

**Prototype Gamer:  
Effects of Digital Prototyping Tools on the Attitudes  
and Behaviors of Tabletop Game Designers**

A Thesis

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## ABSTRACT

### Effects of Digital Collaborative Tools on the Playtesting Behaviors of Tabletop Game Designers

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The purpose of this thesis is first to conceptualize a digital toolset to facilitate cooperation among board game designers in the process of game development and playtesting, and second, to observe the use of such a toolset and to evaluate whether it is suitable for further development. To carry out my investigation I evaluated existing software and based on my experience as a board game designer and organizer of a board game meetup group I designed a toolset that I believe could assist in the enterprise. I then play-tested the toolset during a six-week testing period involving 13 tabletop game designers recruited from tabletop game design “Meetup” groups on Meetup.com. Three virtual play-testing meetings were held to allow these study participants to play-test each other’s games using a toolset consisting of the commercially available *Tabletop Simulator*, a companion application, *Card Creator*, and website, *prototypegamer.com*, the last two of which I built to complete the set. The test group was comprised of members of various U.S. tabletop gaming communities found on Meetup.com. The theoretical framework for the design of the thesis project is informed by the writings of Pierre Levy, Beth Coleman’s concept of *X-Reality*, and Clay Shirky’s *cognitive surplus*. Data collected included pre-study and post-study questionnaires and online behavioral observations of the participants during the testing session. Results indicate the use of *Tabletop Simulator* in conjunction with *Card Creator* and *prototypegamer.com* encouraged participants to consider incorporating digital prototyping and play-testing tools when designing future tabletop games.



## Chapter 1: INTRODUCTION

### 1.1. Informing this thesis – a very particular set of experiences.

This Master's Thesis Project was informed by my particular set of experiences in the world of tabletop game design. Although my time as a graduate student at Drexel University began in the spring of 2014, the experience that initially inspired the design of this research began in the fall of 2011. I was an exchange student in Berlin, Germany with a burgeoning interest in board game design, and decided the best way to thwart my isolation in a foreign land was to seek out like-minded individuals who shared my passion.

Through web-searches and generally exploring the neighborhoods of Berlin, I discovered Spielwiese, a board game café which still exists and thrives today. In Spielwiese, I found a group of people who shared my passion for tabletop gaming. The majority were German-born residents of Berlin, however a significant amount were English-speaking “Ausländer” like me. Inspired by the group, and in an attempt to expand it, I founded the Ultimate Berlin Intercultural Board Game Experience (UBIBE) in late 2011 on Meetup.com. The purpose of the group was to *play* rather than *design* board games.

Although I left Berlin in 2012, I am happy to say that the group continues to thrive at the time of this writing and has hit the milestones of over 1000 meetups and over 1400 members. I spent the year after Berlin in Boston, MA, where I became a peripheral member of the Game Makers Guild, a meetup group in Cambridge dedicated to tabletop game *design*. Eventually, I pursued a board game design internship at Fantasy Flight Games during the last four months of 2013. Through these experiences, I approach this thesis project as an “insider” in the world of



table top game designers and players, rather than as a passive observer of this vibrant community.

## **1.2. All this over...Monopoly?**

The board gaming world has expanded well beyond the small library of classics that are household names like Monopoly or Scrabble long associated with big game producer/designers like Parker Brothers and Milton Bradley. Research conducted by market researcher ICv2 reveals that the tabletop industry has grown five percent annually on average over the last five years, expanding the board game market value to \$880 million in July 2015.<sup>17</sup> In an age where barriers between consumers and producers are lower than ever<sup>10</sup>, the impressive growth in the number of board game players suggests the possibility of a growing market of “prosumer”<sup>15</sup> game designers.

There are a variety of tools to assist these prosumer designers in prototyping and playtesting thereby facilitating the game production process. Networking tools like Meetup.com allow people to immediately virtually connect with other users within their specific, geographically-localized game design community. Companies like The Game Crafter allow novice designers to publish their board games to a digital catalog without ever leaving the comfort of their own couch. With tools like *VassalEngine*, *Roll20*, and *Tabletop Simulator*, players are trying to recreate some of the essence of the face-to-face table-top experience in the digital world.

One can characterize X-reality design as that which adds an informational layer or communication extension to the world. As a mode of design, the technical and conceptual role of augmented

reality is to emphasize a layered engagement in which multiple levels of presence and world may exist.<sup>8</sup>

Meetup.com is one such form of X-reality, in that it allows members to join an online community that enables them to meet and communicate within a physical community. A search of meetups for groups dedicated to board games reveals the level of acceptance of Meetup.com as a networking tool in the board game community. With almost 900,000 members in 1,200 cities spread across 60 countries there are approximately 3,000 board game meetup groups, a significant portion of which are dedicated solely to design.<sup>6</sup>

Moreover, the self-publishing site The Game Crafter, to which any board game designer can log-in and instantly seek advice from other game designers, has over 75,000 registered users. Meanwhile on boardgamegeek.com, the largest online board game community in the world and one that is heavily populated with board game designers, a site administrator's analytics revealed that there were 782,271 users and 25,272,635 unique site visitors in the 2013 fiscal year.<sup>5</sup> These communities obviously serve as a much larger knowledge community<sup>16</sup> than a local group ever could, and the previously mentioned tools *VassalEngine*, *Roll20*, and *Tabletop Simulator* even allow players to digitally distribute and test their board game prototypes within the wider knowledge community.

While a growing number of board game designers are online, many continue to prototype using the traditional method of cutting and pasting together a paper prototype and playtesting in face-to-face situations in physical spaces. The many advantages of digitally distributing prototypes for playtesting across a large digital knowledge community potentially include testing with more playtesters, yielding greater feedback; and expediting the iteration of prototypes that lead to the final proven design for the game. In my opinion the greatest stumbling block to

achieving this goal is that a digital toolset to complete the tasks of prototyping and playtesting is not yet fully optimized for non-technical game designers.

This thesis investigates how the tabletop game design community may make better use of digital tools through the following three components: 1. The examination of literature on digital design and research into the digital tools that are currently available for tabletop game designers; 2. The construction of a set of digital tools, informed by my experience as an insider of this community, that allow designers to create digital prototypes of their tabletop games and play them online; 3. The conducting of a play-testing period with several tabletop game designers, recruited from groups around the country on Meetup.com, to test the validity of these digital tools and the possible effects that the implementation of these tools may have on the attitudes and behaviors of tabletop game designers.

## Chapter 2: LITERATURE REVIEW

### 2.1. On the remediation of board games through digital media.

In the words of Mark Deuze, “Media and life co-evolve in ways governed by the many mixed and altogether messy ways in which humans and machines co-create each other.”<sup>10</sup> In other words, it is natural that the media that humans create are reflective of instinctive human behaviors, including games. As described by James Paul Gee, games help the player to develop an inherent understanding of a semiotic domain and to expand this experience into other domains.<sup>12</sup> Thus, it is natural that the games people play change dynamically when semiotic domains expand and evolve into new domains within society. In this instance, Gee is specifically presenting the case for video games as effective learning tools, but his statement is also applicable to the larger domain of interactive media, digital or otherwise.<sup>12</sup> An analog example of this phenomenon is provided by Matthew Berland, who argues that strategic board games can be observed as computational-thinking training machines. He states that computational literacy, particularly programming, is one of the most essential skills of the 21st century, and that the logic and strict enforcement of rules required to play a board game, over a videogame, is excellent training to learn programming.<sup>3</sup>

According to Penny, it is the natural course that machines, games, and other media are derived of the technologies from which they arise. This phenomenon is known as skeuomorphism. One such example is the desktop computer, of which the interface and functionality was developed for the kinds of tasks people perform while sitting at desks.<sup>23</sup> Another example of skeuomorphism can be observed in design programs, such as Adobe

InDesign, or its lesser-known competing website-mockup applications, FreeForm and Denim. These programs can be viewed as a form of “electronic paper prototyping”, as their functionality can be traced to reflect common practices of designers sitting around a table, creating paper mockups to quickly prototype their designs.<sup>9</sup>

This process of old media shaping the new also works in the other direction. For example, Bolter and Grusin state that, “the Internet refashions television even as television refashions the Internet.” In certain instances, this refashioning that takes place between two forms of media can create yet another form of media. Bolter and Grusin also discuss how the invention of the daguerreotype, for the first time, allowed people to perfectly recreate the aesthetic of a scene. They go on to cite a similar, more modern phenomenon, namely how computer graphics experts strive to achieve photorealism, and how this process remediated photography to create yet another medium with a similar objective.

Thus, photographs and synthetic images achieve the same effect of erasure through different means. The photograph erases the human subject through the mechanics and chemistry of lens, shutter, and film. Digital graphics erases the subject algorithmically through the mathematics of perspective and shading embodied in a program. So-called digital photography is a hybrid that combines and reconfigures these two kinds of automaticity.<sup>7</sup>

This historical case of photography exemplifies the remediation that new media can incur on the old. Daniel Solis, designer of over ten published board games and a graphic artist, compares the effect that photography had on art as a means of understanding the resurgence of board games. Once man could so effectively create the richness of detail found in photography; non-photographic, artistic media moved toward the abstract; where the artist could focus on the benefits specific to the media. Similarly, explains Solis, the inability to compete with the

aesthetic complexity of modern video games has led modern board game designers to explore the advantages inherent in their media. This has contributed to the recent proliferation of modern, strategic board games.<sup>27</sup>

## 2.2. Spreadability

According to Jenkins, Ford, and Green, the term “spreadability” is deceptive, as it seems to imply a passive or viral flow of culture. However, it is, in fact, an active process that “recognizes the importance of social connections among individuals.”<sup>15</sup> One example of a weekly television series that takes full advantage of social sharing is *Tosh.0*. By strategically embracing the convergence of television and social media, comedian Daniel Tosh promotes fan participation by featuring inclusions of live fan commentary, as well as pre-planned, fan-made content in his show. By intentionally creating this transmedia modular system, Tosh *does* give up some control over his content to his fans, but in exchange he creates something that exemplifies the essence of spreadability, which is active participation and a sense of personal ownership by all participants.<sup>13</sup> There are many other examples of the successful fostering of a community through social media. In the case of the L.A. Kings, the NHL team’s Twitter account showed another aspect of spreadability during the 2012 Stanley Cup Playoffs. By establishing a genuine, albeit somewhat controversial personality toward its fans, the King’s Twitter account generated value for the image of the team that resulted in massive online participation from their fanbase.<sup>2</sup>

