaching of comparative religion in public schools.

Fall 2015

At the end of the fall term, the team locked core game mechanics of *Lost & Found* in preparation for developing the digital prototype. They also began working on preparation to release *Lost & Found* to the public through a print on demand service. A number of undergraduates joined the game design team, illustration and card user interface, and card production teams, as well as design for an early pre-prototype animation in anticipation of the mobile version of *Lost & Found*. By the end of the term, the team received a grant from the National Endowment for the Humanities towards building a digital mobile prototype of the game.

Winter-Spring 2016

In January of 2016, the team split into two design tracks. One track, funded by the NEH, would build out the digital prototype of the December 2015 locked version of *Lost & Found*. A second group, funded by internal grants from GCCIS RIT

and MAGIC, returned to the drawing board to explore other mechanics for a potential new module or second game. A number of new graduate students joined the team, while some team members graduated.

Summer 2016

Full production took place on the digital mobile prototype of *Lost & Found* for the National Endowment for the Humanities

Fall 2016

Gottlieb and RIT faculty member David Simkins, with graduate student Shashwat Sinha, conducted IRB studies on learning various versions of *Lost & Found* with teens. They studied learners playing the 2015 tabletop version of the game, the iPhone version of the game, and in the last session of field play, a variant of the game with new mechanics - what would eventually become *Order in the Court*. The team delivered the digital prototype to the National Endowment for the Humanities. In November of 2016, the digital prototype of *Lost & Found* was featured in the Humanities Arcade at the 50th Anniversary of the National Endowment for the Humanities at the University of Virginia. The team continued to expand.

Winter/Spring 2016

Working on the remaining internal grant, the team completed production on *Order in the Court*, ensured that *Lost & Found* was ready to print for public sale, and ten team members graduated in the Spring as new students joined.

Summer 2016

MAGIC Spell studios formally picked up the two titles for sale and distribution.

Fall 2017

Lost & Found and *Lost & Found: Order in the Court - the Party Game* are released for sale through MAGIC Spell Studios using The Game Crafter platform.

Summer 2018

By the summer of 2018, the series was gaining acclaim, featured in the Smithsonian SAAM Arcade, and accepted to a number of venues, including the Boston Festival of Independent Games.

Fall 2019

In the Fall of 2019, *Order in the Court* was nominated for Tabletop Spotlight at Indiecade and was featured at Open World Arcade at the Akron Art Museum.

DESIGN PROCESS

Given the scope of this project and a team of over thirty students and faculty, we could present design cases ranging from game design to graphic and UI/UX design to sound design (for the mobile prototype) to design for print and even mobile. This design case concentrates on the game mechanics and game design systems specifically. This is to give a particularly in-depth look at how the game design evolved. Given the focus here, we do not, for example, delve into the specifics of the interactions between illustrators and historians who worked to create authentic images for 12th-century Fustat (Old Cairo). The focus is squarely on systems related to objectives, fidelity vs. play time, and a short section on game balance.

As noted earlier, *Lost & Found* had the dual design goals of making an engaging experience and crafting a model of a particular religious legal system that could be learned and understood primarily through play. Throughout the design process, these two goals would push and pull at each other, leading to an ongoing cycle of streamlining the mechanics to make the game more manageable to play (which in turn abstracted away from the subject material that the players were supposed to be learning), then adding mechanics and complexity to the game to improve the fidelity of the simulation (which then made the game more cumbersome and less fun to play). The team had to navigate these tensions throughout the process. Additionally, the team struggled through much of development with the player objectives: in the context of operating within a legal system, what does it mean to “win?” A third element of the game that underwent many revisions involved randomized events which were taken from the source material—the *Mishneh Torah*—we backwards engineered events from laws by turning to the specific situations the laws presented. We examine each of these in turn.

The Event Deck

From the beginning, *Lost & Found* had a concept of random event cards. These cards were based on actual situations described in the *Mishneh Torah*. For example, one of the laws refers to the responsibility of a bystander if they have a vessel filled with wine, and they notice someone nearby carrying a vessel with more valuable honey. The honey vessel cracks,



FIGURE 6. Example of an event card in *Lost & Found* that causes a negative effect with no choice given to the player. This is one of the few such cards that remained in the final version of the game (illustration by Tori Bonagura and Annie Wong).

causing the honey to be in danger of spilling out onto the ground, rendering it worthless. The law details the conditions under which the owner of the wine may choose to pour out the wine in order to have an available vessel to save the honey and the compensation due to them from the owner of the honey. This became a card in the game, “Honey Jug Cracks,” which then necessitated the existence of vessels, wine, and honey as resources in the game.

