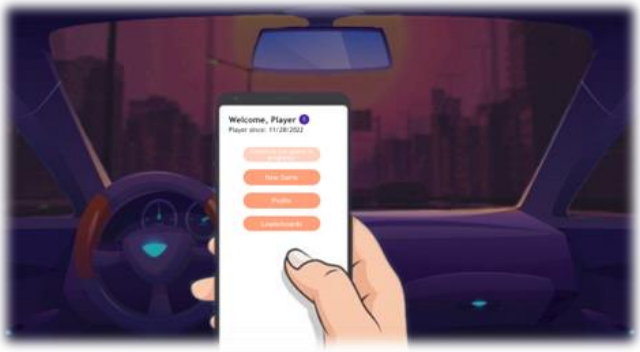

The Making of *Dystocity: Job Hunt*: An Interactive Meditation on Hyperconnectivity and its Discontents

by Fangtai Bao & Tim Drevitch

A Project Report

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APPROVED:

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Abstract

Dystocity: Job Hunt is an interactive, choice-driven serious game that delves into the potential impact of social media applications used in everyday life, and in particular, their potential harms when going through job interviews in an age of hyperconnectivity. It was initially created as a teaching tool for Professor Yunus Telliel's Technology Ethics classes, and later developed for use by all STEM-related graduate students. Doubling as a learning tool and an interactive experience, the game encourages players to not only make their own choices in order to reach diverse possible endings, but also to gain insight into topics such as the fear of missing out (FOMO) in social media and social media screening resulting from third-party platforms sharing private information using users' digital footprints. The primary goal of *Dystocity: Job Hunt* is to highlight the ethical challenges posed by social media in a digital hyperconnected world. It does so by introducing numerous moral dilemmas through the gameplay and permits the choices made to result in distinct endings, providing players with a broader perspective on relevant digital ethics concerns. The development of this interactive fiction involved a cycle of iterative prototyping and playtesting. Evaluation of test data and user survey results indicated opportunities to improve game narrative progression and design aesthetics.

Acknowledgements

Dystocity: Job Hunt was created by its developers Fangtai Bao and Tim Drevitch throughout 2022 and 2023, but it would not have been what it turned out to be without the exceptional dedication and guidance of Professor Yunus Telliel.

The two Thesis Readers, Professor Ben Schneider, and Professor Walt Yarbrough both joined the project midway through and were hand-picked by the developers purposefully because of their respective backgrounds and expertise. They offered their guidance and suggestions throughout the second half of the project and are both appreciated.

Lastly, without the help of a recently graduated Master's student, now a PhD student, Josiah Boucher, the developers would have been going into this project blind. Josiah sat through most meetings and offered advice and direction which was extremely appreciated, providing invaluable guidance based on his experience with this process the year before.

Thank You.

Contents

1. Introduction

Our graduate project began with the creation of a game as a teaching aid in the technology ethics classes taught by Professor Telliel. One such course is “Ethical Impact and Communication in Robotics and AI Research,” a graduate course designed by Professor Telliel to help graduate STEM students develop a critical understanding of emerging technologies. The students include Master's and Doctoral students from fields such as robotics engineering, mechanical engineering, data science, computer science, and interactive media and game development. While these graduate students excel in their technical fields, they often lack an awareness of the social implications. Therefore, Professor Telliel proposed introducing a game to help students reflect on key concepts in the course.

He initially asked our team to develop a game on smart cities. In the first phase of the design, our team surveyed published research on smart cities and identified the most common ethical issues. We decided to focus on the pervasiveness of data and the potential vulnerabilities that smart cities have and will continue to create.

Figure 1.1. Posters of *Black Mirror: Bandersnatch* (left) & *Beholder* (Right).

Source: Internet.

After determining our focus, the team proceeded to explore fundamental concepts in current research and games associated with data and the vulnerabilities it creates. We found a wealth of useful research items and comparable media, with the most inspiring examples being *Black Mirror: Bandersnatch* and *Beholder* (Figure 1.1). The balance of the former's choose-your-own-adventure (CYOA) interactivity and game narrative is one of the best current interactive media releases for inspiring reflection, while the latter was set in a dystopian setting and dealt with privacy concerns. Combining the two, our team decided to create a CYOA game that simulates data privacy concerns in a dystopian environment. It would showcase the potential dangers of this topic in a relatable, life-like, and entertaining story. Given that our target

audience was Professor Telliel's graduate students, and that social media is an integral part of modern life (especially for people of that demographic), we built the game narrative around data privacy concerns of social media platforms and related it to post-graduation job interviews.

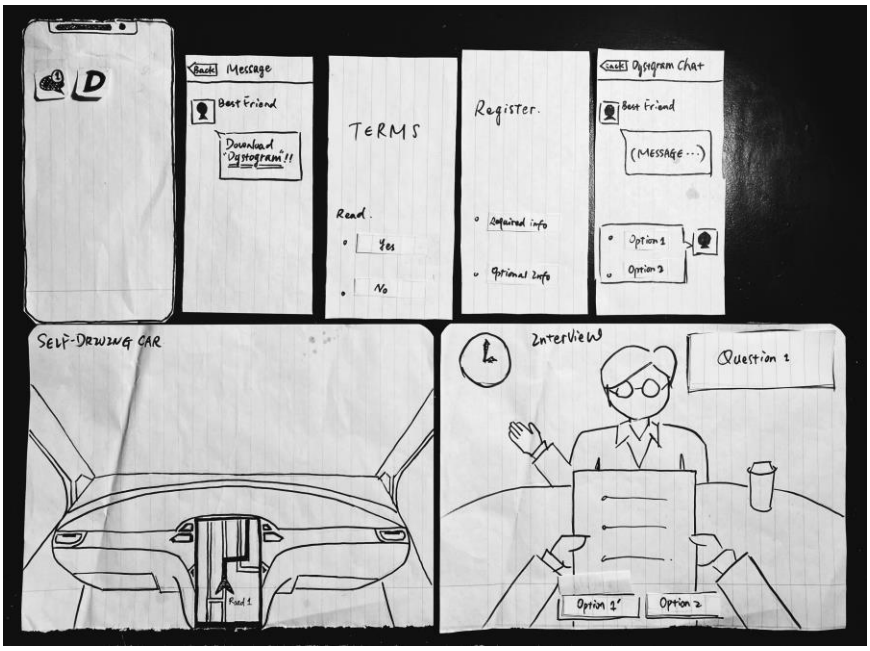


Figure 1.2. Paper prototypes. Source: Sketch.

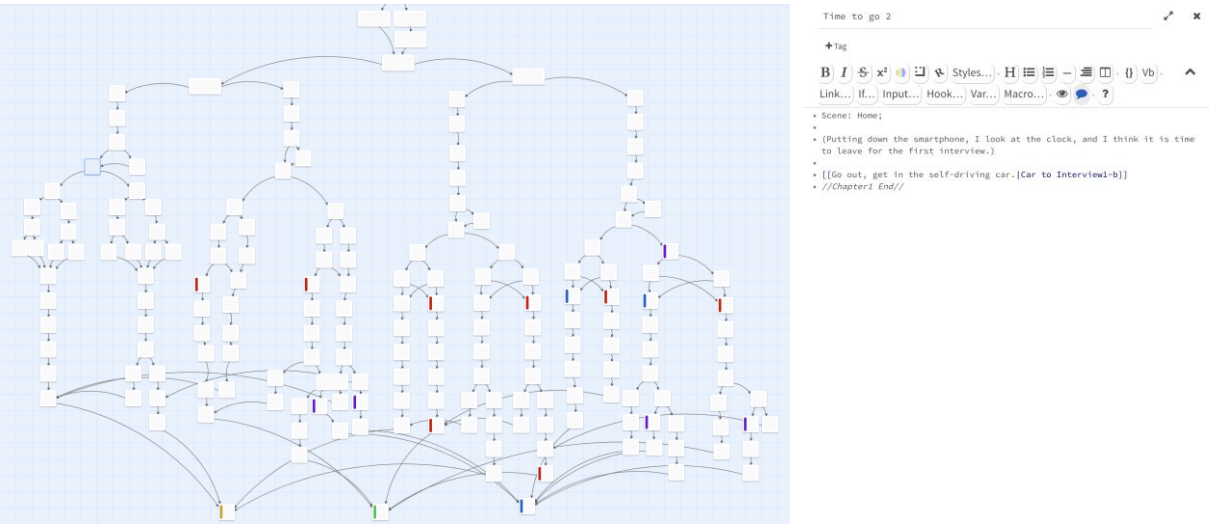


Figure 1.3. Narrative design. Source: Screen capture, Twine.

After creating a paper prototype (Figure 1.2) and the narrative design (Figure 1.3), Professor Telliel realized that our game could be more about digital hyperconnectivity and its discontents, which would make our project richer and more thought provoking. In response, we incorporated the core concept of "Fear of Missing Out" (FOMO) on social media in a hyperconnected environment into the game. This came through further team research and investigation and was able to strengthen our data privacy design narrative in a hyperconnected environment.

During the game's development, we created teaching guidelines to provide a way for Professor Telliel to use the game. In addition to specific methods for students to learn with the game, the guide also includes discussion questions, activities, and readings related to the game.

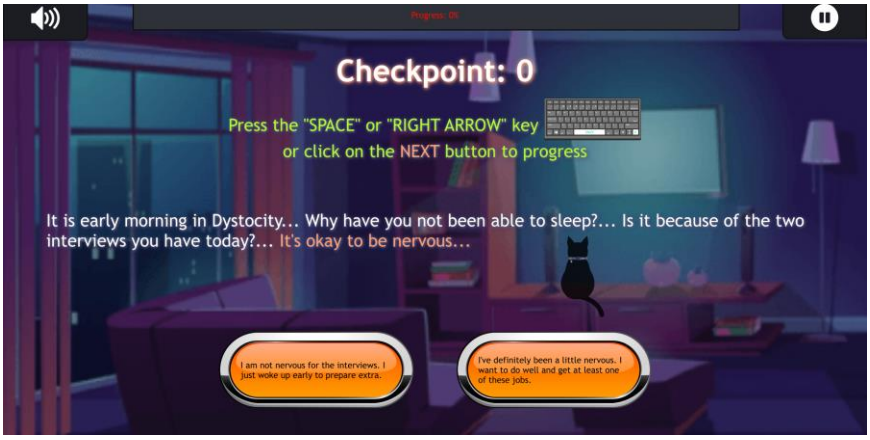


Figure 1.4. First version of *Dystocity: Job Hunt*. Source: Screen capture.

Upon completing the first version of the game (Figure 1.4), the team realized that our game could also be beneficial to a general group of STEM graduate students. We immediately conducted a round of mini playtests. We received positive feedback from testers who had experienced classroom instruction by a professor using the teaching guideline. However, general graduate student players encountered difficulties in forming connections between the concepts and the game's narrative.