Another trait that increases the spreadability of a media is its modularity,<sup>14</sup> which is evident in many video games on the computer gaming platform *Steam*. Developers often publish toolkits that include intimate details of the game’s inner-workings, giving passionate fans the opportunity to expand these games. *Counter-strike*; which was modded from Valve’s critically-acclaimed first-person shooter, *Half-Life*; is an exemplary instance of successful fan-

modification. The amateur team that developed this mod displayed such a remarkably professional degree of organization that Valve purchased the intellectual property that is *Counter-strike* and hired two members of the team as permanent employees.<sup>22</sup>

Many more examples of this online participatory culture can be seen on Board Game Geek, a web community where board game fans can discuss, rate, and discover games. One section of the site is dedicated to fan-created “reskins”. These are printable components that can be used to modify an existing game, so that a player can create a new theme out of an existing game. Another example can be found on the specific pages of most of the popular games: Players, to varying extremes of respect for the original content, create their own rules for their favorite games.<sup>4</sup>

### **2.3. Knowledge communities**

Pierre Levy was an early observer of the above phenomenon in 1997 in his book, *Collective Intelligence*, in which he divides the history of mankind into four anthropological periods: the first space of signification, territorial space, commodity space, and knowledge space. In the knowledge space, to which humankind is still transitioning, the unprecedented flow of information through the web allows for massive cultural participation described in the examples above. Smaller communities that were once disjointed can now pool their information and collaborate in a greater “knowledge community.”<sup>16</sup>

Beth Coleman defines an X-Reality as a layered engagement in which multiple layers of presence may exist. Copresence, i.e. the sense of being together in a virtual environment, is a powerful tool that researchers are harnessing to use avatars and simulated environments to test

real-world dynamics. The effectiveness of these simulated social environments depends on an effective avatar or representation of the user in digital space, “At this moment, effective avatar design is based on understanding a dual mode, where one relies on persuasive visual simulation and compelling simulation of behavior. The balance between the two depends on the specific goals of the designer and the needs of the user.”<sup>8</sup>

In strictly online communities, such as forums, there is potentially a significant impact in the case that members incidentally meet offline. These offline meetings tend to provide stronger relationships between the members but also have negative, ancillary effects on “weak ties” within the online community.<sup>24</sup> C.H. Lai claims that weak ties are essential to many online communities in that they promote diversity of interaction and provide bridges of information. Thus, meeting individuals outside of an online forum may benefit the individual but have an overall negative impact on the community. Creative communities on meetup.com exhibit the qualities of an “electronic-to-face” mixed-mode group, i.e. a group that organizes online and then meets offline.<sup>19</sup> Such groups tend to evolve through physical channels. In one instance, a hiking group acquired committed members through physically meeting them through coincidence or acquaintance and handing out business cards.<sup>18</sup>

#### **2.4. Making the most of a cognitive surplus**

Clay Shirky describes the work-like participation of the average user in digital media as being driven by a *cognitive surplus*. He likens the late 20<sup>th</sup> century issue of overly watching television



to the Gin Craze in 18<sup>th</sup> century London. The endless hours of television viewership that occur throughout the world, just like the Gin Craze, are a symptom of “free time”. However, the interactive media of today allow for a level for engagement that television alone does not. Thus, amateurs are starting to display many of the work-like behaviors that in the past would be ascribed only to professionals. Shirky states that one of the biggest hurdles of amateur enterprises is their tendency to lack the organizational structure of professionals, but this hurdle is being lowered all the time by the increasing accessibility of digital, organizational tools.<sup>25</sup>

In terms of digital design, Lev Manovich discusses the digital meta-language that has evolved as an effect of software like Adobe After Effects, which has continually integrated an increasing number of semiotic languages into its functionality. A proficient user of a program like After Effects has an inherent degree of proficiency as an animator, compositor, graphic artist, etc.<sup>18</sup> This relatively inexpensive and easily obtainable program enables a great number of people, who were traditionally considered consumers of media to become media producers.<sup>20</sup>

J.T. Smith, CEO of Game Crafter, discusses the evolution of the tabletop game industry that has made the process of becoming a producer easier than ever. Every game used to go through a similar process to get published; the designer would have to go through a traditional publisher and pay out of his own pocket for several thousand game copies. In the mid-1990s, the process known as Print-N-Play was widely adopted by Indie Game Designers. The process enabled players to simply download the game and print it at their own convenience. Finally, Game Crafter stepped in as one of the most modern forms of Print-on-Demand publishing, which allows for one copy of a game to be printed at a time while still being profitable.<sup>26</sup> This process that occurred in tabletop game publishing reflects a general trend of the digital age that Chris

Andersen calls the long-tail theory, which states that the future of publishing is selling less (of each individual product) of more (different types of product).<sup>1</sup>

## 2.5. Participatory design

Participatory action research differs from traditional research in that it integrates behaviors in which participants are already engaged in the research study. In this study, rather than dictating what behaviors were to be performed by the participants, I observed and interacted with participants as they used a set of tools I assembled, enhanced and made digitally available to them as they performed prototyping and playtesting tasks they would usually do with paper cutouts in face-to-face situations. In so doing a dialog was created between the researcher and participants that captured behaviors in a way that provides valuable research feedback derived from observing and interacting with participants engaged in a “natural process”.<sup>21</sup> For example, the behaviors that were observed during playthroughs of specific games and will be discussed in **Section 8.5.** could not have been observed without allowing for an environment in which participants in the study could engage in behaviors typical of their interactions playtesting their games with one another.

Farooq, Carroll, and Ganoë discusses the advantages of collaborative design. The authors argue that distances – physical, temporal, and technological – are important sources for social creativity. In other words, there is support that a group of individuals with varying perspectives often come up with creative solutions. Groups of dyads within larger groups provide the benefit of an honest, personal exchange and a broader audience for feedback and development. Additionally, they lay down three requirements for creativity with associated design rationale:

1. *Support divergent and convergent thinking*
2. *Support shared objectives*
3. *Support reflexivity<sup>11</sup>*

## Chapter 3: CURRENT STATE OF DIGITAL TOOLS

### 3.1. Existing ways to play digital versions of tabletop games

Before deciding on *Tabletop Simulator* as the prototyping platform to be studied in this thesis, several options were examined and are reported below.

#### A. Vassal Engine

According to Vassal's website, "Vassal is a game engine for building and playing online adaptations of board games and card games. Play live on the Internet or by email. Vassal runs on all platforms, and is free, open-source software."<sup>28</sup> While Vassal certainly has its strengths as a digital tabletop gaming platform, the image in *Figure 3.1* makes some of the weaknesses of Vassal Engine apparent. The components of the game must be handled through its rudimentary 2-dimensional interface. This offers a significant barrier to entry to players, but is even more problematic for board game designers trying to upload custom content. The technical knowledge required to upload anything beyond a single set of images is very limiting. I also found implementing certain game mechanics difficult or even impossible, especially dexterity mechanics that require the stacking, throwing, or flicking of 3-dimensional objects. For these reasons Vassal would not be an appropriate tool for my study.

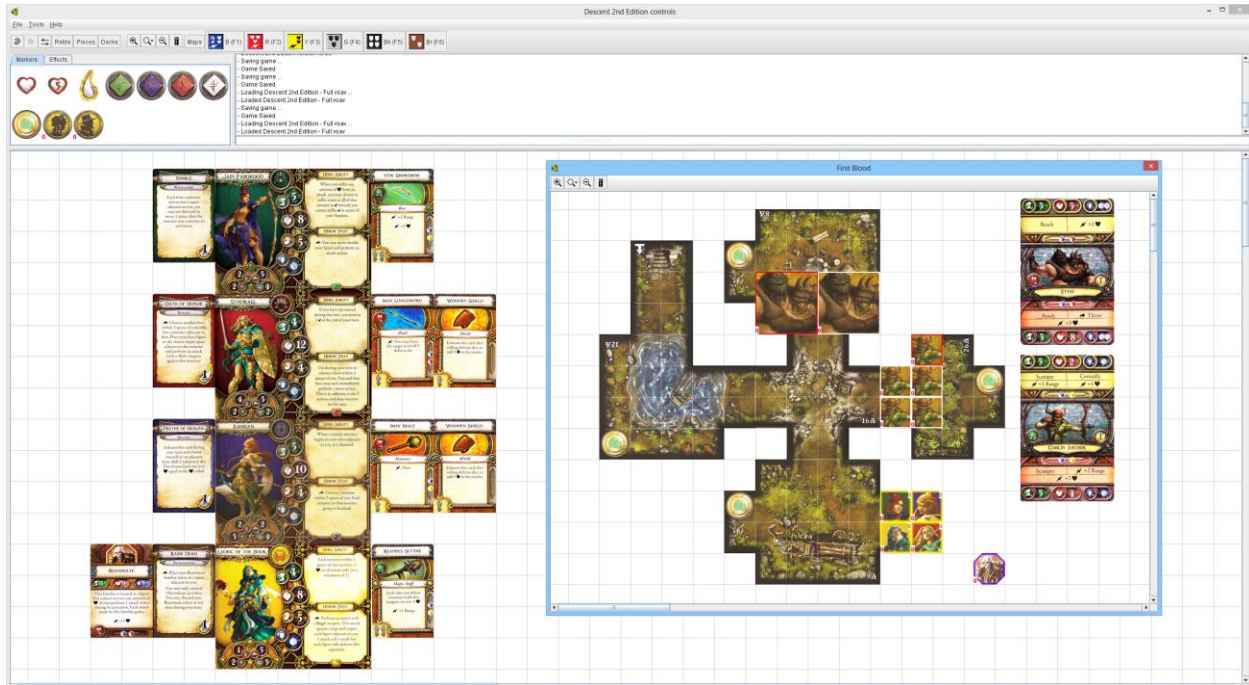


Figure 3.1: *Descent: Journeys in the Dark* open in Vassal Engine

## B. Roll20

Similar to Vassal, Roll20 features a play area that only allows for 2-dimensional images, as can be seen in *Figure 3.2*. However, Roll20 also features a robust website that allows users to network with other members of the Roll20 community. Furthermore, it is not an open-source application but is instead commercially supported. One noteworthy feature of Roll20 is its integration of each player's webcam feed into the interface. This allowed for a much more social experience than what could be offered in the visually simplistic Vassal Engine.

On the other hand, the Roll20 team has specifically designed their communication tools and play-interface for Role-playing games such as Dungeons and Dragons or Pathfinder. This means that the application is much more robust for gamers looking to play that style of game, but similarly limited for dexterity, abstract strategy, miniatures, or other sorts of games. Although I found Roll20 to be much more intuitive than Vassal, it ultimately had similar failings in terms of

creating custom games and implementing those games into Roll20's 2-dimensional, grid-like play area, and for this reason the platform was not suited for my study.