In the Spring 2015 semester, a series of playtests concluded that there was not enough agency in the events. For every “Honey Jug Cracks” card that gave the active player a choice, there were several cards that merely caused a player to find or lose an object with no further interaction. The design team revised the deck to increase the proportion of cards that either involved choices directly on the card (mostly, whether to follow the law, go above and beyond the law, or break the law), or else to give the players additional choices indirectly (such as providing additional resources that they could choose how to utilize). The Honey Jug card would involve negotiation, as is suggested by the law.

By the end of Fall 2015, as the core mechanics were solidifying, playtesters again identified the event cards as problematic. At the time, the game was very challenging to win, and the events were mostly negative, creating obstacles and difficulties that the players had to overcome. According to our playtest notes, players reported feeling like they were constantly dealing with punishment signals sent from the event deck. As there were few positive reinforcement signals to counterbalance this, the event deck became a sense of frustration more than of anticipation or excitement.

To address this issue, the design team revised the event deck, increasing the number of helpful effects so that the deck was more balanced between positive and negative events. This led to a new issue where the game experience could swing wildly: sometimes players would get many positive events at the start of the game and win the game early, while other times, the deck would deal multiple Crises and Disasters in the first round and the players would lose immediately. The design team addressed this by dividing the events into four “seasons” in which each season’s cards were shuffled together during setup, and the players would then play each season in order. In addition to giving the designers more control over the play experience, this also gave us the opportunity to make the game friendlier to new players. The design team put simpler events in the first season to prevent new players from becoming overwhelmed with complex mechanics. The team also built a progression of increasing difficulty into the game, in which the earlier seasons contained more helpful events while the later seasons had the looming threat of more dangerous negative events.

In Search of an Objective

In the earliest versions of the game from 2014, there was no explicit victory condition. While many resource-management Eurogames might simply make wealth or resources the victory condition—richest player wins—the design team felt this was an inappropriate message for a game about social responsibility. Certainly, the ability to manage resources and create wealth should be rewarded, but what a player does with that wealth is more important. We initially envisioned a sliding scale, in which a combination of a player’s wealth and their reputation among their fellow players would combine to form a single score.

One of our other considerations from the beginning was the concept of a transgressive win: a player who behaved selfishly, broke the law, went against their community, and still managed to win. While the design team did not want this to be trivial or even the primary form of victory, we did want this to be a possibility. Otherwise, players would not see transgressive acts as a viable option, and the choice to break or follow the law would become a non-decision.

Just before the start of the Spring 2015 semester, Gottlieb had a consultation with friend Cameron Matheson to discuss the state of the game, which led to experimentation with a new voting system between players and also NPCs. We defined player reputation as a critical resource, and we noted that there are two types of reputation: the reputation of a player among their fellow human players, and reputation within the greater community (among “NPCs” that did not formerly exist in the game but would later be added). Matheson also suggested that it should generally cost players to do the “right” thing, so that following the law was again not a mandatory decision.

Gottlieb and Matheson also experimented with whether the driving goal of the game should be whether the community as a whole survives. This led to the design team, in the Spring 2015 semester, deciding that the objective should support all possible win conditions: all players might lose, all players could win, some subset of players could win together, or an individual could win alone (this last result was seen as the equivalent of the aforementioned transgressive victory).

As the design team struggled with what it meant conceptually to “win” or “succeed” in the context of the game’s setting, graduate student Alex Lobl wrote a white paper for the design team that referred to “Acts of Meaning”, which was developed further by another graduate student, Bruno Rocha into the idea of “responsibilities” and eventually became the Family Responsibilities in the final game. Gottlieb drew these responsibilities from the *Talmud* and later *Mishneh Torah* variations by Maimonides: a list of responsibilities that every parent was expected to fulfill for their children (such as teaching them a trade and seeing them married). These would provide the individual goals. For the collaborative goals, Gottlieb drew from the same sources a list of elements that a town required to merit a Torah scholar living in their midst. Players could complete these collaborative goals (termed Communal Responsibilities in the game) to give bonuses to everyone, though at the time, they were optional.