To ensure that our game not only appeals to a broader range of graduate students but also serves as a more effective teaching aid, we updated our game in three steps. First, we examined the unique aspects of games as a medium and how they can be designed as teaching aids. This led us to an investigation of serious games as potential solutions. The one that helped us the most was "Persuasive Games: The Expressive Power of Videogames" written by Ian Bogost, published in 2007. Second, we refined our key concept. We came to understand that data privacy was not the most accurate concept for our project; instead, digital footprints were more suitable and relevant. As for the concept of FOMO, we delved deeper into its

characteristics and how it manifests itself. These gaming insights and conceptual additions were incorporated in the final step... the reshaping of the game narrative.

Figure 1.4. Second version of *Dystocity: Job Hunt*. Source: Screen capture.

In the second version of the game (Figure 1.5), we incorporated digital footprints and their vulnerabilities into our narrative design and strengthened the presence of FOMO in the narrative design. The results of the second round of playtesting were largely satisfactory. Although there is still room for improvement in terms of graphics, music, and game progression, players generally demonstrated a solid understanding of the game's purpose and were able to reflect and relate to their own lives, regardless of whether they were aware of the game's guidelines beforehand. This positive feedback encouraged and inspired us to continue with possible future work.

This report details the design process for *Dystocity: Job Hunt*. The *Conception* section addresses digital concepts relevant to this project and their ethical implications. In the *Critical*

Context section, we will first discuss the role of serious games in promoting student learning and raising social awareness. Then, we will discuss the games that primarily inspired our project to establish its relevance during the development of our project. The *Design* section is the description of the game as a whole and the details of the details of the scenes, characters and items in the game. The *Evaluation* section presents game test results, including charts and graphs compiled from objective data, as well as subjective feedback gleaned from survey responses. Accompanying this data is an explanation and analysis of how it can be used to further improve programming and narrative design in *Dystocity: Job Hunt.*

Lastly, the *Conclusion* considers the apparent strengths and weaknesses of the design of *Dystocity: Job Hunt* and identifies the main challenges faced throughout its development. By reflecting on these elements, we hope to refine and enhance the game's effectiveness as a teaching aid and broaden its appeal to a wider range of graduate students in STEM fields.

2. Conception

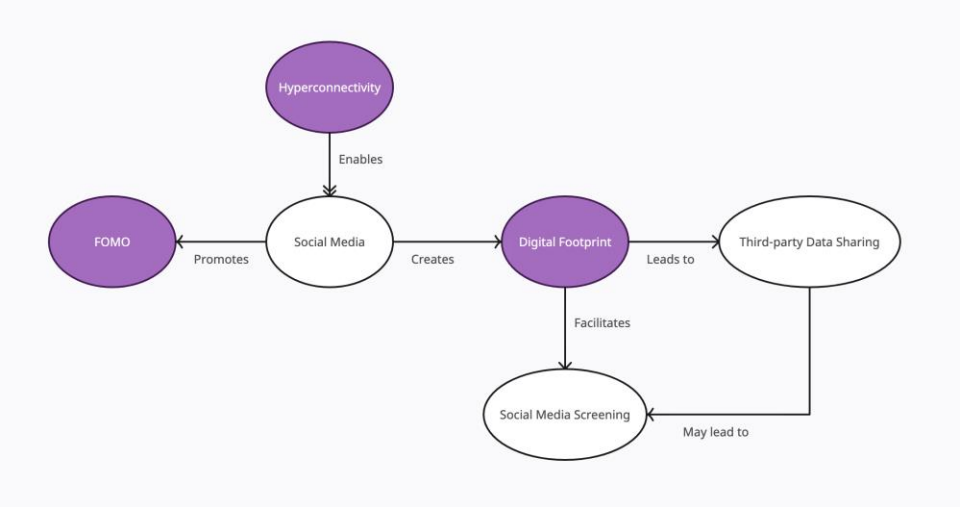


Figure 2.1. Concept Map. Source: Online drawing.

The project concept map (Figure 2.1) presents the key concepts of this project which include Hyperconnectivity, Fear of Missing Out (FOMO), and Digital Footprints. These interconnected concepts form the basis of the game's narrative, highlighting discontent with the hyperconnected era. Each concept will be explored individually, and their connections and potential ethical concerns will be discussed.

2.1. Hyperconnectivity and Social Media

Hyperconnectivity refers to a state of “connecting everyone and everything to everyone and everything else, everywhere and all the time.” In this concept, Brubaker (2023) argues the following:

> we are connected not only to (almost) everybody else and to an infinite universe of digital content, but also to an ever-denser network of material things. We inhabit not simply the Internet of Things, but the Internet of Everything (p. 1).

The emergence of digital hyperconnectivity in the early 2010s was driven by the widespread adoption of smartphones and further accelerated by the 2020 pandemic. The pandemic led to a massive shift to remote work, socializing, entertainment, education, shopping, and medical care, intensifying the digitization of social life and setting the stage for an even more hyperconnected future (Brubaker, 2023, p. 1).

Hyperconnectivity has contributed to the rapid expansion of social media platforms, with many having enormous user bases. Brubaker (2023) states the following:

> Nearly 3 billion monthly active users, WhatsApp, and Instagram over 2 billion each, Messenger 1.3 billion. In addition to Meta-owned apps, YouTube has 2 billion users, China's WeChat has 1.25 billion, and TikTok, founded in 2016, reached a billion users by 2021, almost all of them since 2018. Many people use more than one of these apps (p. 3).

Although there are some advantages to social media interactions including easy connections with friends, family, and new acquaintances, quick access to news and cultural content, the ability to bring people with diverse backgrounds together on common topics, and fostering community bonds (Brubaker, 2023, pp. 50-52), the following ethical concerns are worthy of reflection in the era of hyperconnectivity.

2.1.1. Fear of missing out (FOMO)

Fear of Missing Out (FOMO), which is one concern on social media ethics, is defined as pervasive apprehension that others might be having rewarding experiences from which one is absent. It is characterized by the desire to stay continually connected with what others are doing (Gupta & Sharma, 2021, p. 4882).

FOMO is a unique term introduced in 2004 and has been widely used since 2010 to describe a phenomenon observed on social media interactions as well as in other instances for which we are not concerned with in this project. FOMO includes two processes; firstly, perception of missing out, followed up with a compulsive behavior to maintain these social connections (Gupta & Sharma, 2021, p. 4882). Due to the vast number of social media users and the diverse content on these platforms, individuals who are doubtful about social media may still be influenced by their peers or environment, leading to a fear of missing out (FOMO) as they worry about not fully participating in the experience. Social media users experience even more increased anxiety about missing out on valuable information, which leads them to spend extended periods of time on these platforms engaging in various activities. They connect with others and share information in an effort to stay updated and involved as they fear being left behind in a rapidly changing digital hyperconnected era. This continuous engagement can result in an excessive use (and potential misuse) of social media, driven by the desire to remain informed and connected. However, our attention is never fully able to match the excessive amounts of information. FOMO has negative effects on psychology and physiology, such as anxiety or impaired physical and mental health, which affects our daily life (Gupta & Sharma, 2021, p. 4882).

2.1.2. Digital Footprint

A digital footprint pertains to the aggregation of data and information produced by individuals during their involvement in online activities (Dictinary.com, n.d.). It includes all residual traces that users leave behind while interacting with an array of digital platforms such as social media, websites, and mobile applications. About digital footprints, Professor Yarbrough states the following:

> "Datamining and assembling digital footprints for sale to advertisers and other databases is believed to be one of the consistently profitable areas of current social media companies. This creates a self-reinforcing loop of more coding time, and effort is devoted to data gathering and sales of personal data, regardless of purchaser intention. Further, given that many of these companies are not profitable, and profit driven, there is a consistent pressure to gather more data and capture more user time on these apps" (W. Yarbrough, personal communication, April 4, 2023).

Digital footprints can be primarily divided into two distinct types: active and passive (Madden et al., 2007). Active digital footprints emerge when users purposefully partake in online activities like sharing pictures, crafting comments, or distributing content across social media platforms. These actions are willful and demand the user's direct contribution in forming their digital presence. Active footprints showcase the individual's intentional online behavior and the digital character they wish to project.

On the contrary, passive digital footprints are generated without the explicit engagement or cognizance of the user (Rossi & Bigot, 2018). This type of footprint can encompass elements like private chat history, browsing patterns, or location data gathered by

various applications and services. Passive digital footprints are often an inadvertent byproduct of utilizing digital services, and users may remain unaware of the traces they leave behind. These footprints can reveal a more nuanced picture of a person's online behavior, including their preferences and habits that they may not actively share.

2.1.3. Social media screening

Social media screening typically analyzes active digital footprints. Employers, academic institutions, and other entities use these screenings to assess an individual's personality, behavior, and online presence. This can have significant consequences for job opportunities, college admissions, and even personal relationships.

Screenings involve analyzing the content people post, their online interactions, and self-presentation to gain insight into their character, values, and communication abilities. Organizations use this information to determine if a candidate is compatible with their culture, values, or expectations. However, inappropriate or controversial online behavior may hinder a candidate's chances of obtaining a job or being accepted into an academic institution (An HR Glossary for HR Terms, n.d.).

Despite offering valuable insight into an individual's online behavior, social media screening raises privacy and fairness concerns. Individuals may feel their personal lives are invaded or that they are being judged unfairly based on their online persona. Moreover, there is a risk of information being taken out of context or outdated content leading to inaccurate conclusions about a person’s character (Stop Screening Job Candidates’ Social Media, 2021).

2.1.4. Third-party data sharing

Third-party data sharing is the process in which a platform or service provider shares or discloses user information to external entities or third-party organizations. This practice is common among social media platforms, websites, and various digital services that collect and process user data. One reason that companies may share user data with third parties is for business partnerships, which means platforms may share user data as part of business collaborations or agreements with other companies to develop new products or services that benefit both parties. So, when passive digital footprints are made available or sold to third parties, such as employers, they may use the data to conduct more private research on candidates, which can lead to ethically questionable social media screening practices, resulting in significant legal or ethical consequences.

This form of data sharing raises concerns about user privacy, as passive digital footprints may contain sensitive information that individuals have not actively chosen to share. Furthermore, third-party data sharing of passive digital footprints can contribute to a loss of control over one's online identity, as individuals may not be aware of or consent to how their information is being used or shared. Insufficient transparency may result in the possibility of being misrepresented, which can negatively impact an individual's chances in a job or educational pursuits.