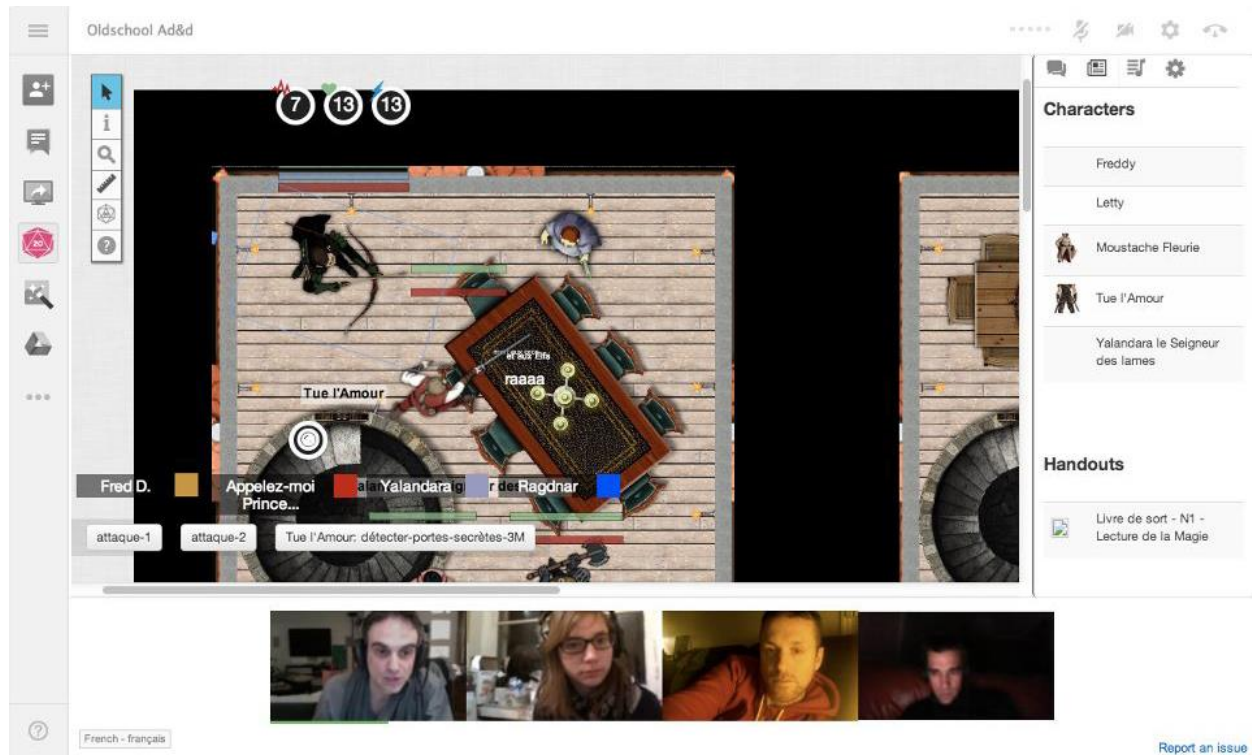


Figure 3.2: Roll20's interface with video conferencing functionality

### C. Tabletop Simulator

*Tabletop Simulator* was the third digital prototyping platform surveyed, and its strengths for the purposes of this research quickly became apparent. Unlike Vassal Engine and Roll20, in which all game components are placed in a 2-dimensional, grid-like space, *Tabletop Simulator* does exactly what its name implies, in that it presents games on a simulated tabletop in a 3-dimensional, virtual environment. I felt this was much more intuitive, as it presented a much closer one-to-one mapping of what would occur while playing a board game on an actual physical table. An example of a game in *Tabletop Simulator* can be seen in *Figure 3.3*. In this

image, if the player wants to move a red-block, they can simply click and move the red-block with the mouse-click.



*Figure 3.3: A Euro-game set-up in Tabletop Simulator*

The most notable distinction between *Tabletop Simulator* and the other two applications for the purposes of game *designers* is that game rules are not programmatically enforced, but are enforced completely by the players. One exceptional case of this is the “flip-table” button located at the top of the game’s interface. A player can literally flip the table and send the pieces flying and ruin the game for their friends (unlike real life there IS, however, an undo button). Moreover, a player can play out of turn or duplicate a card in their hand, just as they could cheat against their friends in real life. While this might make *Tabletop Simulator* less ideal for playing against anonymous strangers online, it makes it incredibly potent for tabletop game designers. Players can simply set a few custom or “proxy” components on the board, then, as it would be playing in

real life, the designer can explain the rules to the players and get started quickly. For these reasons, *Tabletop Simulator* clearly distinguished itself as the program to use for this study.

### 3.2. Existing deck-prototyping workflow tools

#### A. Tabletop simulator's included deck-building tool

Having chosen *Tabletop Simulator* as the digital prototyping platform to be used in this study, I began running solo, simulated gameplays of the application to better understand its functionality and limitations. One of the bigger hurdles seemed to be initial familiarity with using *Tabletop Simulator* and getting custom cards into the application. This is primarily due to the necessity to create a “sprite-sheet” for each deck of cards. I.e. a single image file that contains every card of the deck in a correctly-proportioned, grid-like layout.

*Tabletop Simulator* includes a sprite-sheet maker in its custom content folder (*Figure 3.4*), which allows the user to simply drag each card image into its window and save out the deck as a single file. This functionality is quite intuitive, and as it is included with *Tabletop Simulator*, it automatically saves the sprite-sheet to the correct location to open in the application. However, this tool only works for already completed images. In other words, if a designer needs to edit images or needs to create cards from scratch, they will need to use some external design application such as Adobe Photoshop and will need to re-upload a new image every time they add a new card or edits an existing card. This makes it an inconvenient but not disqualifying drawback of *Tabletop Simulator*, and is an area upon which I felt I could improve.



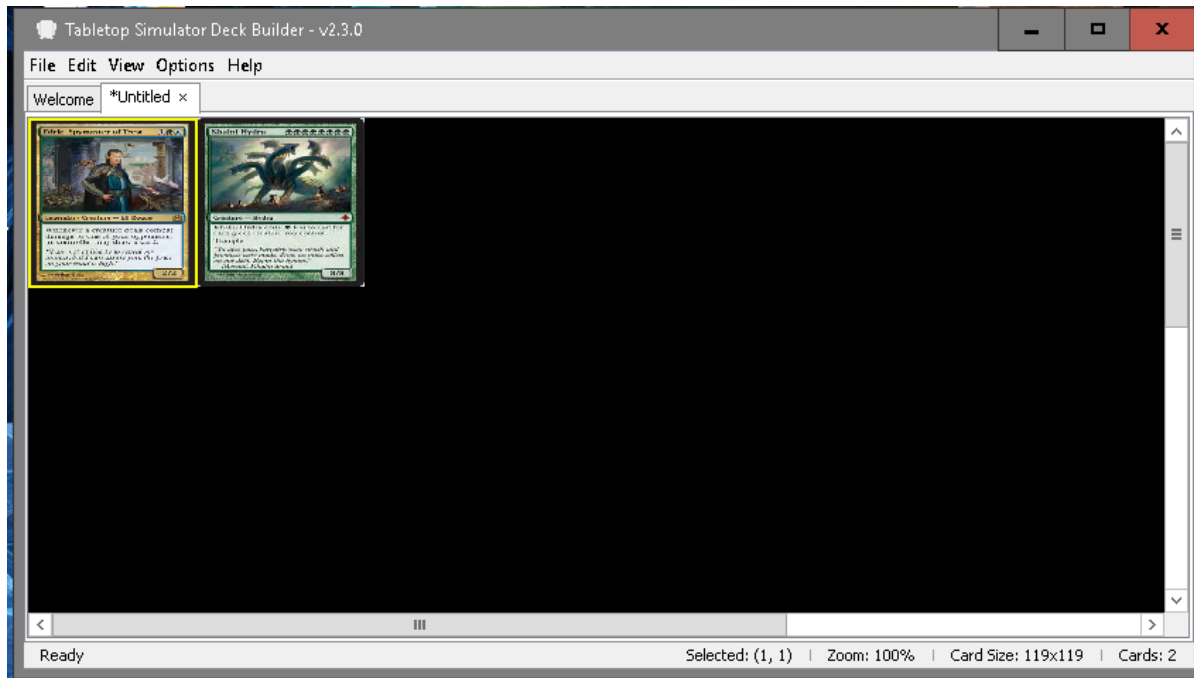


Figure 3.4: Tabletop Simulator’s own simple JavaScript sprite-maker

## B. Literally Canvas

Literally Canvas (Figure 3.5) is a web application, written in CoffeeScript, that utilizes HTML Canvas to create a literal drawing canvas (hence the name). It differs from the deck-building tool that comes with *Tabletop Simulator* in several ways. First, it has no inherent affiliation or intention to be used with tabletop gaming, but rather it is just an open-source web drawing canvas. Next it allows for image drawing and creation, unlike *Tabletop Simulator’s* app which only allows for the upload of already created cards. Finally, it is web-based, so it can be accessed in a public online location from anywhere on any device instead of needing to be downloaded and installed. I felt that for these reasons it provided a solid basis for the tool created for this thesis that is detailed in the following section.

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Help us improve Literally Canvas on [GitHub](#).

**Literally Canvas**

Literally Canvas is an extensible, open source (BSD-licensed), HTML5 drawing widget. Its only dependency is [React.js](#). You can use it to embed drawing boards in web pages. It's kind of like an extensible MS Paint in JavaScript. Users can sketch drawings and you can do what you like with the results. comes with an easy-to-use jQuery plugin.



Literally Canvas's major features include:

*Figure 3.5: Literally Canvas' homepage sums it up nicely*

## Chapter 4: RESEARCH QUESTION

### 4.1. Research Question

How can a digital toolset be developed such that it facilitates the cooperation among board game designers, who regularly attend local playtesting meetups, in the process of game development and playtesting?

### 4.2. Subsidiary Questions

1. To what degree does level of playtesting experience affect a board game designer's perception of utilizing *Tabletop Simulator* as a digital prototyping tool?
2. Will the use of a digital prototyping tool have an observable impact on the mechanics of the games being designed?

## Chapter 5: PROJECT DESIGN

After reviewing the existing prototyping tools and deciding on *Tabletop Simulator* as my game-playing platform, I produced a card creation application, *Card Creator*, and companion website, *prototypegamer.com* to carry out my study.