This led to a challenging situation in which one player might complete their own Family Responsibilities early in the game, thus having effectively won despite the game being still in progress. Such a player had no incentive (or disincentive) to help other players; as one player said in a particularly heated playtest at the beginning of the Fall 2015 semester, “I got mine.” Another challenge, identified earlier by Matheson and an ongoing issue, was that players who fell behind had difficulty catching up due to the positive-feedback nature of the mechanics (players who had plenty of resources could buy additional resource generators or complete responsibilities that gave them further bonuses, giving them even more resources on subsequent turns).

The design team found an elegant solution to both of these issues: the introduction of Crisis and Disaster events to the existing random-event deck. These required players to collectively or individually spend a large sum of resources, and failure to do so could lead to a total loss. Any player who felt they were too far behind and sure to lose could then play to bring everyone else down with them, which then gave the players who were ahead an incentive to help those who were behind. The design team added the ability for players to trade freely during certain events in the game, allowing players to ask for help from their neighbors, and some other events were changed to help players who were trailing or hurt players who were ahead. Lastly, we made the Communal Responsibilities mandatory: players must

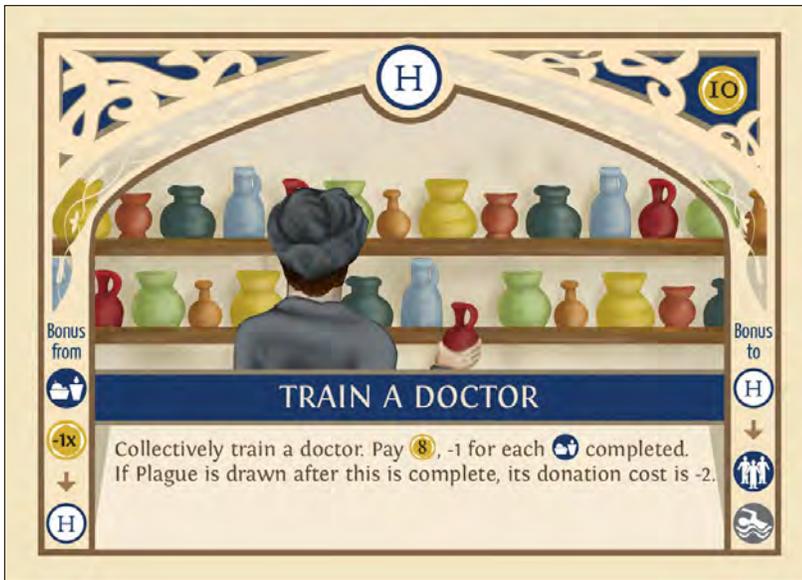


FIGURE 7. Example of a Communal Responsibility in *Lost & Found* that the players must complete together (Illustrations by Mimi Ace and Annie Wong).

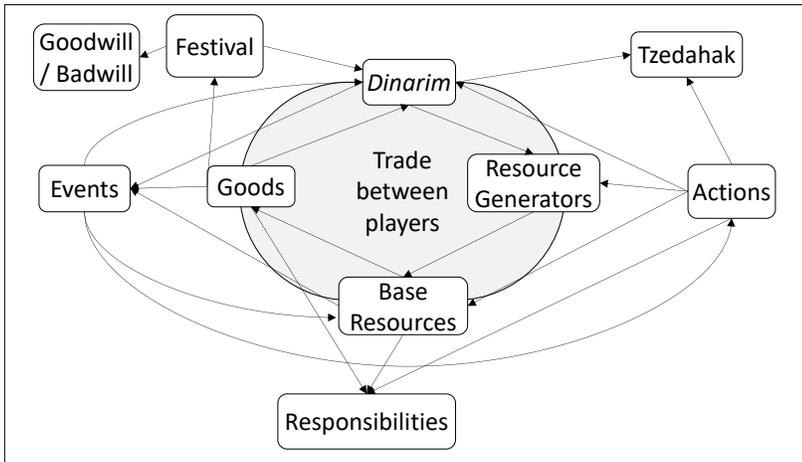


FIGURE 8. Resource diagram representing *Lost & Found* at the height of its mechanical complexity.

collectively complete a certain number of them by the end of the game, or else everyone loses. This gave wealthy players something extra to do with their excess money (become big contributors to the community in order to avoid a total loss, while also earning goodwill from their fellow players as the communal cards give bonuses that assist everyone).