3. Critical context

Reflecting on the distinctiveness of games and recognizing the role of serious games in promoting student learning and social consciousness helped maintain focus in our game development process. Simultaneously, the games that initially inspired our project have provided valuable insights regarding genre, narrative, and gameplay, contributing to the evolution of our project.

3.1. Gaming

Gaming, in contrast to books or movies that offer a linear entertainment experience, is characterized as a problem-solving activity, approached with a playful attitude (Schell, 2019, p. 48). Games underscore the distinction between tangible products and interactive experiences, rendering them more captivating and invigorating when compared to books or movies.

This distinction is crucial because it enables players to immerse themselves in the game world, actively mold their own narratives, and develop a deeper connection with the content. As a result, gaming offers a unique level of engagement and thought-provoking experiences that traditional media formats often cannot provide.

3.1.1. Serious Game

Serious games are designed primarily for purposes other than pure entertainment. Ian Bogost, a renowned video game designer and scholar, is the most inspiring person for us to

reflect on this type of game. He emphasizes the potential of serious games to engage players with complex problems, offering a unique, interactive, and immersive approach to understanding and reflecting on these issues. By carefully designing and developing captivating serious games, Bogost posits that we can revolutionize the way people engage with and reflect on the challenges that shape our world. His work underscores the value of harnessing the engaging nature of video games to facilitate deeper insights and promote constructive dialogue.

In his influential book, *The Persuasive Game: The Expressive Power of Video Games*, Bogost ardently advocates for the use of video games as potent persuasive tools that can educate players about crucial social and political matters. Persuasive game is a type of game explicitly designed to communicate social or ethical issues to players through gameplay, narrative, and design elements. Its goal is to influence players' perspectives, beliefs, or behaviors by immersing them in a thought-provoking and interactive environment. Persuasive games employ various techniques to influence players, such as emotional narratives, fostering empathy, and presenting ethical dilemmas.

Procedural rhetoric, a term coined by Bogost in *The Persuasive Game: The Expressive Power of Video Games*, is intimately connected to persuasive game, as this type of game frequently depends on procedural rhetoric to effectively communicate its intended idea or concept. According to Bogost, procedural rhetoric is the concept that a game's interactive systems and mechanics are intentionally designed to represent or simulate real-world processes, phenomena, or ideas. Engaging with these systems allows players to gain a deeper understanding of the concept or issue being addressed. Procedural rhetoric extends beyond

individual aspects of a game, such as its narrative or visuals, and highlights the gameplay itself as a means of presenting persuasive arguments or communicating specific messages (Bogost, 2010).

Considering Bogost's theory of persuasive game and procedural rhetoric, our team has refined our game design approach. While we continue to polish our narrative and visual effects, we are focusing on creating more relatable questions and answers as well as moral dilemmas through game rules and gameplay, specifically by creating branching checkpoints.

3.2. Reference Games

During the initial phase of project design, we explored and analyzed a wide array of games to draw inspiration for genre, gameplay, or narrative design. These included *Sim City*, *Monopoly*, *Fallout 3*, *Civilization V*, *The Witcher 3*, *Mass Effect*, *The Witness*, *Portal*, T*he Walking Dead*, *GTA*, and *Life is Strange*, among others. Each game provided unique insights. However, the following two games were particularly influential in shaping our project.

3.2.1. *Black Mirror: Bandersnatch*

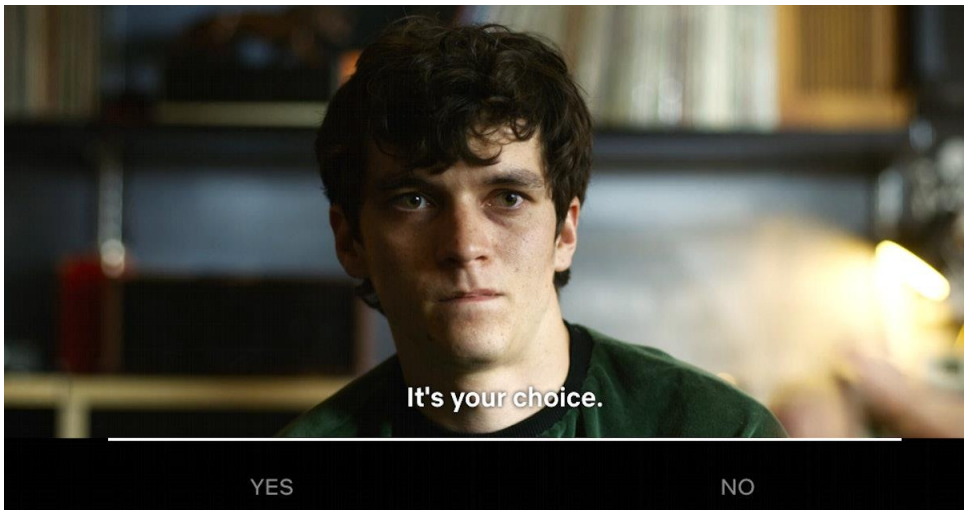


Figure 3.1. Game capture of *Black: Bandersnatch*. Source: Internet.

In the game genre, the most prominent influence for the project is *Black Mirror: Bandersnatch* (2018) (Figure 3.1), an interactive episode on Netflix. *Black Mirror: Bandersnatch* is set in 1984, it tells of a computer programmer trying to adapt a fantasy novel into a video game. Viewers must make the lead character's choices for him - decisions that send the plot in different directions (Bandersnatch: The critics' verdicts on Black Mirror's interactive adventure, 2018).

Black Mirror: Bandersnatch can be understood as a choice-based interactive game, also known as choose your own adventure (CYOA). IFWiki (2022) defines CYOA as follows:

> The game is assembled from a set of story nodes and related choices. A typical turn in CYOA will consist of a passage of text describing the current situation of the game and followed by a short list of explicit options to choose from. When the player selects a

choice, the story continues with a new section of the story, which offers new options. This mode of play, moving from one story node to another, continues until one possible ending is reached.

However, unlike some other CYOA games, *Black Mirror: Bandersnatch* offered our team an inspiring experience in several ways. First, *Black Mirror: Bandersnatch* seamlessly integrates choices into the story, maintaining immersion and narrative flow. Unlike some other CYOA games' choices are just arbitrary forks in the road, *Black Mirror: Bandersnatch* incorporates choices that feel meaningful and connected to the plot. This fosters an immersive and engaging experience, with players actively participating in shaping the story's endings.

Second, *Black Mirror: Bandersnatch*'s multiple endings and story paths enhance the experience by offering players a broad scope for exploration, which increases the story's replay value. The decisions players make directly influence the narrative's progression and final ending, encouraging them to think about the potential consequences of their actions. With numerous branching paths and endings, it invites the players to explore various storylines and experience a wide range of possibilities. This encourages repeated play and prompts players to reflect on their choices and consider potential endings, adding an extra layer of depth to the experience.

Moreover, *Black Mirror: Bandersnatch*'s executive producer, Annabel Jones, believes that the interactive elements of episode foster an emotional connection between the players and the characters, allowing players to experience the character's emotional journey (Bandersnatch: The critics' verdicts on Black Mirror's interactive adventure, 2018).

Drawing from our experience with the episode and Annabel Jones' perspective, we concluded that *Black Mirror: Bandersnatch* 's approach to CYOA could deliver a sense of immersion while maintaining a smooth narrative flow. The impactful choices and multiple story paths leading to varied endings increase the value to replay. We believe that the experience provided by Black Mirror aligns with our project's goals, as it encourages players to engage in reflection after their gaming experience. This reflective value is consistent with our design goal: to prompt players to think critically about the game's characters, their choices, and the potential consequences of those choices. By encouraging players to reflect on their decisions and how they impact the story, players can have a deeper understanding of the game's purpose - the specific issues of social media in the digital hyperconnected era. Furthermore, *Black Mirror: Bandersnatch*'s success in creating an emotional connection between the players and the characters demonstrates the potential for interactive storytelling to elicit empathy and foster a more profound engagement with the narrative. By incorporating these elements into our project, we hoped to create a similarly immersive and thought-provoking experience that allows players to explore complex themes, question their own decision-making, and ultimately apply reflections from experience to real life.

3.2.2. *Beholder*

Figure 3.2. Game capture of *Beholder.* Source: Internet.

In terms of game narrative design, although there is no reference that is completely consistent with our game concept, *Beholder* (2016) (Figure 3.2) has provided us inspiration to a certain extent. The game is set in a grim dystopian future society. In here, a totalitarian state controls every aspect of private and public life. Surveillance is total, and privacy is dead. The player is the state-installed manager of an apartment building. His daily routine involves keeping the apartment building in harmony. However, he needs to monitor his tenants, search, and report their violations (Beholder: Every Choice Has Consequences, n.d.).

In addition to every decision having an impact on the direction of the story, *Beholder* has two points that provide the project a lot of inspiration. For one, *Beholder* is a game about privacy. Although it is different from the digital footprint on social media in our project, the

different results and impacts that may be caused by the collecting of personal data offer us a lot of room for thinking.

For another, the game world of *Beholder* is set in a dystopian society, which greatly inspired us. As defined by the Merriam-Webster dictionary,

> Dystopia: of, relating to, or being an imagined world or society in which people lead dehumanized, fearful lives (Merriam-Webster, n.d.).

The term characterizes a situation that starkly contrasts with an ideal society, embodying extremely negative and undesirable consequences. Dystopian scenarios often delve into themes such as social injustice, totalitarianism, and the repercussions of technological advancements. Our game's dystopian background draws inspiration from the negative aspects of social media issues in the era of digital hyperconnectivity. To help players connect the game's purpose to daily lives, it is not set in a conventional dystopian society, but rather incorporates the core elements of the extremely adverse situation stemming from these problems.

The dystopian setting of the narrative and environment include the magnification of social media issues, creating a tense and antagonistic atmosphere for players. This context encourages players to contemplate these issues and strive for a positive resolution, illustrating the possibility for change even in the bleakest of situations. The importance of situating our game in such a setting is that it enables players to engage with the consequences of digital-age issues, fostering reflection and problem-solving abilities. By immersing players in severe social media issues, the game urges them to reflect on the connection between the game's progression and endings while connecting these experiences to their daily lives.

4. Design

Dystocity: Job Hunt is as much a game as it is a teaching tool. We had clear goals while making this game. Playing through this game would give players a chance to experience a realistic situation that could happen to them. Because of the nature of this being a game with no real repercussions, the player could make their own informed decisions and immediately see the outcomes of their actions and choices. We provided a story that, although fictional, could be something that could happen in the real world. We found that a good example to follow this logic would be for us to have the main character be a recent college graduate searching for their first real job.