### 5.1. Design of *Card Creator*

*Card Creator* is a web-based application that allows the user to create new cards, upload existing card images, edit these images, and output the deck of cards as a *Tabletop Simulator* save file. This was created specifically for the game designer who had minimal design experience (less than 2 years) and likely no experience with digital prototyping. I targeted this demographic because during my experiences in the tabletop game design world, starting in Germany, I was a beginner board game designer collaborating with many designers of a similar level of experience. If I knew as a beginning game designer what I know now, being able to create digital versions of my prototypes could have saved me significant time iterating on my early ideas and getting them to be looked at by more experienced designers.

The thesis tool, *Card Creator*, was developed over several months and tracked as an open-source project on GitHub (*Figure 5.1*). The iterative process helped to focus the tool from its initial vision of being able to create an entire game of cards, boards, and other components to the ultimate study version, which focused on facilitating deck-creation and design functionality. I decided to focus this functionality in such a way because from my perspective as a once new tabletop game designer, I felt these components in *Tabletop Simulator* presented new designers

with the most difficulty. Additionally, the tool is intended to serve as a one-stop place to create both digital and print-and-play versions of a game. The tool has the ability to output the deck as a *Tabletop Simulator* save file and as a printable pdf, with the initial vision allowing the tool to benefit the development of both analog and digital versions of games. But the pdf function was ultimately removed during the testing period due to time-constraints and its lack of necessity during the digital play-testing period.

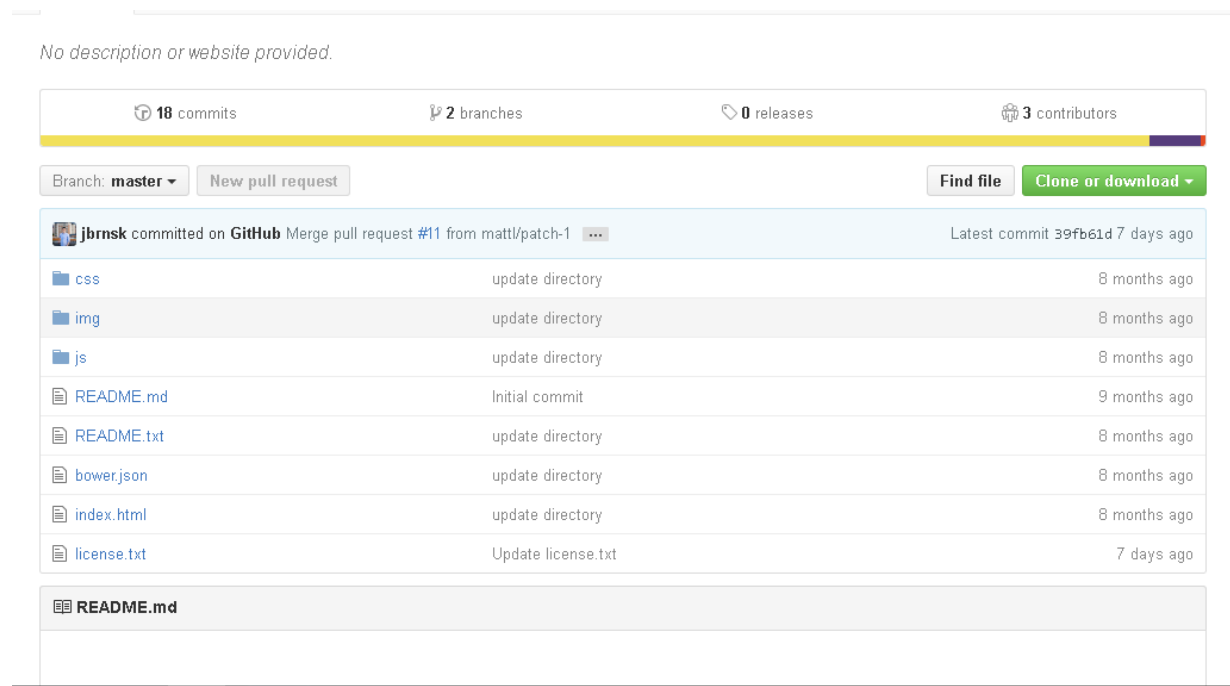


Figure 5.1: You can find the project here: <https://github.com/jbrnsk/PrototypeGamer/>

The following list and accompanying *Figure 5.2* clarify the core functionalities that were built on top of those existing in Literally Canvas for the purposes of this thesis:

1. A save function was created that uploads the current state of the canvas (aka the current card) to the online image host, Imgur. This was required because all components that require images in *Tabletop Simulator* must have those images hosted publicly online.

2. Once the user clicks “Save Current Card to Project” and the card is uploaded to Imgur, it is stored in the project and can be later placed on the canvas by clicking on the card title in the lower project menu.
3. The “Choose File” button allows the user to select any .jpeg or .png image on their computer. Once the image is selected, the user can clear the canvas and place the chosen image by pressing the “Custom” button.
4. Finally, once all the cards in the deck are added, the user can output the deck in a format that is readable by *Tabletop Simulator* by pressing on the “Download for Tabletop Simulator” button.



*Figure 5.2: Building a deck out of Magic: the Gathering Cards*

As the development time did not allow for a highly functional user interface design, a tutorial video series was created to increase the ease of use for this tool. For easy accessibility, these videos were then added to the same page as the tool itself, which will be detailed further in the following sections on the study-website layout.

## **5.2. Design of the study site: *Prototypegamer.com***

A website was created as a home for the *Card Creator* tool and to provide additional information to the study participants. This was called *Prototype Gamer*.

### **A. Home page (*Figure 5.3*)**

The home page includes an orientation video, which was produced to explain the purpose of the website and the resources available to participants of the thesis study. The home page also included blog posts detailing the play-testing period and specific details of each meeting, such as time, date, and room name on *Tabletop Simulator*.



Figure 5.3: Site Homepage

## B. Design page (Figure 5.4)

The design page includes the *Card Creator* application and the tutorial videos that were created to assist users in its use.



<https://i.imgur.com/AYFouze.png>



This prototyping tool was created to help you design a custom deck of cards for Tabletop Simulator. If you have already created cards and just need an easy way to get them into Tabletop Simulator, this tool allows you to upload images from your computer. However, they must be jpeg or png and they will be automatically resized to fit the 2.5 x 3.5 aspect ratio.

More help here:

[Tool Overview](#)

[Part 1 - Creating Your First Card](#)

[Part 2 - Building a Deck](#)

[Part 3 - Placing Image Files](#)

[Part 4 - Exporting Deck to TTS](#)

[Part 5 - Finally! Into Tabletop Simulator!](#)

### Changelog

5-16-16: Initial beta version for Drexel TTS Study.

Figure 5.4: Design page of study website

### C. Resource page (Figure 5.5)

The resource page is comprised of all of the videos for *Tabletop Simulator* that were created by Berserk Games, the developer of *Tabletop Simulator*.

The videos on this page, produced by Berserk Games, should help get you started with Tabletop Simulator.

[Introduction](#)

[Part 1 - Basic Controls](#)

[Part 2 - Advanced Controls](#)

[Part 3 - Hosting and Connecting](#)

[Part 4 - RPG Kit](#)

[Part 5 - Custom Content](#)

## Introduction



*Figure 5.5: Resources page of study website*

### **D. Community page** (*Figure 5.6*)

The community page contained information on accessing the Steam group that was created for the study, in case participants wanted to communicate with each other outside of the scheduled meetings.



Figure 5.6: Community tab of study website

## Chapter 6: METHODOLOGY

This thesis focuses on the effects of implementing digital prototyping and play-testing tools into the routines of tabletop game designers; more specifically, on potential changes in their attitudes toward digital prototyping and in their play-testing behaviors. The study was conducted entirely online, consisting of a two-week recruitment period and then a six-week testing period. Three play-testing meetings were held every two weeks over this six-week period, with the researcher as the primary organizer and point-of-contact for these play-testing sessions. The media investigated included the commercially available application, *Tabletop Simulator*, and the two components of the toolset that the researcher created: the web tool, *Card Creator*, and the accompanying website: *Prototypegamer.com*.

### 6.1. Recruitment

It was important to recruit participants for the study from a pool of board game designers who traditionally meet offline. The assumption being board game designers who meet offline may be less familiar with the digital tools being studied. While it may have been much easier to recruit from online groups that are already using digital prototyping and play-testing methods, such as the Reddit Tabletop Game Design forum which is organized and meets entirely online; I felt it would largely be self-evident that such designers have already successfully incorporated digital techniques into their play-testing process.

Based on my experience of having founded a board game meetup group and my acquaintance with several other meetup game design groups, I have intimate familiarity with

how such groups function. While no meetup group with which I had experience was used in this research, I did consider Meetup.com to be the ideal platform from which to seek out tabletop game designers for my study. Meetup.com board game designers are organized online, but meet offline to conduct prototyping and playtesting and therefore have some digital experience - exposure in communicating with other designers online. Furthermore, it would be more feasible to recruit designers for the study by emailing Meetup.com participants rather than by attempting to recruit from small groups meeting exclusively offline at various physical locations.

## **6.2. Recruitment process**

Initially, a search was performed using Meetup.com's custom search function. The search included all groups dedicated to tabletop game design, whether in the U.S. or international. This resulted in a listing of over 500 groups. To narrow the list of potential groups I devised the following criteria: 1. the group must have more than 100 members and 2. it must be in the continental U.S. This greatly reduced the eligible groups to 23 in total. From these 23 groups, it was the study's goal to get 20 tabletop game designers to agree to use the digital tools over a six-week period.

One of the major challenges in using Meetup.com as a recruitment channel is that meetup groups cannot be directly contacted through email. Instead, one must contact the group's organizers, of which there are generally one to three for each group, and have the organizers then post a message to the group at large. Working through organizers necessitated two links in the chain of communication further complicating the process. This difficulty became quickly

apparent when four random meetup groups organizers from the 23 eligible groups were contacted and briefed.

After two weeks, no participants were recruited. At this point all remaining groups in the original list of 23 were contacted. Moreover, an additional set of 40+ groups were selected based on the criteria of: 1. not having been previously selected, 2. having at least 20 members and 3. being directly related to tabletop gaming, but *not* necessarily dedicated to game *design*. From this expanded group 12 meetup organizers agreed to send out the study recruitment email to their members. When difficulty in recruitment persisted, it became apparent that I would need to develop some level of rapport with the organizers to get them to help with recruitment. I explained the study to the organizers and based on their familiarity with group members, I sought their assistance in recruiting appropriate designers for the study.