The design team also modified resource generation. Previously, players generated a set amount of resources per turn; this became a random draw from a resource deck. This was the subject of much design discussion regarding luck in the game, and whether it is fair for a player to get a “good” or “bad” resource draw. On the one hand, being resource-starved due to a bad draw is no fun, leads to reduced feelings of player agency, and could feel frustrating if a player perceived their loss as due to no fault of their own (or if they

won, that it was only due to them being at the mercy of accepting charity from their fellow players). On the other hand, the team felt this was an accurate model for the real world, and that part of the skill of the game was playing with the hand one is dealt and using your skills of persuasion and strategy to contribute to the community and convince the other players that it’s in their interest to help you.

Tradeoffs Between Elegance and Simulation Fidelity

From the earliest playable versions, *Lost & Found* was impractical in terms of play time. By the start of Spring 2015, more than a year into the project, the game was slated to last 15 game turns, with each turn taking about 45 minutes in internal playtests. This led to a total play time of over 11 hours, had the game been played to completion—which it never was, because the team would only play through the first couple of turns.

The design team recognized this as an issue very early on, but initially focused on finding core mechanics that met the design goals of fun/engaging and with learning content and mechanics that triggered essential learning behaviors (trade-off decisions regarding the law), on the theory that any change to the fundamental gameplay might fix the problem incidentally. By Spring 2015, the design team realized that this was unlikely to happen without more direct intervention, and so began to seek ways to streamline play to bring the time down to something manageable that could reasonably be played in a single class period.

The design team started by simplifying the resource structure. In earlier revisions, the game featured as many as a dozen types of resources, as well as resource production and crafting mechanics (for example, players might own cows that could produce milk, which in turn could be processed into cheese). Relating each resource to the others was unwieldy, so the team instead removed the crafting mechanics entirely, and reduced the resource types to the single resource of *dinarim* (currency referred to in the *Mishneh Torah*) and put all other resources in terms of their *dinarim* cost. This allowed all items to have a direct numeric relationship to all other items.

The team experienced a major breakthrough in one key design meeting at the start of Fall 2015, where Schreiber led a design meeting for the purpose of diagramming the major mechanics, systems, and resource flow throughout the game. The team looked at the relationships between each

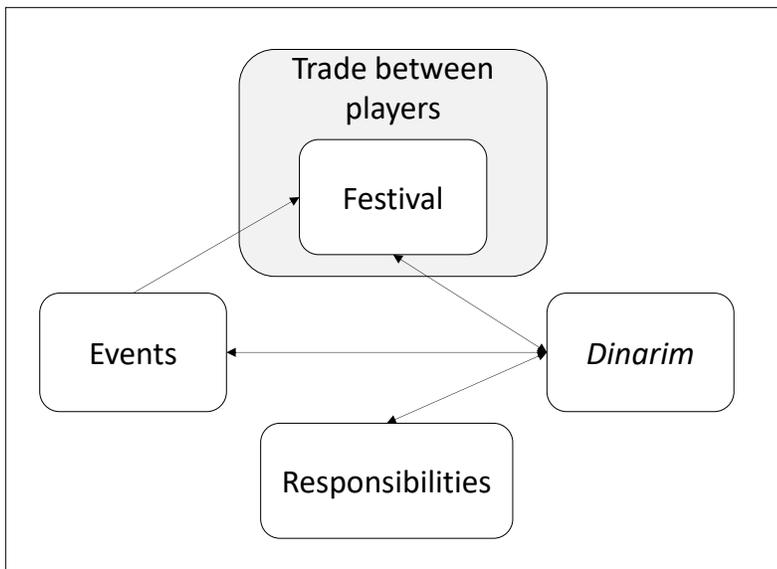


FIGURE 9. Streamlined resource diagram for *Lost & Found* after eliminating extraneous mechanics and systems.

mechanic, drawing arrows to link similar concepts. What we found was that there was one core game loop involving resource generation: players used resource generators to create base resources, convert those to high-quality goods, and then either sell those goods for more money to buy more resource generators or else use those goods to fulfill family responsibilities or reduce the effects of adverse events.