Dystocity: Job Hunt, a choose-your-own-adventure (CYOA) genre game, aims to make players critically reflect on the impact of social media issues in the era of hyperconnectivity on everyday life. The game adopts a first-person perspective and is set in *Dystocity*, a futuristic city set in the year 2040. Throughout the game, it is not specifically stated that the setting is in the future, but small parts of the game hint to it. In the game, the protagonist prepares for the opportunity to participate in two interviews. As the game progresses, the player goes to each interview and eventually finds out if they will get a job offer. During the preparation, the player will be "convinced" by their best friend Allen in the game to download Dystogram, which is a social media app. The interaction between the player and the social media app will have a crucial impact on the interviews and results in the end.

Based on options throughout the game, the protagonist can make choices that affect the way the story plays out and what type of ending the player reaches. Many of the choices throughout the game involve opportunities for the player to be smart with what they share online. For instance, sharing too much personal information on the social media app Dystogram changes how the interviewers act in the interviews. It can even lose the player an opportunity to succeed in the job interviews. Interviewers with different information will ask players different questions based on the information. Finally, depending on the player's choice of options for different interview questions, they will get one of three possible endings.

In the story, players play as a recent college graduate. This graduate has two jobs lined up for the day. They start at home, make their way to each interview one by one, and then return home. In the morning, they find out which jobs they got (if any). The player uses a social media app during the story that ends up playing an essential role in the way the story plays out. Throughout the game, the choices that the player needs to make determine which jobs they get using some conditional code running in the background. An example of a decision in the game that the player needs to make is whether they decide to post about their art skills or not on the social media app. In the first interview, the interviewer may ask the player about their art skills and if they would be willing to apply for a graphic designer position. If the player chooses to not post anything about their artwork or about anything else personal, then the interviewer never strays from talking about the job that the player originally applied for. This ends up being one of many factors that help decide which jobs the player gets. Some other choices include choosing whether to read the terms of service in depth or not, choosing whether to read certain news articles in the app or not, choosing whether to create a social media post at the

end of their day or not, and some smaller decisions that the player needs to make in response to the interviewers' questions and statements. At the end of the game, our program decides which ending the player should get. First, we determine which jobs the player got. Next, we decide which ending they get. Getting neither job awards them with the worst ending, getting one out of the two jobs gives the player the average ending, and getting both jobs gives them the best ending.

```
const interview1: boolean =
  !game.postedAboutArt && game.readTerms && !game.postAboutInterviews;
const twoOutOfThree: boolean =
  !game.commentIncludesInterviewCount &&
  game.viewedCompanyBeef &&
  !game.askedAboutSearch;
const interview2: boolean = twoOutOfThree;
```

```
You got the{" "}
{!interview1 && !interview2 ? (
  <RedSpan>WORST</RedSpan>
) : !interview1 || !interview2 ? (
  <OrangeSpan>AVERAGE</OrangeSpan>
) : interview1 && interview2 ? (
  <GreenSpan>BEST</GreenSpan>
) : null}{" "}
ending!{" "}
{!interview1 && !interview2 ? (
  <RedSpan>Neither interview gave you a job offer.</RedSpan>
) : !interview1 || !interview2 ? (
  <OrangeSpan>One interview gave you a job offer.</OrangeSpan>
) : interview1 && interview2 ? (
  <GreenSpan>Both interviews gave you job offers!</GreenSpan>
) : null}{" "}
```

Figure 4.1. Code examples of the game's ending logic. Source: Our code repository.

```
<CheckpointButton
  style={{
    float: "left",
    width: "40%",
    height: "130%",
    fontSize: ".9vw",
    padding: "0 3.5em",
  }}
  onClick={() => nextCheckpoint(false)}
>
  "For now, I choose not to include my artwork in my profile."
</CheckpointButton>
<CheckpointButton
  style={{
    float: "right",
    width: "40%",
    height: "130%",
    fontSize: ".9vw",
    padding: "0 3.5em",
  }}
  onClick={() => nextCheckpoint(true)}
>
  "I am going to add one of my drawings to my profile."
</CheckpointButton>
```

```
 const nextCheckpoint = (postedAboutArt: boolean) => {
   let data = { postedAboutArtChoice: postedAboutArt };
   axios.put(`${url}/nextcheckpoint/${game._id}`, data).then(() => {
     setRender(!render);
   });
 };
```

```
//update game to new checkpoint
router.route("/nextcheckpoint/:id").put((req, res) => {
  Game.findById(req.params.id)
    .then((Game) => {
      Game.checkpoint = Game.checkpoint + 1;
      if (req.body.postedAboutArtChoice !== undefined) {
        // done
        Game.postedAboutArt = req.body.postedAboutArtChoice;
      }
      if (req.body.viewedCompanyBeefChoice !== undefined) {
        // done
        Game.viewedCompanyBeef = req.body.viewedCompanyBeefChoice;
      }
      if (req.body.readTermsChoice !== undefined) {
        // done
        Game.readTerms = req.body.readTermsChoice;
      }
      if (req.body.commentChoice !== undefined) {
        // done
        Game.commentIncludesInterviewCount = req.body.commentChoice;
      }
```

Figure 4.2. Code examples of the game's decision-making logic. Source: Our code repository.

Pictures 1 & 2. Code for the two buttons and the API call sending the choice to the server to save.

Pictures 3 & 4. Code on the server that saves choices throughout the game.

4.1. Endings

When the player reaches the end of the story (Figure 4.3), they will receive one of three conclusion messages (worst ending, average ending, or great ending). Although this seems to be random at first, it is not. Under the hood, our game gathers all of the decisions that the player made and calculates how those decisions would have impacted the interviews. Players can finish the game having received no job offers (worst ending), one out of the two job offers (average ending), or both job offers (great ending). The player is then given the opportunity to also reflect on the choices they made throughout their playthrough. They can always play again

after and see if they can get a better ending on a second playthrough by making different choices.

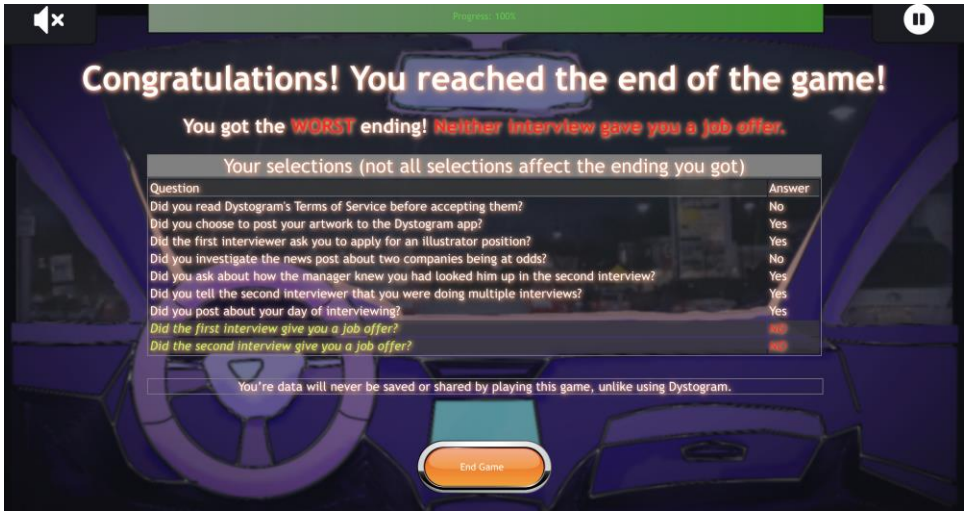


Figure 4.3 Game ending is reached. Source: Screen capture.

4.2. Characters

- **The Protagonist** - the main character of the game. Players that sign up to play this game can choose their own "player name" which can be seen on the leaderboards. The player name is used throughout the game when other characters communicate with the protagonist. The main character appears from a first-person perspective. They have just graduated from university with a major in computer science with outstanding programming ability. At the same time, they also have generally good drawing/artistic ability. However, social skills are their shortcoming, and they rarely use social media

applications to share about their personal life. All the mentioned characteristics will be key to the story and thus affect the direction of the game process.

- **Allen Jacobs -** the NPC throughout the game, and the best friend and classmate of the protagonist. He also represents Fear of missing out (FOMO) in the game. He "convinces" the protagonist to download the social media application Dystogram. He is always telling the player how good the social media app is and tries getting the player to continue to keep checking it and using it.
- **Interviewers** – although there are two separate interviews with two separate companies, the interviewers in this game are unnamed and act very similar. The first one seems to have looked out your profile online, while the second one seems to have been given private data from the app.

4.3. Items

- **The Smart Phone** - the protagonist primarily communicates with his friend and interacts with the social media app using their smart phone.
- **Dystogram -** the social media app that the protagonist uses throughout the game.
- **Self-Driving Car** - the protagonist gets around the city using their self-driving car.

4.4. Scenes

- **Home** - the protagonist starts their journey in their own home. Eventually they leave for the interviews and don't return there until the conclusion of the story.
- **Self-Driving Car** – the inside of the car is where a lot of the story takes place. Often (because the car drives itself) the player is able to talk with Allen or go on the social media app between interviews while on the road.
- **Interview Room(s)** - the two interviews take place in an interview room. This is where the protagonist completes their two interviews.

4.5. Rules

The rules of *Dystocity: Job Hunt* are based on the CYOA genre requirement. The player presses the "next" option to move through each story checkpoint. Each checkpoint has a definitive end. When the end is reached, the player then presses a button to bring them to the next checkpoint in the story. Normally there will be one button that brings the player to the next checkpoint, but sometimes there will be multiple buttons. The player must press no more than one button to bring them to the next checkpoint (whether there are multiple options or not).

There are twenty-five checkpoints in total. When the player reaches the final checkpoint of the game, they will discover one of three unique endings. The ending the player arrives at

will correspond with the choices that they made based on the reading and analysis of the game narrative throughout each of their playthroughs. Each time a player finishes a game, the game saves a new playthrough to the player's account. The player's choices in the game are then deleted. Players can view the global leaderboard to see how many playthroughs they have compared to their peers. No personal data is saved in this game except for the player's email, playthrough count, and current player name (player names can be changed at any time and cannot contain profanity).

4.6. Extras

- **Sign in/Sign up** – players must sign into our game in order to play it. We purposely do not want to save player data, especially passwords and personal information. We only have the player sign up using any Google account of their choice. This allows us to authenticate the user and sign them in without having to save their information.
- **Player Names** - when a first-time user signs up, they are asked to provide a Player Name. This can be anything they want it to be, but it is worth noting that the program does not allow the player to enter profanity as their Player Name. It is also worth noting that this Player Name is used in the actual gameplay when people in the game talk to the protagonist.
- **Leaderboards** – there is an entire page of this app that allows players to see others' high scores. This is not that in depth. It shows how many playthroughs each player has

completed. The table only shows the top ten players and does not show anyone's real names unless they choose to make their Player Name their real name.