A pre-screening questionnaire sent to potential recruits was used to ensure eligibility.

Participants were required to:

1. Be 18 years or older.
2. Have play-tested one of their tabletop game designs at a meetup at least once.
3. Have access to a computer that can install Steam and *Tabletop Simulator*; microphone preferred.
4. Be able to attend at least two of the three online play-testing sessions that were scheduled on three Sunday afternoons every other week.

Potential participants were told that they would be given the unique opportunity to create a digital version of their tabletop game and to play-test it online with other board game designers

from around the country. Additionally, it was determined that financial incentive would make it much more likely to get continued participation in all three online play-testing sessions over the six weeks, so a free copy of *Tabletop Simulator* (\$20) was offered upon completion of the pre-questionnaire and an additional \$20 was promised upon completion of the post-questionnaire at the end of testing.

The preferred demographics for this test included inexperienced board game designers who had limited experience with digital design tools like Adobe Photoshop and digital prototyping tools like *Tabletop Simulator*. Also, ideally preferred were participants with no issues putting the images required for their game components online, and thus publicly available.

### **6.3. Study enrollment**

In total, 13 board game designers initially enrolled in the study. They represented five different meetup groups from the eastern and central time zones in the U.S. After they agreed to the consent terms of the study and filled out the pre-questionnaire, a free copy of *Tabletop Simulator* was sent to them via email. Additionally, upon enrollment participants were given access to the study website and instructed to watch the 5-minute orientation video on the study homepage, which provided further details about the testing period and the resources that were available on the study website. Participants were not required to make use of the web application or tutorial videos if they did not find them necessary to their workflow. They were merely encouraged to test these resources out if they sounded relevant and useful.

## 6.4. Testing period

The testing period took place over six weeks. There were three digital play-testing sessions held every other Sunday. To be considered active throughout the testing period, participants were required to attend at least two of these three sessions. Sessions were hosted online via *Tabletop Simulator*. Participants were emailed the room name and password and recommended to email the researcher if they had any issues logging-in to *Tabletop Simulator* (Figure 6.1).



Figure 6.1: Tabletop simulator, room browser and login

The first meeting was an introductory session in which any problems that participants were having with the software and/or with getting their prototypes online were discussed. After the first hour of introduction, questions, and answers, an abridged play-testing session was held for those that wanted to stay.



The second and third online sessions were held in a format mimicking the style of the offline play-testing meetings with which the participants were already familiar based on experience with Meetup. That is, the researcher asked who had a game to play-test for that meeting and the specific requirements of play-testing that game, such as playtime, number of players, and game genre. The researcher then scheduled blocks of time for play-testing each game in two different online rooms (*Figure 6.2*).



*Figure 6.2: Example of full room of players in tabletop simulator*

Participants were welcome to play-test each other's games or meet each other online at any convenient time outside of the scheduled sessions. In this way, participation outside of the scheduled play-testing sessions was encouraged but not required, but such behaviors were not tracked.

## 6.5. Study framework and target demographics

The study used a pre-questionnaire, post-questionnaire format with a focus on Likert-style questions to ascertain whether participants had displayed any changes in their attitudes toward digital prototyping and its effect on their play-testing behaviors.

The form of participatory research included the researcher playing a direct role in organizing and assisting in the play-testing sessions. During these sessions, the researcher did not participate in any of the actual play-testing and only provided help and/or feedback to direct questions. Behaviors were recorded via screen capture for later review. The screen captures were destroyed once reviews were conducted. The research was conducted in the following manner (complete versions of questionnaires available in the appendix):

### 1. Pre-Test Questionnaire

#### (a) Gathers quantitative data about the user:

- i. Age
- ii. Gender
- iii. Education
- iv. Computer experience
- v. Digital design program (Photoshop) experience
- v. Video game experience
- vi. Steam experience
- vii. Tabletop Simulator experience
- viii. Board gaming experience
- ix. Board game play-testing experience
- x. Board game design experience

#### (b) Gathers opinions and self-reported perceptions of play-testing of the user:

- i. Actual play-tests per month

- ii. Ideal number of play-tests per month
  - iii. Actual number of unique play-testers per month
  - iv. Ideal number of unique play-testers per month
  - (c) Likert style self-reported opinions on digital prototyping and play-testing (see appendix)
2. Play-testing sessions
- (a) Gathers qualitative observational data during gameplay such as:
    - i. Differences dictated by digital medium
    - ii. Problems/issues arising from medium
3. Post Questionnaire
- (a) Repeated expectations of play-testing
  - (b) Likert style self-reported opinions on digital prototyping and play-testing (see appendix)
  - (c) Open-Ended Questions
    - i. On study website
    - ii. On design tool
    - iii. On self-reported changes of perception after using Tabletop Simulator
    - iv. On using Tabletop Simulator in the future

## Chapter 7: RESULTS

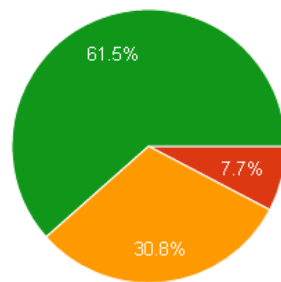
This section will discuss results with a focus on the qualitative feedback provided by the participants at the end of the play-testing period.

### 7.1. Pre-questionnaire data

The age range of the 13 participants was 28 – 42 years old with a mean of 35. All of the participants were male and had experience in higher education. Six had earned a 4-year undergraduate degree, five had completed a graduate education, and two participants had completed some college.

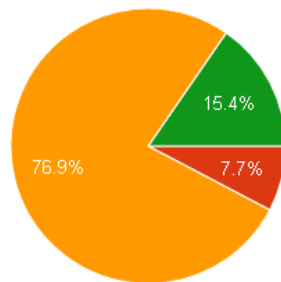
The following *Figures 7.1 – 7.3* present some numerical data on the previous experiences of the study population. *Figure 7.1 and 7.2* show that participants had significant experience in computing technology; with design tools like *Adobe Photoshop*; with the computer game platform, *Steam*; and even with *Tabletop Simulator*.

### Computers (13 responses)



- I use computers as seldom as the 21st century allows.
- I use email and other basic functionality of computers almost daily, but seldom work with more co...
- I use applications significantly more advanced than email or word processing almost daily.
- I consider myself an expert user of computing technology.

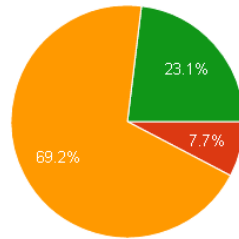
### Design (13 responses)



- I have never used digital design tools, such as Adobe Photoshop or an equivalent open-source program.
- I know some basic functionality of Photoshop or an equivalent program, but hardly ever use them.
- I use digital design programs regularly and have a good understanding of th...
- I consider myself a professional user of one or more digital design applica...

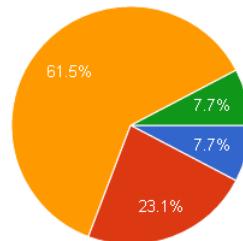
*Figure 7.1: Computing skills/experience*

### Video Gaming Experience (13 responses)



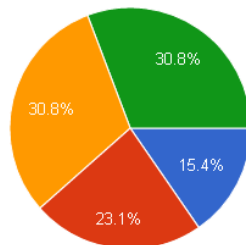
- I never play video games.
- I play video games on rare occasion.
- I consider video gaming one of my hobbies.
- I play over 15 hours of video games in an average week.

### Steam Experience (13 responses)



- I created my first Steam account specifically for this study.
- I already had a Steam account before hearing of this study, but I hardly ever use it.
- I regularly use Steam.
- I play games in Steam for over 15 hours in an average week.

### Tabletop Simulator Experience (13 responses)



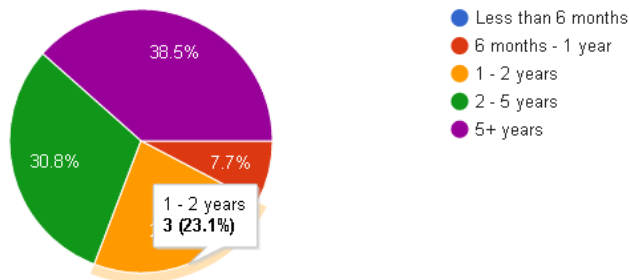
- I never heard of it before receiving the study recruitment email.
- I had at least heard of it before receiving the study recruitment email.
- I am familiar with its functionality and/or have seen videos of it being played.
- I already own it.

*Figure 7.2: Video gaming experience*

I have been playing board games for... (13 responses)



I have been play-testing board game prototypes for... (13 responses)



In terms of actually designing my own board games, I consider myself... (13 responses)

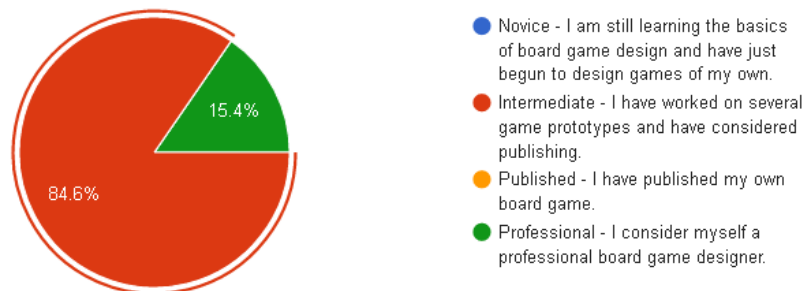


Figure 7.3: Board game play and design experience

Figure 7.3 shows that every participant had over five years of board gaming experience, in addition to significant experience with board game *design*. Figure 7.4 begins the Likert section of the questionnaire (1 – strongly disagree, 5 – strongly agree), and shows that the majority of participants had previously considered digital prototyping.

Before receiving the recruitment email for this study, I had never considered using a digital prototyping platform to test my board game prototypes.