Events interacted with nearly everything due to their variety, and thus gave them a place as the central mechanic that drove the game forward. Meanwhile, there were other elements such as Tzedakah (literally “justice” in Hebrew, a charity mechanic where players could donate or receive resources according to their needs) and Goodwill/Badwill (where players could give a token to indicate their fellow players were or were not contributing to the common good) which were peripheral to the core game loop. The team determined that for the purposes of streamlining play, these peripheral mechanics could be safely removed without modifying the core loop. The end result was a much smaller diagram with a dense network of connections between the remaining mechanics. Upon making the relevant changes and playtesting with the design team, we were able to complete a playthrough of the game for the first time, and it took a mere 90 minutes. Further refinement eventually got the play time down to between 45 and 60 minutes.

Throughout development, the design team found that at times the game was *too* simplified and abstracted, and that it was drifting from its learning design goals—anchoring the centrality of trade-off decisions in the face of the law. At one such time, in the Fall 2015 semester, the design team added Communal Responsibilities to the game, and later made them a victory condition, as noted earlier. Initially, each of the ten Communal Responsibilities gave a separate bonus.

This added variety to the game while linking the mechanics to the themes depicted on these responsibility cards, but it was also hard to read, challenging to remember all of the active effects in play, and generally made the game state feel too complex.

The designers revised the Communal Responsibilities to give simple cost reductions to Family Responsibilities and Disaster cards and also implemented a chained bonus system where each Communal Responsibility gave discounts to other Communal Responsibilities as well. This led to a critical trade-off decision among players of whether to prioritize family or community: players who complete their Family Responsibilities first gain bonuses that help them for a longer direction, which they could then use to assist the community more in late game. On the other hand, if players collectively agree to aggressively complete Communal Responsibilities

quickly, that would reduce the cost of everyone’s Family Responsibilities, which is more resource-efficient... but also would require players to trust one another and to have faith that they can take care of their own families by the time the game ends. This was a situation where simplifying the mechanics led to more interesting choices for the players that aligned with the learning goals of the game (specifically, understanding the trade-off decisions in the context of the tension between the laws protecting individuals and the laws protecting the common good).

Balance Process and Challenges: Under the Hood

Two other situations arose during the design of *Lost & Found* that deserve brief mention: the process of printing and the process of balancing the game.

In the earliest versions of the game, each revision consisted of two files: an Excel sheet that contained a complete card list, as well as separate worksheets that took the card data and formatted it for printing. For the purpose of printing cards that were functional and had all of the required text and numbers on them, this was fine. However, once we looked towards printing a final version (towards the end of Fall 2015), the team needed to address the user interface and text layout of the cards, that required more precise formatting than Excel would allow. Design shifted then to creating the printable cards in PowerPoint, where designers could easily play around with the positioning of text and symbols on cards. This was helpful, but also added an extra time burden, as data now existed in two places (Excel and PowerPoint) which meant that all updates to the game had to be made twice, and if the two ever got out of sync with each other we needed to figure out which was the correct