Figure 4.4. Game leaderboards. Source: Screen capture.

- **Game Saving** (Figure 4.4) – this game saves the player's progress throughout each playthrough. Each playthrough consists of 25 checkpoints. The game's state is saved at the end of each checkpoint. This means that the player is able to press the pause button, open the pause menu, quit to main menu, and keep their progress saved. The Continue button at the main menu can be used to continue playing a game that was already in progress. The save functionality is automatically in effect, meaning that if the page is refreshed or closed, the player is still able to continue where they left off. At the

very end of a playthrough, all of the saved data gets deleted. We do not want to be saving any user data that we don't need to be saving.

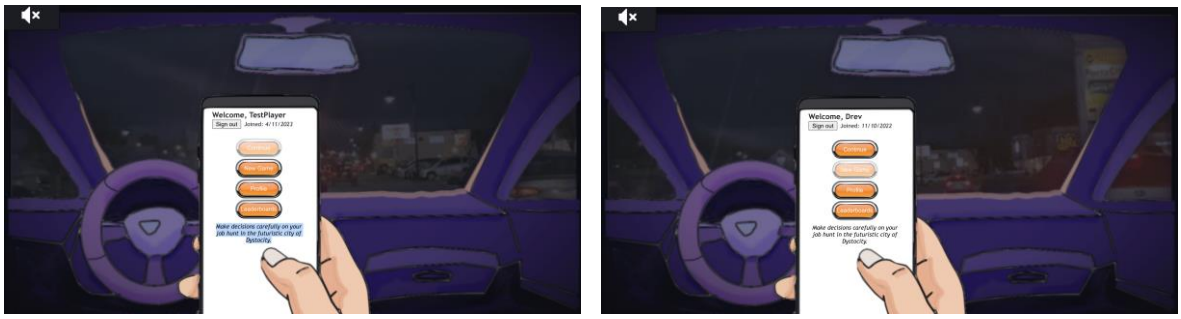


Figure 4.5. Game state for starting or continuing a game. Source: Screen capture.

4.7. Functionality

Rather than creating a story that branches, we opted to create a linear story that renders different text on the screen depending on the player's choices. If we were to build a branching narrative, it would have taken double or triple the time and effort to make the story. Not only would it have taken longer, but it would have made it much more difficult for us to update the story if we wanted to. The game has the same twenty-five checkpoints in the same order every playthrough, but each time, depending on the choices the player makes, the text on the screen will be different.

5. Technology

5.1. Team

The team consists of Fangtai Bao (IMGD ’23) and Tim Drevitch (IMGD ’23). We have been working on this game since the beginning of Fall 2022. The project development has been mostly separated to ensure that we are both contributing our personalized skills efficiently. The roles are primarily split up into production, hosting, authentication, and development for Tim and story, audio, assets, wireframing, and quality assurance for Fangtai.

5.2. Platform

Dystocity: Job Hunt is hosted on a website (https://data-ethics-game.herokuapp.com). We planned on changing the URL to something much better such as *dystocity-job-hunt.com*, but it is already costing us around $14/mo to host this web application online and changing the URL would be adding to that significantly. During our pre-production research, we found that games built for mobile are becoming the most successful and profitable, even over console games. This seems to be mostly because of the convenience and availability of games playable on these devices. With our game being its own website, we figured that we could cover the most ground. Not only is this game playable on mobile devices from this website, but it also can be played from that same website on any computer, tablet, or even console (Figure 5.1) just by visiting the correct URL.

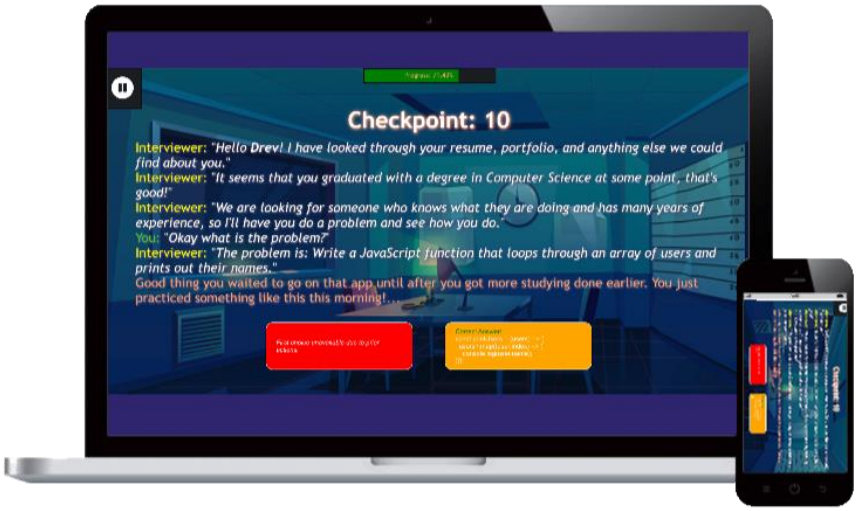


Figure 5.1. Game on desktop and mobile devices. Source: Screen Capture.

5.3. Technologies

We have used a large amount of popular and helpful technologies to put this project together.

For Development: For storing our code and assets, we have been using GitHub. The repository to our project can be found at (https://github.com/timdrevitch/data-collection-ethics-game). For hosting the website and the server for our game and for CI/CD, we are using Heroku, a platform built on top of AWS. To store data, we chose to use MongoDB Atlas for our designated database. MongoDB is a NoSQL nonrelational database storage option that allows us to store our data (for players and games) in JSON format very easily --- especially with the usage of Mongoose. The tech stack that we decided to work with is the MERN stack (Mongo Express React Node). This means that our frontend framework is React.js (a JavaScript framework/library that is great for building dynamic single-page web applications). Our

backend/server is using JavaScript as the language thanks to Node.js and is using Express.js for the framework. For our rest API calls, we are using the Axios NPM package and Insomnia for API testing. Other NPM packages we have included in our project include react-router-dom (for routing pages and navigation), concurrently and nodemon (both for testing in development), ordinal (for formatting numbers), react-icons (for symbols), styled-components (in place of CSS), cors (for security), dotenv (for hiding sensitive passwords and ports from GitHub), typescript (for added type-safety), bad-words (for ensuring that player-entered names do not include profanity, react-oauth/google (for using Google's API to sign up and sign in users, and jwt-decode (to decode JWT tokens). Google Cloud Platform and its API has been used to build the sign in/sign up system and to allow users to be allowed to visit the website as testers. The list of technologies we incorporate is growing every day.

Figure 5.2. Some software technologies used. Source: Photoshop.

For Audio and Art Assets:

- **Scene backgrounds.** The sketch design and creation were hand-drawn by the Procreate application on iPadOS. As the game was iterated and playtested, these sketches were colored and polished into vector illustrations, which were done on Adobe Illustrator. Eventually, we remade all of the artwork to improve it overall.

- **Items.** Some items included the appearance of the smartphone, the social media application's multiple UI states, and even a cat in the background. The former was created by Adobe Photoshop. The latter, that is, UIs of the "Messages" and "Dystogram" is completed by Adobe XD (also known as Adobe Experience Design).
- **Final artwork.** We were able to put together final artwork using programs and software such as Inkscape, Pixlr Photo Editor, EzGif, etc.
- **City cars.** We captured videos of vehicles driving along a road in Worcester and converted the recording into a gif to give the illusion of the self-driving car driving the protagonist around.
- **Fun fact.** The cat in the background of the game in some scenes is a transparent gif that looks exactly like Tim's cat in real life.

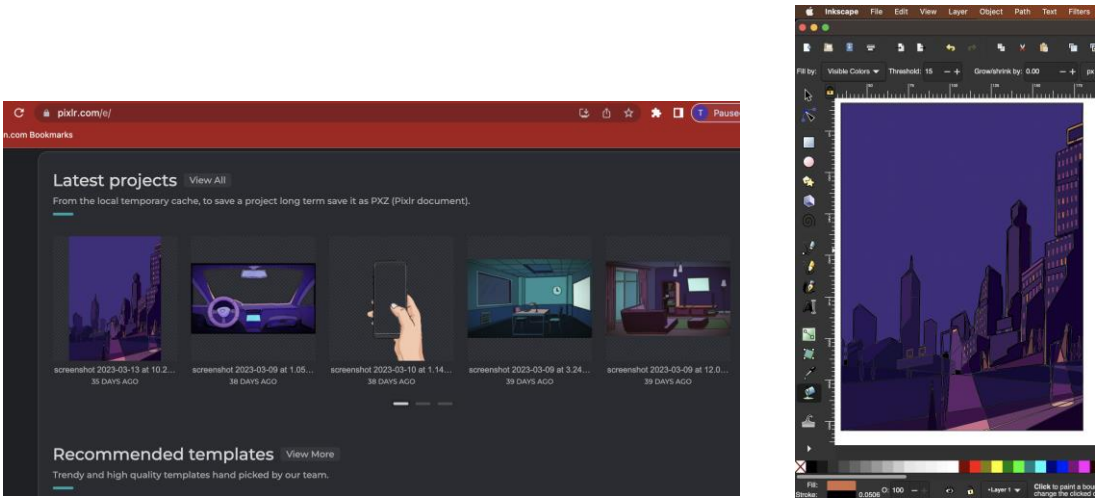


Figure 5.3. Inkscape and Pixlr Photo Editor. Source: Screen capture.

Figure. 5.4. Cars in Worcester. Source: Recording.

Audio assets. They, namely background music and game SFX, were obtained from the online resource website, and edited with Adobe Audition.

For Team: We have been using shared drive folders and One Drive Word documents for building out our projects timeline, story, and other collaboration (along with Discord occasionally). We also have used Miro and Twine for wireframing and story building. We use Zotero for sharing our resources and their citations. The repository is stored on GitHub (https://github.com/timdrevitch/data-collection-ethics-game).

Figure 5.5. Some software languages used. Source: Photoshop.

For Programming: We are using a variety of different programming languages to build our game. For the client/frontend of our application, we use HTML, CSS, JavaScript, TypeScript, JSX, TSX, yml, and JSON. For the server/database/backend, we use NodeJs (JavaScript) and JSON/BSON. We are also using different languages to interact with GitHub, Heroku, and our local repository like JSON, MarkDown, and Bash/Shell Scripting.

5.4. Asset creation

Given that the project is a choice-based interactive fiction type of game, and its purpose is to enable players to reflect critically about the impact of social media data issues in the digital hyperconnected era, the story and narrative itself should be the focus of the project. So, the assets are only to provide visual effects and play an auxiliary role in the game experience. Based on the above ideas, the art assets used simple 2D vector illustrations to depict the scene where

the story takes place and the items used by the character, such as the interview scene, smartphone, and application UIs. The sketch of the scenes and the smartphone with its UI have been obtained, and the final illustrations of the scenes were completed with the iteration and playtesting of the game. Later in the process, we ended up using programs like Inkscape and Pixlr Photo Editor to recreate these art ideas.