(13 responses)

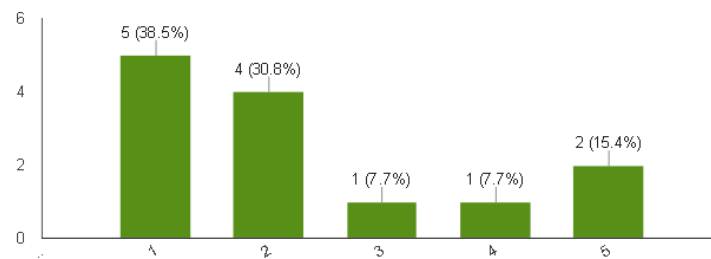


Figure 7.4: Distribution of those who previously considered digital prototyping

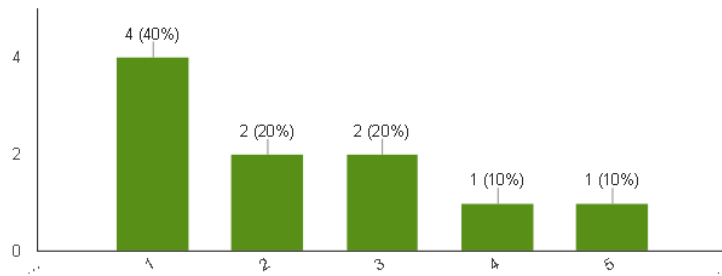
## 7.2. Post-questionnaire data

Ten participants (76.9%) finished the six-week testing period and the post-study questionnaire. The Likert answers (1 – strongly disagree, 5 strongly agree) in Figures 7.5 show how participation in the study effected the participants’ perceptions of their own behaviors and attitudes toward board game design and digital prototyping tools.



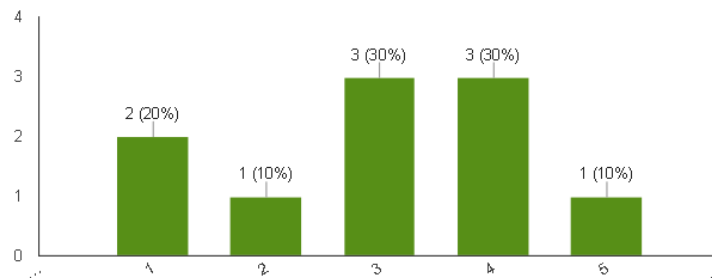
I am play-testing my prototype more frequently since the start of the study.

(10 responses)



I have a significantly larger pool of play-testers since beginning this study.

(10 responses)



Participation in this study has encouraged me to utilize Tabletop Simulator more in the future.

(10 responses)

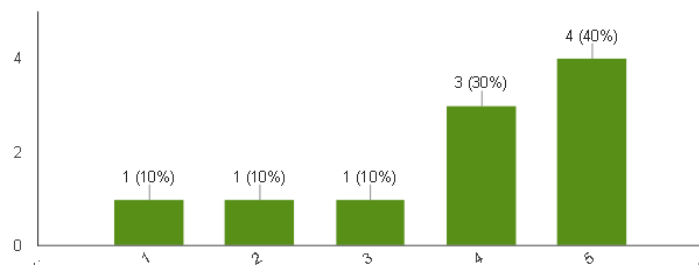
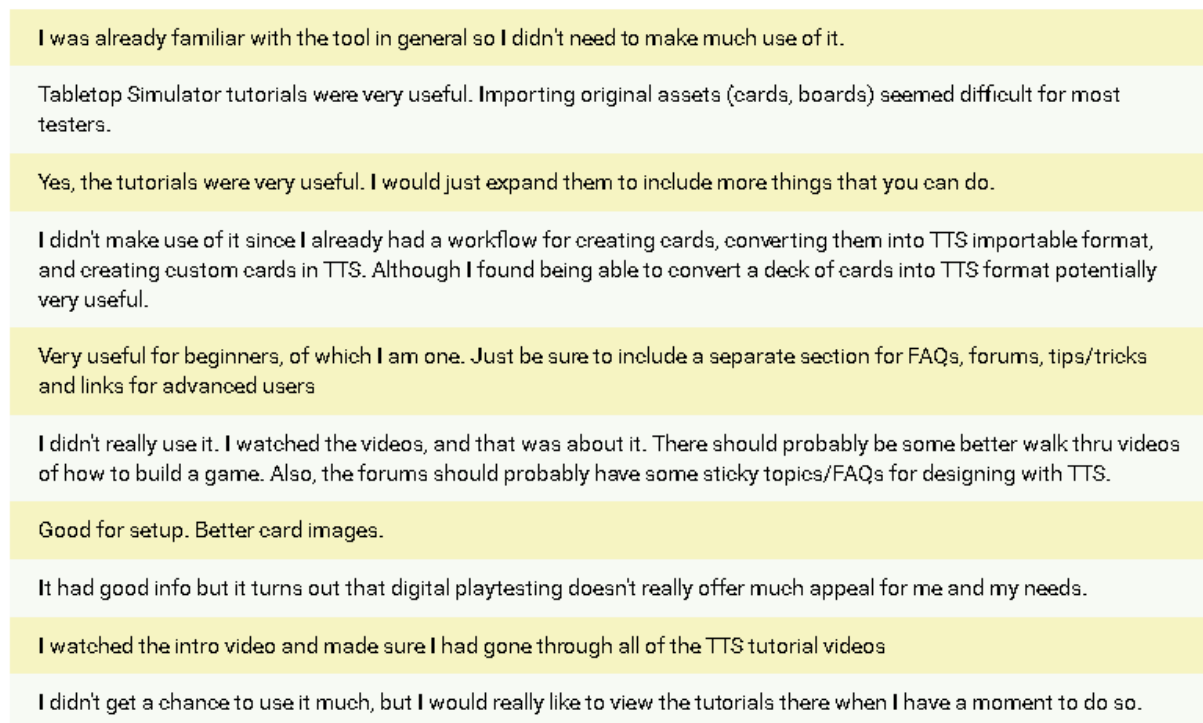


Figure 7.5: They will be using Tabletop Simulator more

Finally, these play-testing style, open-ended questions provided insight into the participants' thoughts on various aspects of the study, including web components. Questions and a summarization of the participants' answers break down as follows:

Did you make use of the study website [prototypegamer.com](http://prototypegamer.com)? If so, what aspects of the site did you find most helpful? If we were to run the study again in the future, what changes would you recommend to make the study website more useful?

(10 responses)



*Figure 7.6: Use of the study website?*

Did you make any use of the design tool on the study website? How so? Would there be functionality worth adding to better assist board game designers in creating digital prototypes in the future?

(10 responses)

I was already familiar with the tool in general so I didn't need to make much use of it.

Although a tool was provided to assist with custom content importing, this area could be improved in the future.

Yes, I created some cards and some dice. That is far as I got as I didn't have time to fully complete a prototype of my game.

I unfortunately did not. The software I have imports card info from Google docs and combines it with locally stored assets (pictures) to make the cards I'm using. From there I drag them into google drawings, snap them together into a 10x7 grid, download as .png, upload to imgur, and import to TTS. It might be easier to drag the images into the design tool and export from there, but I haven't done it yet so I'm not sure.

Have stop points or chapters setup so you can watch, do, pause, and continue later as you complete milestones?

No i did not use it. I already have software to design with.

Better card images

I didn't use them

I examined it briefly, but already had card images ready to import into TTS. I think the ability to 1)define a template, 2)upload a spreadsheet (csv, etc), 3)output cards or a TTS deck image - would be very useful to a lot of designers.

I did not have a chance to.

*Figure 7.7: Use of the study tool?*

## Over the testing period, have you noticed any ways that your use of Tabletop Simulator has changed your perception of digital prototyping? If yes, how so?

(10 responses)

I am more aware of some of its limitations based on seeing other prototypes from different genres.
TS now seems like a very viable option for prototyping and receiving player feedback.
No because I had never used Tabletop simulator before so I didn't know what to expect.
It makes fast iteration very easy. I'm completely sold on using TTS for playtesting.
yes. I had no idea it was this easy. Additionally, anything that forces me to get things more finalized is a good thing. I have no excuses not to try it for my next game design.
I had many problems with voice chat and general slowdown/freezing of the game. everything on my end seemed fine, connection speed, hardware, etc, so I don't know what the real issue was. It was very much a hassle to deal with. Also, a host crashing or freezing is very devastating. During the initial play of my game, the host computer crashed after the rules were finished being explained and the game was just starting.
I did not know there a tool like tabletop. It gave me awareness.
Nope
I had examined TTS in the past, but wasn't sure I could implement my game in it. The testing period prompted me to try, and I was pleasantly surprised. Now I'm very excited about the efficiency / possibilities digital prototyping allows. Relying on voice chat doesn't allow you to observe nonverbal player behavior, and conversation doesn't always flow well with push-to-talk in the mix. TTS seems to have a number of voice chat and network issues that are disruptive. I expected this sort of problem, so that perception remains unchanged. I think the voice issue could probably be solved by using an external voice chat program.
It was generally more successful than I had expected it to be, however, some things (like card drafting) are still very difficult. However, I think that this can be remedied in the future.

*Figure 7.8: Tabletop Simulator effects?*

Do you think you will be using Tabletop Simulator more in the future... for play-testing? ... for casually playing commercially-produced board games online?  
Why or why not?

(10 responses)

Primarily playtesting
I would like to utilize TS for playtesting my own and other prototypes because of the positive, highly effective experiences during this study. I am also using TS to play user generated and commercially produced games.
In its current state, I will not likely use Tabletop Simulator for my current game because there are too many components to create. For a simpler game, I might consider it. I also am not likely to use it to play board games online either because I prefer face-to-face gaming (for the social aspect).
Probably not as much for playing games online as I enjoy meeting up with friends for that. But since only a small percentage of the board game community playtests and designs games, being able to meet with other designers regardless of location helps immensely to get playtesting done.
I will absolutely try. My plan is to try to make a game print and play ready, but instead of printing, upload it to tabletop simulator. Then I have a clear, playable snapshot of my games version. I also co-design games with my remote business partner, so the ability to playtest at a distance is NICE.
Possibly. It is much harder to explain games and rules in the digital setting.
Yes. It will give me more play testers
Nope. It's a pain to use, pulls users out of the social experience of playing the game, and is generally just worse than playing face to face.
Definitely for play-testing. I can imagine casually playing commercially produced games, but not often. I'm more likely to play commercial games for the social experience, and TTS wouldn't be my first choice for that. If faraway friends were interested, TTS would be my go to program.
Yes, especially for play-testing. In terms of playing commercially-produced board games, I'm much more likely to get the iPad version and play it in person with friends than to play an electronic version online.

*Figure 7.9: Using Tabletop Simulator again?*

## Chapter 8: DISCUSSION

This section discusses the important issues at which this thesis arrives, informed by the literature reviewed, data collected from the questionnaires and participant feedback, and observations that were recorded during playtesting sessions.