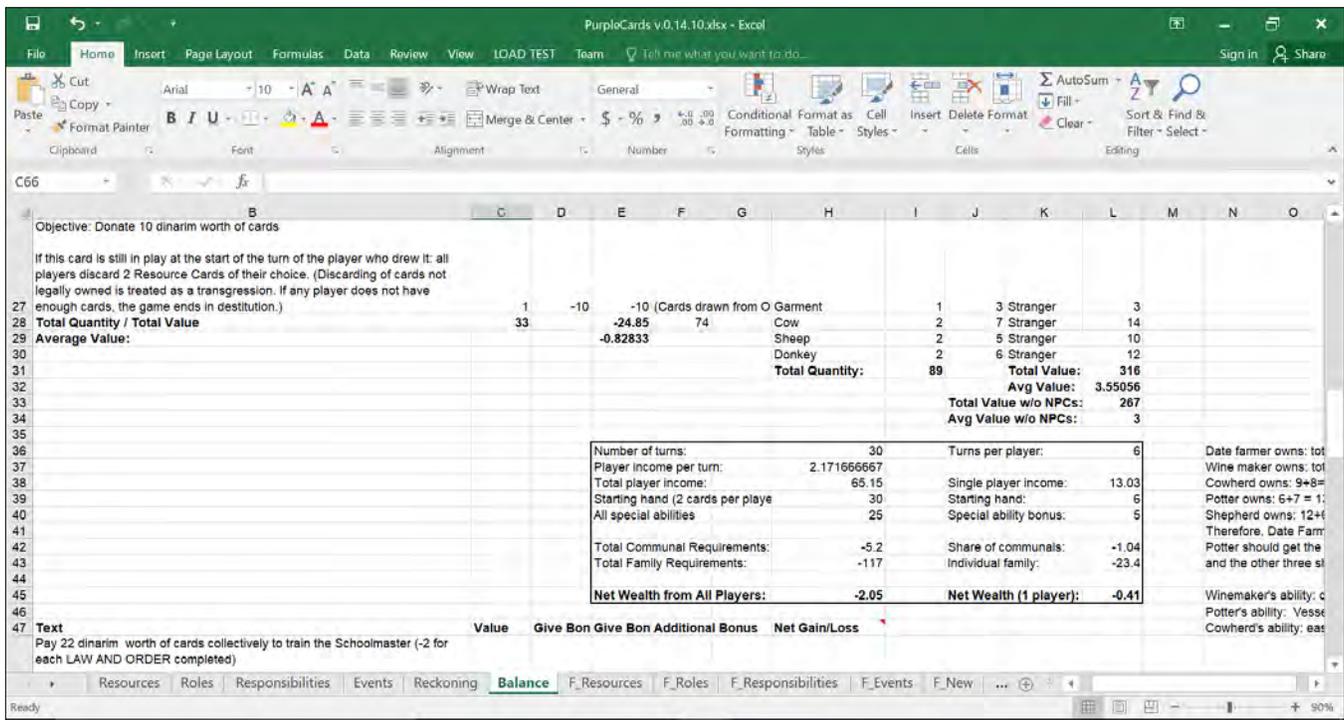


FIGURE 10. Balance tab of the card spreadsheet.

value. There was no way to export data directly from Excel at the time, so this was an entirely manual process.

At this point, the complete rule sheet used for playtests was approximately ten pages, which could be cumbersome for playtests where the testers read through the rules independently. Schreiber proposed the idea of a one-page “demo sheet” as a way to streamline the playtest process and get testers playing quickly by only explaining the mechanics that would be encountered in the first turn or two, and leaving additional mechanics for later. Such a document would also have the benefit of making the game easier to show and introduce at game conventions and festivals. This was a helpful aid, but as with the PowerPoint, the team now needed to keep *two* rule sheets updated whenever changes occurred, which meant a greater time burden for documentation.

Also, around this time, Schreiber created a new tab in the Excel spreadsheet to mathematically analyze the resource flow of the game, using data from the cards directly. Essentially, this was a matter of calculating the average number of *dinarim* each player would gain per turn (accounting for both the random resource draw and the event card), plus the value of their special ability, and comparing that total income to the resource requirements to complete their Family Responsibilities and their share of the Communal Responsibilities.

This was useful in tuning the game’s difficulty by narrowing or widening the margin between total resources received

by the players, and total resources required by the players in order to complete the requisite responsibility cards to win.

One of the issues quickly discovered when balancing was the difference between playing with all new players, compared to playtesting internally within our team where everyone was familiar with the card decks. Players who know the contents of the decks can plan ahead for events that they know are coming, and know the math of what to expect (on average) from a random draw of the resource deck. However, our primary use case for this game was to have it played in a classroom or community center once, with players who have not played it before. Thus, familiarity with the specifics of the game was not a given. For this reason, the design team made the game slightly more forgiving than it might have otherwise, giving players a few more resources (on average) than they would need to complete the game.

From Trade-Office Decisions to Legal Reasoning

In Fall 2016, the design team had another design breakthrough when Scott Nicholson challenged our fundamental assumptions: why did this have to be a resource-management game in the style of Eurogames? Why not something closer to a tabletop role-playing game, if the goal is to get players discussing meaning? This was not practical with the original game, which was designed as a tabletop-to-mobile project with a digital component—a game that was fundamentally about discussion and debate would be a poor fit for a mobile game played solo or through the internet. We were, however, able to spin off a second project to explore this

possibility as an entirely separate game in the same setting and with the same fundamental design goals.

The team experimented with some pre-built scenarios that had extremely light resource management and a set of situations players would encounter. Each player had their health and *dinarim*. In each vignette, players were given one of several options. For example, on the way to market they might encounter a neighbor's animal that wasn't tied down and was escaping its enclosure, and they could either ignore it (and save their action for selling their goods at market) or secure the animal (which required a majority of players to choose this, even if the others did something else). Later on, they might meet the neighbor who will react depending on the choice that each of them made. The goal was simply to survive all of the scenarios without running out of money or health.