5.5. Timeline

[oct21-oct27]	Development Timeline Creation
	Paper prototype/technical prototype
	Research/Comps/Story rough draft
[oct28-nov3]	Create repository/Initialize project
	Create Client/Server/Database/API
	Asset list/Story work
[nov4-nov10]	Title Screen
	Login/Sign Up/Title screen
	Host website for testers
	Assets and Story work

[nov11-nov17]	Context/Data Modelling
	Stats Page/Leaderboards page
	Assets and Story work
[nov18-nov24]	Chapter 1 development
	Proposal Draft 1
	Assets and Story work
[nov25-dec1]	Chapter 2 development
	Proposal Draft 2
	Quality Assurance
[dec2-dec8]	Chapter 3 development
	Bug Fixes/Refactoring
	Quality Assurance/Testers
[dec9-dec15/Winter Break]	MVP/RC
	Reach out to Readers
[jan1-jan20/Winter Break]	Human Subjects in Social and Behavioral Research - Basic/Refresher Certification
[jan21-jan31]	Proposal Presentation
	Meet and discuss with Readers
[feb1-feb7]	Bug fixes
	UI updates
	Round 1 Playtesting

[feb8-mar1]	Playtesting Round 1 analysis
	Story Rewrite Ideas/Goals
	Story/tech skeleton
	Bug fixes/refactoring
[mar2-apr1]	Redo all art assets
	Story Rewrite Ideas/Goals + Research
	Define project goals
[apr2-apr7]	Rewrite story from scratch
	Add new story to codebase
[apr8-apr14]	Playtesting Round 2 – First Half
	Last code changes
[apr15-apr20]	Create Teaching Guide
	Playtesting Round 2 – Second Half
	Playtesting with IMGD classes + Teaching Guide Feedback from students
	Playtesting analysis
	Create Presentation
[apr21, apr26-apr28]	Presentation Day
	Show Fest
[apr27]	Final Report

6. Evaluation

How did we know if we were convinced that we had achieved our project's goals or not? To start, we combined all of our ideas together and condensed them into four concrete responsibilities that we felt the game needed to fulfil in order to be called a success. These four goals were related to the game's functionality, topics, accessibility, and teachability.

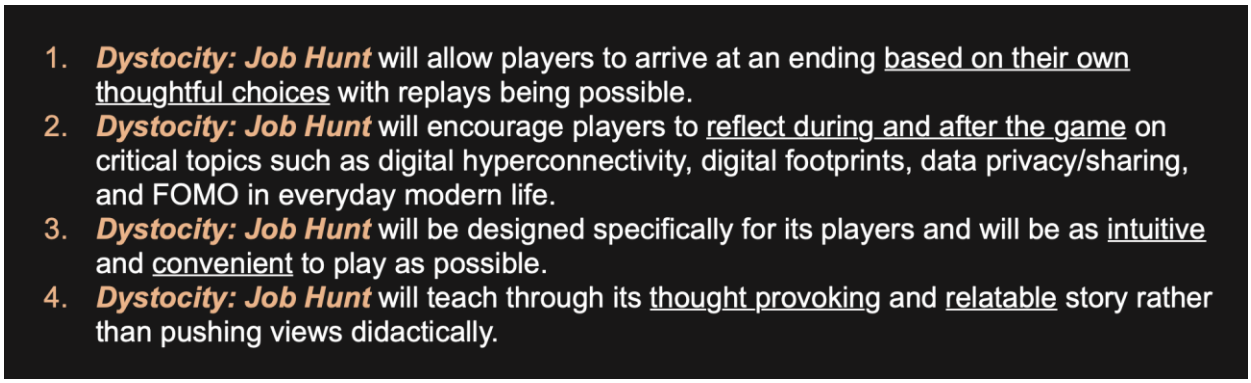


Figure 6.1. Project goals. Source. Screen capture.

6.1. Playtesting Goals

Our goal during playtesting was to get the most helpful feedback possible. To do this, we had to try getting as many testers as we could to lower the chances of getting incorrect data because of only having outliers test the game. We also wanted to keep our testers fresh and from our target audience. This meant that we would not be having testers retest the game after the first time they tested (other than a select few) and that we would be testing mainly

graduating undergraduate and graduate students. Recent graduates were allowed to be included as well. With the game being meant to be a teaching tool as much as an entertainment, we decided to focus both the story and the playtesting toward this demographic. Many of our testers ended up being IMGD or CS majors. To get the most accurate playtesting results we could, we used as many different methods as we could. This was primarily because we wanted to find out as much about our game as possible. If we only used a single method, we might have missed out on some valuable playtesting results. The main method we used was having players play the game and then take a post-play survey. Other methods included teaching exercises with feedback, monitored playtesting, and non-survey questions. Lastly, we ended up having a couple classes playtest the game. We provided two of these classes with the teaching guideline document in order to see how it worked and if we could get good feedback on it from them.

6.2. Playtesting Methods

The surveys had quantitative questions ("choose-between-1-and-6" questions) and qualitative questions (open-ended questions). We intentionally had our quantitative questions be on a scale from 1-6 rather than 1-5 so that we could avoid having players respond with the middle option every time. In this method of playtesting, we needed to get certified to be allowed to run safe playtesting. We spent a good amount of winter break going through the CITI program and getting our certifications in Human Subjects in Social and Behavioral Research - Basic/Refresher Certification.

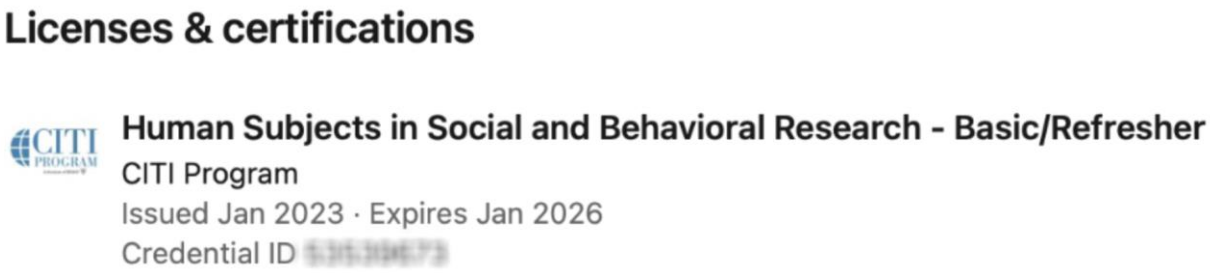
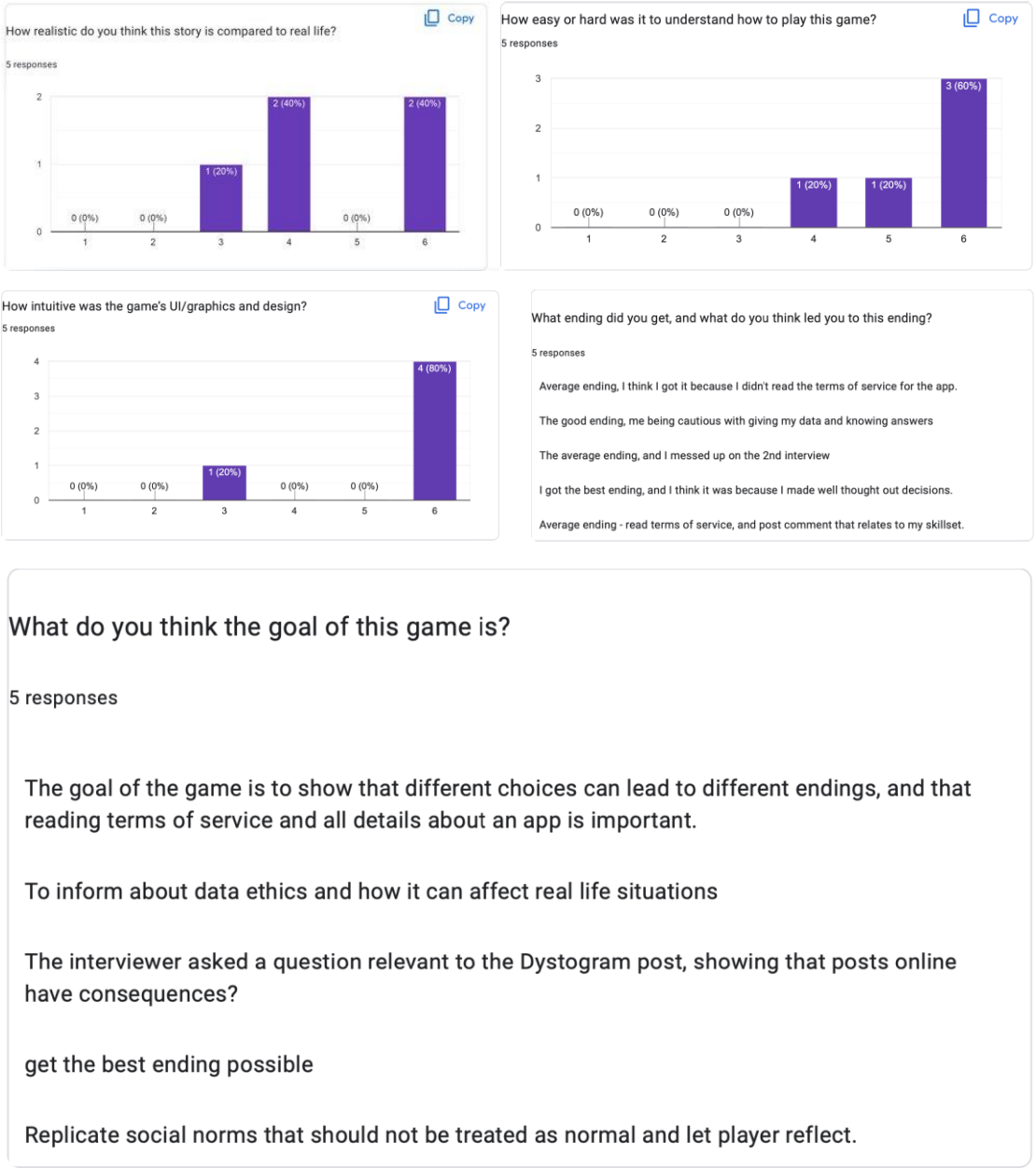


Figure. 6.2. User Testing Certification. Source. Screen Capture.