### 8.1. Analysis of participant demographics

Thirteen designers began the study; ten (76.9%) remained active during the six-week period and completed the post-study questionnaire. The sample size was smaller than originally intended; moreover, the results the demographics presented in the previous section did not represent the designers that I anticipated recruiting. *Figures 7.1 and 7.2* from the previous chapter show that there were zero participants who answered that they have NO experience with design tools like Photoshop, and only one participant said he had limited experience with such tools. All other participants had significant experience in computing technology; with design tools, with the computer game platform, *Steam* and even with *Tabletop Simulator*. *Figure 7.3* shows that the participants also had significant experience with board game design, as everyone had played board games for over five years and considered themselves at least intermediate in terms of experience creating their own board game prototypes.

The participants' high level of comfort with digital prototyping is reflected in their answers to the Likert Questionnaire Statement in *Figure 7.4*, "Before receiving the recruitment email for this study, I had never considered using a digital prototyping platform to test my board game prototypes." While I initially anticipated testing my *Card Creator* and the commercially-

available *Tabletop Simulator* on designers who agreed with this statement (i.e. they had never considered digital prototyping), only three participants had never considered using a digital prototype to test their own tabletop game.

Per Levy, a knowledge community is first comprised of its individual members, each with their own set of unique experiences.<sup>16</sup> One major accomplishment of this study was that it successfully bridged designers of varying experiences and locations from five different *Meetup* groups, thus tapping into the greater board game design knowledge community that is available but unrealized on *Meetup.com*. It is not a failure of the study that the participants recruited were more digitally experienced than anticipated; rather, it is an unexpected result. The next step in research would be to test with a larger group consisting of the initial target user-base of less experienced board game designers.

## **8.2. A closer look at three participants**

It is worth examining those three participants who had never considered digital prototyping, as they were the only board game designers whose experience-level matched the initial recruitment goal of the study. Of those three, one did not complete the study (in contrast to the 88% completion rate in the group that “had considered digital prototyping”). One other participant was the only one who made use of the *Card Creator* tool to import his deck of cards into *Tabletop Simulator* (whereas all the others who had considered using digital prototypes spent a short amount of time on the tool – *if they tested it at all* – and then seemed comfortable making their own sprite-sheets for their decks of cards via other methods). One more never uploaded a digital version of his prototype.

The fact that this subset of the group of participants struggled with creating a digital prototype, and that the one who did manage to create a digital prototype depended on my *Card Creator* tool to upload a deck of cards, supports my premise for the creation of the tool. I believe that there is still much that the usability of digital board game prototyping technology is lacking. This is further supported by the fact that even some of those participants who owned *Tabletop Simulator* and had used it for play-testing their prototypes before the study expressed in *Figure 7.7* a desire for a tool that could streamline the creation of digital versions of their games. For the one user who had no awareness of or experience with digital prototyping but still managed to get his game online with the help of my tool, it may be the case that my tool was just enough to help him embrace digital prototyping. He said “[I] did not know there was a tool like tabletop, the study gave me awareness” and that, “Yes,” he will continue to use *Tabletop Simulator* to playtest in the future as it will “give me more playtesters.”

As for the user in this subgroup that completed the study but did not manage to upload a complete prototype of his game, the participant stated in *Figure 7.7* “Yes, I created some cards and some dice. That was as far as I got as I didn’t have time to fully complete a prototype of my game.” For him the process of digital prototyping was too tedious as he stated, “In its current state, I will not likely use *Tabletop Simulator* for my current game because there are too many components to create. For a simpler game, I might consider it. I am also not likely to use it to play board games online either because I prefer face-to-face gaming (for the social aspect).” Though he did make some use of *Card Creator*, it ultimately was not effective enough for him to embrace digital prototyping.



### 8.3. Issues in Recruitment

Several hurdles were encountered during participant recruitment through the online networking platform, *Meetup.com*. The first several issues are general issues that would likely be encountered with any online recruiting platform. There was the potential for self-selection bias, as members of *Meetup* were likely more willing to sign-up for a study on digital prototyping if they were already familiar and comfortable with digital tools. Also, members of *Meetup* are already using a digital platform to meet other board game designers, so there is bias inherent to using an online recruitment channel. There are likely many board game designers apart from *Meetup* still using offline means of meeting and organizing at brick-and-mortar board game stores, who may be generally less likely to consider any assortment of digital tools.

There was one major issue specific to the platform *Meetup.com*. In my experience as a *Meetup* organizer in Berlin, I had the ability to email all members of my group directly. Due partly to this experience I had overlooked that, as a *non-organizer* of the groups from which I would be recruiting, I could not directly message members. This is a limitation by *Meetup* to prevent anybody who signs up for a group to be able to spam the entire group. So alternatively, I had to direct-message the organizers of the group and relied on them to reach out to their members. One potential explanation for the difference in expectations in recruiting versus who I ended up *actually recruiting* is that the *Meetup* organizers, who helped me find participants, could have intentionally picked members of their group who they thought were more experienced and would provide greater benefit for my study. Due to this limitation in recruitment, I cannot definitively say what process the contacted organizers underwent to find participants among their group. While I was hoping to get a significant representation of inexperienced designers to participate in the study, it is entirely possible that the recruitment

avenue made this difficult, as organizers could have specifically selected the members of their group that they thought would most likely complete the study, especially since the 40 groups contacted were not strictly limited to design.

#### **8.4. Feedback on *Card Creator***

In general, participants who enrolled in the study were much more deeply immersed in digital tools than I anticipated. However, the *Card Creator* tool that I designed to be used in conjunction with *Tabletop Simulator* was designed for an inexperienced game design audience who was less familiar with digital design tools and board game design. The intent of that design may likely be explained by my own personal bias in designing my tool for an idealized user with whom I had intimate familiarity, detailed in **Chapter 1**: me as a less-experienced, 22-year-old board game designer involved with a Meetup group 5 years ago.

Mark Deuze states that as media becomes popular it fades to the background and its users become unaware of its presence.<sup>10</sup> I thought it might be part of my role to convince participants that they were already using digital technologies in their daily lives from the use of cell phones to computer applications at work; utilizing computer technologies to become more effective board game producers was a logical next step. I saw this in terms of Coleman's X-reality where living in media meant crossing lines between the physical and virtual.<sup>8</sup> Much to my surprise however, I misjudged how deeply the members of this community had not only been immersed in media but were fully aware of the potentials of using digital media technologies for board game design and playtesting. I assumed that the average member of these Meetup groups, who physically meet and play games face-to-face, would look like the digital novices I had met

several years before at such groups. I am amazed at how quickly and widely digital media technologies have been absorbed into the board game culture. Groups of board game enthusiasts who once seemed averse to digital technologies have now fully embraced them. The transformation occurred invisibly to me, consequently the participants I recruited were much more technically-savvy than anticipated.

Nonetheless, the responses in *Figure 7.6 and 7.7* showed that there was use for the resources I created and provided; namely the website, *Prototypegamer.com*, and the thesis tool, *Card*, despite the participants' unanticipated level of experience. In response to the questions "Did you make use of the study website *prototypegamer.com*? If so, what aspects of the site did you find most helpful? If we were to run the study again in the future, what changes would you recommend to make the study website more useful?" five of the ten responses were generally positive. One response stated, "Yes, the website was very useful. I would just expand them to include more things that you can do." The remaining responses were not necessarily negative toward the content provided on the website; instead, they reflected that the users did not get a chance to use the resources or were experienced enough with *Tabletop Simulator* and digital prototyping to not need the information provided.

The following questions were: "Did you make use of the design tool – i.e. *Card Creator* – on the study website? How so? Would there be functionality worth adding to better assist board game designers in creating digital prototypes in the future?" Most participants admitted they did not provide much more than a cursory test, if any test at all, of the tool. This is exemplified by responses like, "No. I did not. I already have software to design with." However, there were also two responses from the more experienced users that displayed some desire for improvement in digital prototyping that the *Card Creator* tool attempted to alleviate: "I examined it briefly, but

already had card images ready to import into TTS. I think the ability to 1) define a template, 2) upload a spreadsheet (csv, etc.), 3) output cards or a TTS deck image- would be very useful to a lot of designers.”

### **8.5. On *Tabletop Simulator***

As suggested by Beth Coleman, the level of co-presence in a simulated environment determines the effectiveness of a virtual simulation. This “co-presence” is dictated by both persuasive visual reproduction and compelling simulation of behavior.<sup>8</sup> In this study, when a game mechanic could not be accurately represented or when technical issues interfered with the simulation, co-presence was lost. As the play-testing sessions were recorded, several behaviors are summarized below that exemplify when co-presence was or was not maintained:

#### **A. Abstract strategy game using tokens instead of figurines**

One designer in particular was a staunch supporter of *Tabletop Simulator* as a play-testing platform for inexperienced game designers even before enrolling in the study. He claimed in a discussion during the second play-testing session that he made a significant design change to his strategy game directly because of *Tabletop Simulator*. In his game, there are various ranks of pieces as in chess that he was representing using different figurines. After creating a digital version of his game in *Tabletop Simulator*, he realized that the pieces should be circular tokens as found in Checkers because the player could easily flip the tokens to neatly represent whether a piece was “ready” or “exhausted.” He accredits this change in the piece-design to a shift in perspective of usability that was created by the digital version. *Tabletop Simulator* created a

degree of immersion that allowed that participant to not only consider it an effective prototyping tool, but to also help him make positive changes to the game's mechanics.

### **B. Dexterity mechanic**

Another designer created a digital version of his war game in *Tabletop Simulator*. This game entailed combat between ships with a dexterity mechanic that involved flicking dice at the enemy ship. In contrast to the previous example, where playing the digital version may have ultimately helped in the play-testing and design of the game, the play-testing of this war game was hurt by the digital platform. Although *Tabletop Simulator* does have a function that allows players to digitally “flick” game pieces, the flicking was much more precise than when a player flicks a dice in real life (similar, for example, to the problems inherent in a digital version of billiards). This highlights the importance of a strong sense of co-presence for designers looking for quality feedback in *Tabletop Simulator*. In the described scenario, the limitations of the medium were brought to the forefront and could not completely accurately reflect the real world; thus, the play-testing results were questionable at best for this designer in terms of understanding how players feel about his core gameplay mechanic.

### **C. Other digital issues**

There were a few more general issues that occurred with *Tabletop Simulator* during the play-testing sessions that would not have occurred in a physical play-testing environment. Most commonly, participants had issues with their microphones cutting out or the sound from other participants becoming more difficult to hear over time. I can only conjecture that this was some sort of software issue inherent to *Tabletop Simulator*, especially because I experienced firsthand needing to restart *Tabletop Simulator* because it did not properly read that my microphone was

connected. Whatever the reason for such issues, the underlying technical problem could not often be identified, and this was a direct hindrance to play-testing and providing feedback. In fact, digitally-experienced participants mentioned that the problem was an issue enough in the past that they decided to use some other external application for communication when they used *Tabletop Simulator* with their own playgroups. Additionally, during one play-testing session my computer crashed and, as I was the host of the room, the room on *Tabletop Simulator* was closed, destroying all the progress made in the game during that session. This effectively ended that playtest without any useful results for the participant.