A key moment for the design team occurred during and after a small-scale IRB study with teen players run by Gottlieb and David Simkins. Simkins noted in his discourse analysis that the kinds of topics the players were focused on were task completion, as opposed to reflective questions such as the meaning or purpose of the laws. That kind of discourse could come out of facilitation of the game, but was not present during the discussions of collaborative resource management.

We returned to the essential learning behaviors—to have players collaboratively and competitively solve trade-off decisions in response to the laws. We dug further, using talk practice as a guide, asking what kinds of articulations we might hear when learners demonstrated an understanding of and appreciation for the laws in their particular time and place. What we did not see in the IRB study (without explicit facilitation) was a deeper discussion of *why* the laws were the way they were. In one design meeting, the design team wrote down a number of phrases that they wanted players to be saying (reproducing discourse types) and used that instead as the basis for our design, i.e., designing for desired player talk practice that could demonstrate articulation of legal reasoning or the value of the laws.

From there, we created a new prototype in which players would be tasked with having conversations about the law as the core mechanic. We would present a case to them, and they would each form arguments for how to resolve the

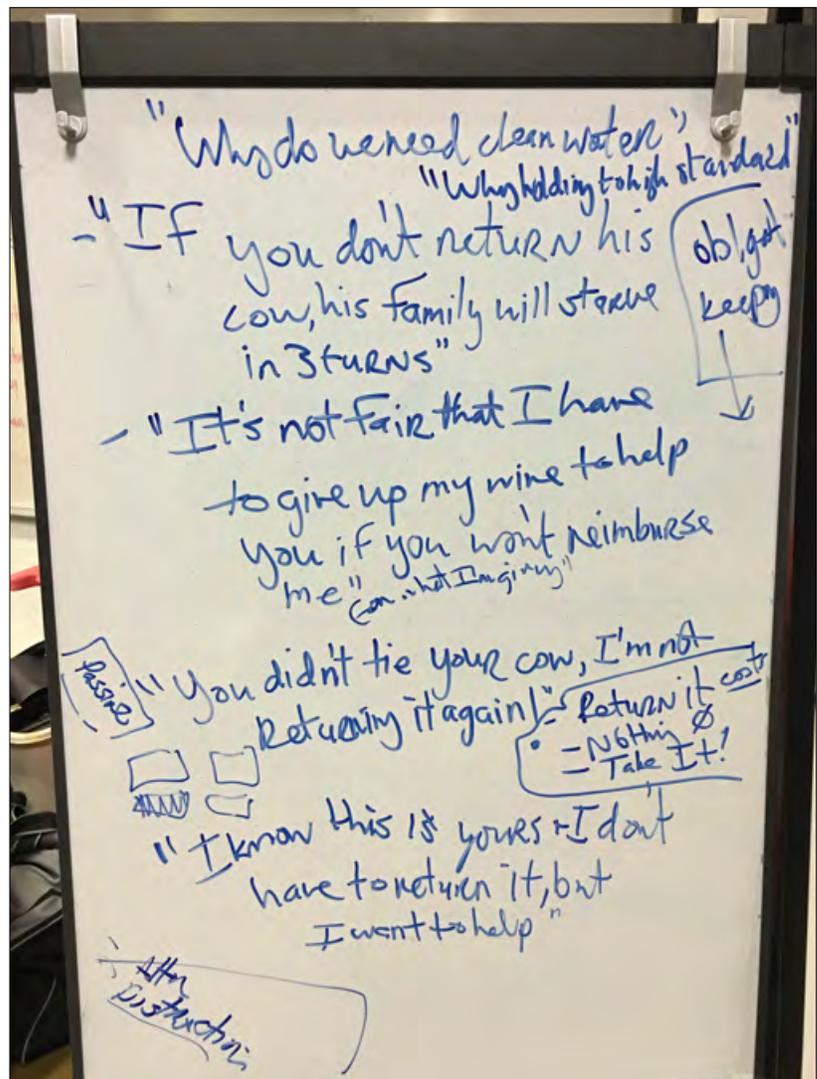


FIGURE 11. Selection of kinds of phrases that the *Order in the Court* design team hoped players would say during play (a method of focusing design around kinds of potential talk-practice with embedded essential learning behaviors).

case. One player would sit out each round, similar to party games such as *Apples to Apples* (Kirby and Osterhaus, 1999) and *Cards Against Humanity* (Dillon et al., 2011) and choose which other player was subjectively the best at making their case. We also tried a version in which there was no player sitting out, but the "correct" answer was given, and players would collectively agree who was closest to the actual ruling or rationale behind a law.