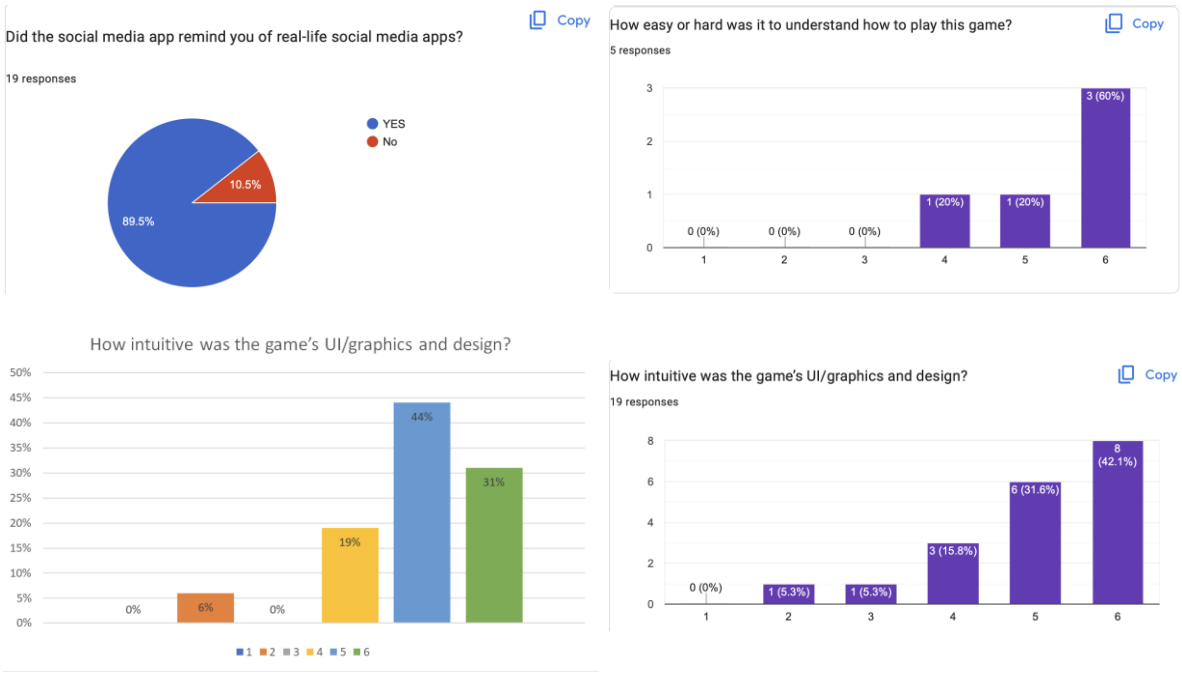
After completing our certifications, we then had to follow the safe protocols we learned about before running our testing. We provided two separate forms for players to read before playing (an Informed Consent document that they were required to sign and a Covid Safety form that was just FYI and did not require a signature). The surveys we made on Google Forms so that we could gather valuable analytics and combine all of our results. We ended up having two separate playtesting sessions using this method. The first round only had five people but gave us enough information to know that we needed to make significant changes to our story. The second round of this playtesting method came far later after we had changed the game's story entirely. This time around, we got way more testers (30 total). We also started getting the results we wanted from this testing. Testers were finally making a connection between the game's story and the different topics that we wanted to convey.

Round 1:



Figures 6.3. Round 1 Playtesting. Source. Screen capture, Google form.

Round 2:



Figures 6.4. Round 2 Playtesting. Source. Screen capture, Google form.

Some highlights of this second round of testing were that (unlike the first round) players were able to make a clear connection between the game and the topics we wanted to include in it. When asking them what they thought the point of the game was, testers responded with things like "to alert people about the importance of information security," "make people feel that they are being watched by their mobile phone, or make people realize that user terms should be treated carefully," and "to teach people about the dangers of social media and how that may impact everyday life such as looking for work." This was much better than Round 1 when testers were saying "get the best ending" or "get both jobs."

The other methods of playtesting were used less than this but were also very helpful. We performed monitored playtesting with some friends where we would just have them play the game while we watched. This method is good for finding player tendencies and figuring out issues with the game that testers do not even think to put on playtesting surveys. We also asked questions to these players to try to get better responses. One friend who tested the game for us said to us, “this game's story is almost exactly what happened to me in real life when I was looking for my first job out of College with one of my interviewers asking me personal stuff about me that they found from my LinkedIn page.”

The last method we used was the teaching guideline.

6.3. Teaching Guideline

To help find out if we had built a game that would be good for teaching, we used another method. We had Professor Telliel have his graduate class play the game and then complete some exercises after that were meant to encourage discussion and critical thought. We created a document for him to use during this exercise and called it Teaching Guidelines. There were four pages in total. The first page was a list of tasks for the professor who plans on using this game as a teaching tool. These tasks were separated out into before, during and after tasks. The second page was full of interesting discussion questions to ask the students after they finished playing the game that were meant to provoke a discussion or a debate. The third page was a list of activities to go along with the game that were meant to help the players/students relate to the character in the game and see if they know a lot about their own

digital footprints. The last page was a list of recommended resources that could be of interest to the students.

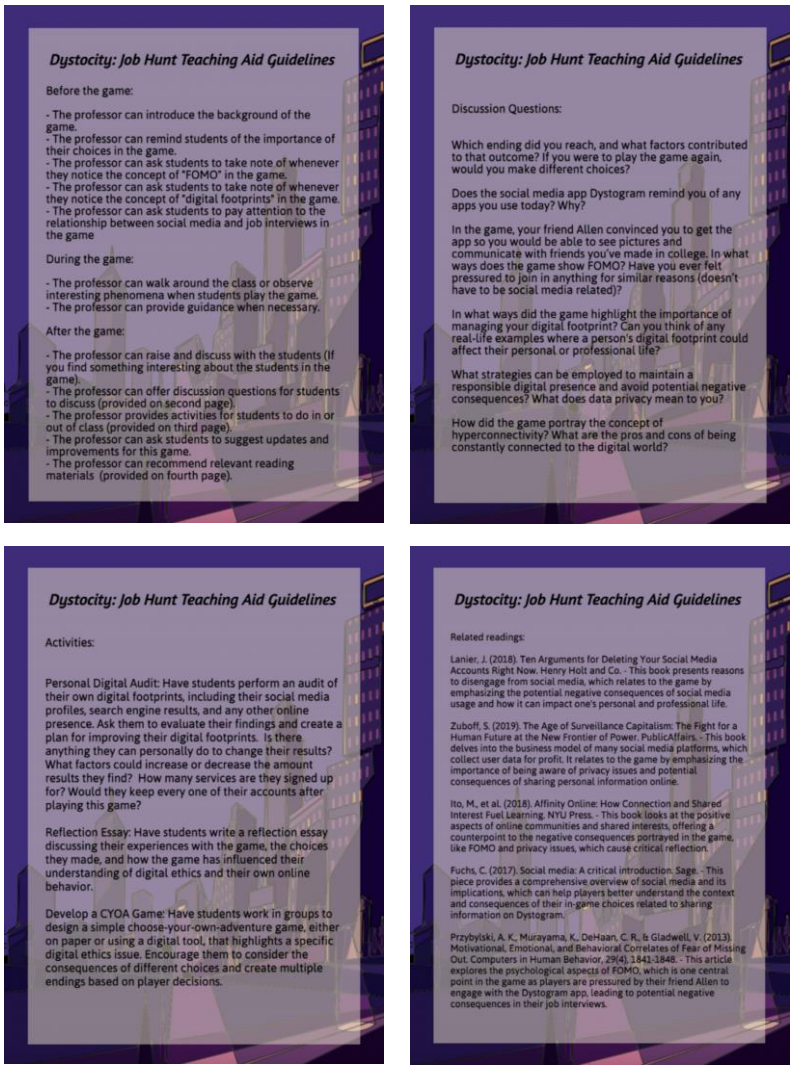


Figure 6.5. Teaching Guideline. Source: Photoshop

After having the students go through this process, we were able to get feedback from them on the teaching guidelines themselves. We had great feedback from the students and

would want to make a few edits to these documents in the future if this project was to be used in real classes in the future.

Some interesting and valuable feedback and quotes from students:

"Mentioning things like FOMO could skew the students to pick one way or another as they know to watch out or pay attention to situations that include FOMO, I would move this to a discussion question at the end of the game."

"I think asking the students to discuss if they agree with the ending relating to their decisions could lead to interesting discussion and self-reflecting."

"It would be good to ask 'how did the game make people feel. Did the game relate to the student's personal life and ask if the students feel like providing examples.'"

"The Personal Audit could be fun, but I think it should be ok if some don't want to participate. They might want to keep things private."

"I like the idea of doing a CYOA game. It would be a good idea to try to have them make their game based on the concepts they just learned from playing this game."

"Related reading on how users read terms and services, possibly a way to test different versions of the game:

Steinfeld, N. (2016). 'I agree to the terms and conditions': (How) do users read privacy policies online? An eye-tracking experiment. Computers in human behavior, 55, 992-1000."

With these students' feedback, we have decided to update the guidelines in the future for when this game potentially is used in classrooms for real. This experiment was extremely helpful in showcasing how our game would be perceived by students if used in a teaching setting.

6.4. Analysis

The whole point of playtesting was to get results. Because of this, we tried to pool all of the data that we collected together to find norms, patterns, and problems. Some of the screenshots included above are examples of some analytics we were able to put together to figure out how the app was performing. The most important thing that we had to do when analyzing the playtesting was to compare the data we received from different rounds of

playtesting. This helped us determine whether we were successfully improving the game based on the playtesting results or not.

7. Conclusion

How did our game perform in playtesting when compared to our evaluation goals? What could become of this project in the future?

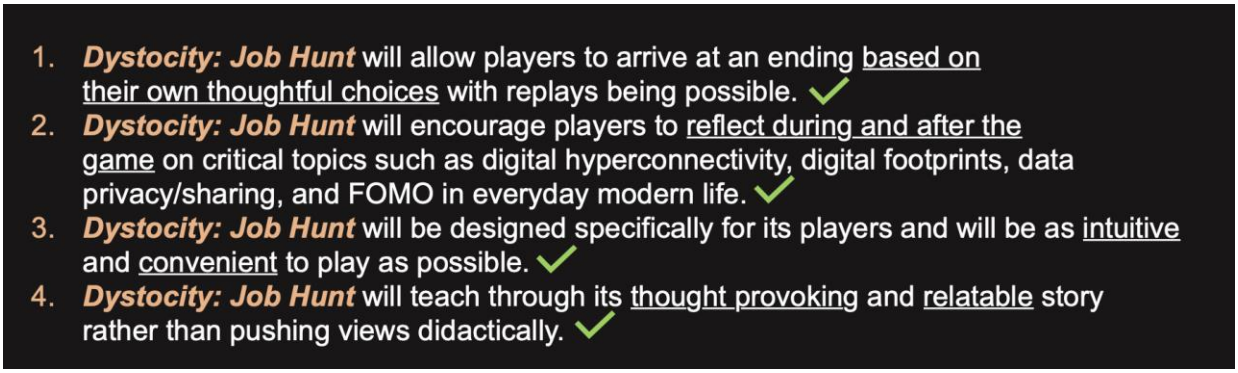


Figure 7.1. Project goals analyzed. Source. Screen capture.