With those examples observed, results from the post-questionnaires show that digital playtesting in an environment like *Tabletop Simulator* can result in an increase in the quality of feedback. *Figure 7.10* supports this by presenting how most participants in the study will continue to use *Tabletop Simulator* for playtesting in the future. However, this figure also shows that the inefficiencies of *Tabletop Simulator* were enough of a distraction that a few participants reported that they are not likely to use *Tabletop Simulator* in the future.

## Chapter 9: CONCLUSIONS

### 9.1. Summary

This thesis showed how a digital toolset can be developed such that it facilitates the cooperation among board game designers in the processes of game development and playtesting. From the potential for quicker iteration with a larger pool of playtesters to providing a shift in perspective of usability, the board game designers who participated in the study are largely embracing digital tools for prototyping, playtesting, organization, and more. *Tabletop Simulator* proved to be a proficient digital playtesting platform for many tabletop game designers, as 7 out of 10 agreed with the statement, “Participation in this study has encouraged me to utilize *Tabletop Simulator* more in the future.” However, the remaining few participants found the platform lacking in one or more ways and prefer to prototype in the traditional analog fashion, citing reasons such as, citing that the creation of a game with many components is still too tedious or that technical issues such as mics cutting out or images not loading completely pulls the user out of the gameplay experience.

I created the thesis tool, *Card Creator*, with the intent of helping inexperienced designers more easily create digital versions of their prototypes on *Tabletop Simulator*. While the target demographic was inexperienced designers, the participants who were actually recruited were much more experienced game designers and users of digital media. The reasons for the discrepancy were largely due to the circumstance that I had to contact the *Meetup* organizers as an intermediary for communication with their groups’ members.

Despite the unexpected overall level of digital experience of participants, three game designers in the study matched the initial target demographic, answering that they had never before considered digital prototyping. Based on information obtained in the interviews, these respondents proved to be the most in-need of a workflow tool to help them get their games onto *Tabletop Simulator*, and the only participant who successfully used the *Card Creator* workflow to get his game onto *Tabletop Simulator* fell within this subgroup.

This supports the initial premise for the creation of the *Card Creator* workflow tool: that tabletop game designers who do not have exposure to digital prototyping need a more streamlined and accessible process to make the most of digital prototyping and playtesting. The need for a more efficient digital toolset is further supported by the feedback of those experienced designers who had no need for *Card Creator* because they had already established their own workflows for creating digital componentry for their tabletop games. These participants said they could potentially make use of a further-developed version of *Card Creator* that more easily let them create and edit their games with *Tabletop Simulator*, as they acknowledged the noted inefficiencies with the current state of the digital prototyping toolset that is commercially available.

## 9.2. Future Research

In its initial conception, *Card Creator* was intended to be a tool that would allow board game designers to create and maintain their games in one location that could output both digital and analog (or *Print-and-Play*) versions of their games. Due to a limited timeframe, the functionality had to be pared down to be a simpler card-maker that outputs a save file for *Tabletop Simulator*



that is limited to a single deck of cards, and no other components. This tool can be expanded by allowing for a more robust assortment of game componentry and output types, such as a printable PDF version of all of the game components, such as cards, tiles, playing surface or board, tokens, or more.

Additionally, one of the biggest issues encountered in this project was in the recruitment process. If I were to run the study a second time, rather than recruit online, I would go directly to physical board game meetups where it would be much easier to explain the study and to target and convince game designers with limited exposure in digital media to test the digital toolset. I chose the online recruitment channel to reach a larger pool of game designers and to avoid the potential bias created by personally meeting with game designers and developing a rapport with them to get them to enroll in my study. For this same reason, I also avoided recruiting from meetup groups with which I had previous strong affiliation in Berlin and Boston. This reluctance to meet groups in person proved limiting, and a different recruitment approach would be much more likely to reveal results reflective of the target demographic of less-experienced game designers.

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## Appendix

### A.1. Terms

*board game* – in this instance, specifically referring to the strategic tabletop games that have surged in popularity during the last 15 years. I.e. the style of game that is typical of those rated highly on boardgamegeek.com.

*board game designer* – a person who self-identifies as a creator of board games, and who actively participates and communicates with others within a board game design community.

*Imgur* – the online image sharing community and image host.

*meetups* – the meetings scheduled through Meetup.com, which is an online social networking platform that enables users who share similar interests to meet in a physical location and socialize.

*mod* – a user-generated alteration to a commercially-released video game, made using open-source developer tools.

*Print-and-play* – a version of a board game in a digital format, such as PDF, that allows others to download, print, assemble, and play the game.

*Steam* – a video game distribution and management platform created by the video game company, Valve.

*Tabletop Simulator* – a simulated physics environment, distributed through Steam, which enables the networked play of digital versions of tabletop games. Here, it is being used to play prototype games, but it is more typically used to play commercially-available games.

## A.2. Drexel University Tabletop Simulator Pre – Study Questionnaire

Please fill out all of the answers in this form. After your answers are received you will be gifted your copy of Tabletop Simulator through Steam. You will also be given access to the study's website where additional resources will be provided to assist you during the play-testing period of this study.

As play-testers and designers, you are already well aware that all honest answers are helpful answers!

### DEMOGRAPHICS

Participant ID#

\_\_\_\_\_

Age

\_\_\_\_\_

Gender

\_\_\_\_\_

### DIGITAL EXPERIENCE

Please choose the option that most closely matches your experience with digital media.

#### Computer Experience: Please Check One

- I use computers as seldom as the 21<sup>st</sup> century allows.
- I use email and other basic functionality of computers almost daily, but seldom work with more complex programs.
- I use applications significantly more advanced than email or word processing almost daily.
- I consider myself an expert user of computing technology

#### Design Experience: Please Check One

- I have never used digital design tools, such as Adobe Photoshop or an equivalent open-source program.
- I know some basic functionality of Photoshop or an equivalent program, but hardly ever use them

I use digital design programs regularly and have a good understanding of their technical capabilities.

I consider myself a professional user of one or more digital design applications, such as Adobe Photoshop.

**Video Gaming Experience: Please Check One**

I never play video games.

I play video games on rare occasion.

I consider video gaming one of my hobbies.

I play over 15 hours of video games in an average week.

**Steam Experience: Please Check One**

I created my first Steam account specifically for this study.

I already had a Steam account before hearing of this study, but hardly ever use it.

I regularly use Steam.

I play games in Steam for over 15 hours in an average week.

**Tabletop Simulator Experience: Please Check One**

I never heard of it before receiving the study recruitment email.

I had at least heard of it before receiving the study recruitment email.

I am familiar with its functionality and/or have seen videos of it being played.

I already own it.

**BOARD GAME DESIGN EXPERIENCE**

Please choose the option that most closely matches your experience with board game design.

**I have been playing board game s for...**

Less than 6 months

6 months – 1 year

1-2 years

2-5 years

5+ years

**I have been play-testing board game prototypes for...**

- Less than 6 months
- 6 months – 1 year
- 1-2 years
- 2-5 years
- 5+ years

**In terms of actually designing my own board games, I consider myself...**

- Novice- I am still learning the basics of board game design and have just begun to design my games of my own.
- Intermediate – I have worked on several game prototypes and have considered publishing.
- Published – I have published my own board game.
- Professional – I consider myself a professional board game designer.

**EXPECTATIONS OF PLAY\_TESTING**

Please answer these questions about the prototype that you intend on play-testing in this study. If it is too difficult to estimate an answer for any of these or if you feel the question is not applicable, you can say that!

On average, how many play-test (complete play-throughs) of your prototype do you complete per month?

---

Ideally, how many play-tests (complete play-throughs) of your prototype would you like to complete per month?

---

On average, how many unique play-testers test your game per month?

---

On average, how many unique play-testers would you like to test your prototype per month?

---

**OPINIONS**

**Please respond with how strongly you agree or disagree with the below statements.**

1. Before receiving the recruitment email for this study, I had never considered using a digital prototyping platform to test my board game prototypes.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

2. I enjoy playing digital versions of board games as much as their physical version.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

3. I have never before considered collaborating in the design of a board game with a group of 4 or more game designers.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

4. When I play-test my own game, receiving quality feedback is more important than the social experience.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

**(Optional) If you have any additional feedback that you would like to add about this questionnaire or this study, please feel free to add it here.**

---



### A.3. Pre- and Post- Study Likert Scale Questionnaire

#### PARTICIPANT ID#

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#### EXPECTATIONS OF PLAY-TESTING

On average, how many play-test (complete play-throughs) of your prototype do you complete per month?

---

Ideally, how many play-tests (complete play-throughs) of your prototype would you like to complete per month?

---

On average, how many unique play-testers test your game per month?

---

On average, how many unique play-testers would you like to test your prototype per month?

---

#### OPINIONS

Please respond with how strongly you agree or disagree with the below statements.

1. I enjoy playing digital versions of board games as much as their physical version.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

2. I have never before considered collaborating in the design of a board game with a group of 4 or more game designers.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

3. When I play-test my own game, receiving quality feedback is more important than the social experience.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

4. I am play-testing my prototype more frequently since the start of the study.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

5. I have a significantly larger pool of play-testers since the beginning of this study.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

6. Participation in this study has encouraged me to utilize Tabletop Simulator more in the future.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

7. I found the study website, prototypegamer.com, helpful.

①	②	③	④	⑤
Strongly Disagree	Somewhat Disagree	Neither	Somewhat Agree	Strongly Agree

### OPEN-ENDED QUESTIONS

Did you make use of the study website [prototypegamer.com](http://prototypegamer.com)? If so, what aspects of the site did you find most helpful? If we were to run the study again in the future, what changes would you recommend to make the study website more useful?

---

Did you make use of the design tool on the study website? How so? Would there be functionality worth adding to better assist board game designers in creating digital prototypes in the future?

---

Over the testing period, have you noticed any ways that your use of Tabletop Simulator has changed your perception of digital prototyping? If yes, how so?

---

---

Do you think you will be using Tabletop Simulator more in the future...for play-testing? ...for casually playing commercially-produced board games online? Why or why not?

---

Any additional commentary about Tabletop Simulator, the Drexel Study, or digital play-testing? (Optional)

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