What we found in design review and playtesting (non-Human-Subjects testing) this new version was that players were interested in examining these laws, but a contemporary audience of game players is generally unfamiliar with religious legal systems from more than 800 years ago. If players went into the game without any prior knowledge or training, trying to say what the laws were (or why) was very much a guessing game in which the players had no rational basis on

which to make their arguments. On the other hand, if players were given the information up front, they would have the answers and the game became trivial.

The design team was able to resolve this issue by shifting the focus from getting the “right” answer to being entertaining. Instead of making a case for a law, we had the players approach it backwards: they are given a ruling from a court case, and have to construct the backstory for how that case got to court in the first place (who had a disagreement, and why?) in such a way that the given ruling would be the just outcome. At first, we tried a two-tiered scoring system, with players earning points for giving the most entertaining answer and also for giving the answer that most closely matches the actual ruling. This method was an improvement, but players felt they had to choose one or the other (accuracy or humor) and could rarely find a way to do both with intent.

The design team tried removing the accuracy scoring so that players were only judged by whatever the preferred criteria were for the player sitting out and judging the answers in any given round. What we found in playtests was that players expressed much more fun (most often marked by laughter) and also, on their own, began asking for the actual explanation from the period—a marker of curiosity in the material from a playtest perspective. We decided to include this information on the back of the card so that those curious could look it up, but giving no requirement in the rules that it be read in any way. This put the learning in the hands of the players.

We also found that constructing a story with nothing but the ending is a skill that not everyone possesses. Some players took to it naturally, while other testers struggled. Additionally, we found that some tests involved several players constructing highly similar stories to one another. To address both of these issues, we added cards to represent People (potter, doctor, etc.), Objects (*dinarim*, jar of honey, etc.), and Modifiers (has a distinctive mark, was neglectfully abandoned, etc.), which we affectionately acronymized as MOP cards. Players had a hand of these cards and constructed their stories using a subset of their hand. This gave players some scaffolding as a starting point to construct their story while giving each player a different hand to force their stories to remain distinct.

We tried other types of cards, such as verbs, environments, and weather (based on the art that we had from *Lost & Found* that could be repurposed, or from the concepts mentioned in the relevant sections of the *Mishneh Torah*) but found that



FIGURE 12. Selection of cards from *Lost & Found*.

these tended to be too specific: most cases don’t involve inclement weather, so those cards end up being extraneous, and the few times a case does involve this, the card fits a little too perfectly through the luck of the draw. We also tried keeping the MOP cards each in their own piles to guarantee that players would have an equal number of each, but ultimately found through playtests that having them all shuffled into a single common deck was simpler and led to faster setup (which is a consideration for a light party game) and didn’t negatively impact the players’ abilities to tell stories, even if they received an unbalanced hand.

It was in early Spring 2017 when the mechanics of *Order in the Court* were finalized, and the design team shifted to content. At this point, it was established that we were creating a party game with a focus on having players emergently create humorous stories, and we focused on the humor value of the cards. Each week, we tested a set of legal case/ruling cards and a set of MOP cards and recorded which ones led to players laughing and which ones did not. Later, we added a mechanic to allow players to discard MOP cards they weren’t using, and we recorded which cards players voluntarily discarded, on the theory that they found those uninteresting or too hard to use. Any case/ruling cards that were not sufficiently funny were either revised or removed from the game, and likewise for MOP cards that got consistently discarded. To assist in the humor value of the MOP cards, the design team wrote flavor text for each card. For cards that involved concepts unfamiliar to a contemporary audience (such as a vintner, which is a person whose trade is making wine), the flavor text was used to explain. For other cards where the meaning was clear, the flavor text was written purely for humor value.

CONCLUSION

We hope that these thick descriptions of our design processes will be helpful to those approaching games in the humanities that work to model complex systems - such as community interactions with and understanding of historical religious laws.

Both *Lost & Found* and *Order in the Court* are currently for sale through MAGIC Spell Studios via The Game Crafter website. As of this writing, the team is working on the Islamic law module for *Lost & Found* and planning ahead for intensive curriculum development with educators using the games. The team is also continuing the human subjects research.

ACKNOWLEDGMENTS

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