7.1. Functionality

From the very beginning, this project delivered on its functionality. Players were able to play through the whole game every time with no problems and get to the endings that their choices awarded them. Even the extra features of this game seemed to always work and even were able to give this game more bulkiness and add to its ability to be replayed. This was never a concern for us even in our very first playtesting almost five months prior to this report, and none of the newer data showed otherwise.

7.2. Topics

Unlike the game's functionality, this goal was not reached at the very beginning. We had to work harder for it (not that the technology was easy). Our first round of playtesting was cut short because we were already seeing a trend that the game did not convey what we wanted it to as well as we would have hoped. We had to go back to the drawing board for months to come up with a new solution. The new solution ended up being to rewrite the story (almost from scratch) while using the same technological skeleton that the old story used. This proved to be the single most difficult part of the project. In the end, it was worth it though. Our latest round of playtesting showcased an entirely different story than the first one with most testers making the correct connections that we wanted them to be making to justify that the story was pushing our topics. Although our game was not perfect in this regard, the latest round of testing (after the story change) proved that it was delivering on what we wanted it to be delivering on.

7.3. Accessibility

Similarly, to its functionality, our game demonstrated that it was as accessible as possible from the very beginning. We believe that choosing to host our app as a web application contributed to its overall convenience (to find) and let players reach it from any device that has internet and access to a browser. We tried also giving our game good contrast with colors and text to improve the experience for anyone who plays, even if they are color

blind. The text ended up being a little hard to read according to the playtesting, so we added some drop shadow to the text and background glow to improve this. There were a lot of different ways we could go about this, so in the future we could even try a different method if it continues to be a problem. Most buttons include certain animations like glowing effects or hover effects to encourage players to press them and realize that they are interactable items. There were even some significant improvements that we were able to add to the game that allowed the player to press specific keys (SPACEBAR and RIGHT ARROW) that improved the quality and efficiency of the gameplay. This ended up being a great addition on bigger screens, because players no longer needed to move their mouse across the screen all the time to press the next buttons. Both sets of play testers provided validation that the game was intuitive and easy to learn. Both sets of play testers enjoyed the games UI design and story progression design more than they hated it. Both sets of play testers commented on the fact that the game was relatable and easy to understand. Our game delivers on this goal.

7.4. Learning with Our Game

We decided from the first week that we intended to have our game be a place where players could go to be entertained and to learn. Our goal was never to "teach" players about what was right/wrong, moral/immoral, etc. The research executed in our preproduction phase led us to believe that telling players the right answers is less effective than having them figure it out on their own. This was especially important for us because of the nature of data ethics in the first place. It is a topic that changes depending on the perspective and situation that it is

applied to. Each player may think about it differently. Morals and ethics are often different from one situation to another, and the "right thing" generally varies as well. We gave players a chance to be a character in our story that had all the power. This let players choose how *they* would want to act in certain situations, rather than us telling them how *we* personally think they should act.

Letting players feel like they had come to their own conclusions, even if we are trying to push those conclusions and thoughts to the surface subliminally, was what we wanted to achieve. We allow players to make "mistakes" throughout the game, and when they see what ending they get, we only supply them with a list of their choices rather than stating any reasoning. This gave players a chance to see which of the choices they made could have affected the game. A huge part of figuring out if we did a good job in this regard was given to us when we received our playtesting survey results. When asked why players think they got the ending they got, a majority of them were able to say that it was because they were or were not paying enough attention to the concerning topics that were present in the game and that they had or had not made the right decisions based on them. Some players even stated that they wished they could have been even safer and never even gotten the potentially dangerous social media app if they could have made this choice. At first, we were not getting responses like this, but as we iterated on the game and on our playtesting rounds, we started to see the results we were looking for.

With the game being centered around modern and real-life potential dangers from issues related to social media in the hyperconnected era, the players can benefit from the lessons that our story tells. Players may not know anything about our topics, in which case they

may be able to benefit greatly from playing this game and thinking about them as they play. Some players may even know about these topics, but not how they happen in the real world or how detrimental they really could be, in which case our game could be great at providing a space for them to gain a deeper understanding of these topics. Our target audience, much like us, grew up in an age where they understand a lot of the topics we cover, but even with this knowledge, there are other factors at play such as not having motivation, energy, or care to always be mindful and careful about them. For these players, our game benefits them by serving as a reminder of what could happen to them in real life. This was one of the biggest reasons that we wanted to narrow down our audience and give the game a natural and relatable feeling story. The limited timeframe for us to create this game hurts because we know we could have done even better than we did, but overall, our game delivers on this final goal as well.

7.5. Project Analysis

In our eyes, based on a qualitative and quantitative compared analysis of playtesting and research, we believe that our goals were met. This project has consumed us for the better part of the last year, and we are extremely proud of what we have created. What could come of this project in the future? Improvements could be made, additions could be added, bugs could be fixed, and lessons could be taught. Much like in *Dystocity: Job Hunt,* the next decision is ours to make.

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Appendix A: IRB Informed Consent Agreement

Informed Consent Agreement for Participation in a Research Study

Investigators: Fangtai Bao, Timothy Drevitch

Contact Information: fbao@wpi.edu, tedrevitch@wpi.edu

Title of Research Study: Playtesting Study for IMGD MS Thesis serious game *Dystocity: Job Hunt*

Sponsor: None

Introduction
You are being asked to participate in a research study. Before you agree, however, you must be fully informed about the purpose of the study, the procedures to be followed, and any benefits, risks or discomfort that you may experience as a result of your participation. This form presents information about the study so that you may make a fully informed decision regarding your participation.

Purpose of the study: The purpose of this study is to obtain feedback on the project in order to facilitate design improvements.

Procedures to be followed: You will be asked to play a brief online game lasting about ten minutes. Your activity during play will be recorded into the game database anonymously. After completing the game, you will be asked to complete a brief, anonymous survey describing your subjective experience.

Risks to study participants: No risk greater than experienced in everyday life.

Benefits to research participants and others: The researcher will obtain playtest feedback that will improve the design of the project and the quality of the evaluation portion of the project report. The game could improve at how well it can teach new players after this study. The player themselves will not have any great benefits other than having an account with the game now and potentially getting play-testing credits for their WPI courses.

Record keeping and confidentiality: Records of your participation in this study will be held confidential so far as permitted by law. However, the study investigators, the sponsor or its designee and, under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data that identify you by name. Any publication or presentation of the data will not identify you.

APPROVED BY
WPI IRB-1
1/24/2023

Compensation or treatment in the event of injury: There is no foreseeable risk of injury associated with this research study. Nevertheless, you do not give up any of your legal rights by signing this statement.

For more information about this research or about the rights of research participants, or in case of research-related injury, contact Fangtai Bao at fbao@wpi.edu and Timothy Drevitch at tedrevitch@wpi.edu. You may also contact the WPI IRB Manager (Ruth McKeogh, Tel. 508 831-6699, Email: irb@wpi.edu) and the Human Protection Administrator (Gabriel Johnson, Tel. 508-831-4989, Email: gjohnson@wpi.edu).

Your participation in this research is voluntary. Your refusal to participate will not result in any penalty to you or any loss of benefits to which you may otherwise be entitled. You may decide to stop participating in the research at any time without penalty or loss of other benefits. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

By signing below, you acknowledge that you have been informed about and consent to be a participant in the study described above. Make sure that your questions are answered to your satisfaction before signing. You are entitled to retain a copy of this consent agreement.

_____ Date: _____
Study Participant Signature

_____
Study Participant Name (Please print)

_____ Date: _____
Signature of Person who explained this study

APPROVED BY
WPI IRB-1
1/24/2023

Appendix B: IRB Methodology

Methodology

The purpose of this research is to obtain user feedback to determine if the serious gaming project *Dystocity: Job Hunt* can achieve its experiential goals - encourages players to not only choose their own adventures to obtain different possible endings, but also to learn the impact of particular aspects of digital hyperconnectivity in daily life. Also, it will iterate through research to identify opportunities for design improvement. The goal of this research is to observe and record the game behavior of students in related program or department from WPI in the game test and ask them to give feedback on the serious game project through a post-test questionnaire to identify whether the project reaches the goals.Testers of interest fall into two categories, as they pertain to the primary research questions. Broadly, the testers may be one of the following: students in WPI interactive Media & Game Development program, and students in WPI Computer Science department.

Research subjects will be asked to play a game online at WPI Rubin Campus Center, and the total duration of the game is about 10 minutes (the actual duration of the game depends on the game habits of the testers). Research subjects will be required to register by an email address, and data about their activities during the game will be recorded anonymously and stored in the game's database. After completing the game, participants will be asked to complete an anonymous survey describing their subjective experiences. These records will be deleted after review. The principal investigator will retain all of the signed informed consent agreements in a secure location for at least three years after the end of the study.

Under the premise of trying to ensure a balanced number of male and female testers, the research seeks about 20 testers. Testers were selected from among 1) WPI's IMGD students; and 2) WPI's CS students. We will use the WPI database to identify these testers. Potential testers will be contacted via email using a @wpi.edu address.

Sample Questions

Research Question Category #1: These questions focus on the whole game and creation of story narrative to determine whether Project *Dystocity: Job Hunt* can achieve its experience goals of "seriousness". Sample questions may include:

- What ending did you get? (Great ending. /Normal ending. /Bad ending.)
- How much do you like the character of Allen? (Hates him so much 1-5 Likes him so much)
- How does Allen make you feel? (Answer:)
- What are you thinking after you finish the game? (Answer:)
- Do you think the game story is attractive? (Very unattractive 1-5 Very attractive.)
- What do you think the goal of the game was? (Answer:)
- What frustrates you the most in this game? (Answer:)
- What is your favorite aspect of the game? (Answer:)
- Is there something that you think should be in the game but is not? (Answer:)
- If you were to change, add or delete something from the game experience, what would it be? (Answer:)

Research Question Category #2: These questions focus on whether the whole game is as intuitive and convenient to play as possible to determine whether the project *Dystocity: Job Hunt* can achieve its experience goals of "gameplay". Sample questions may include:

- Do you think the game is easy to play? (Very easy. 1-5 Very hard.)
- Do you like the UI design of the game? (Like. /Don't like)
- If you don't like it, please tell us the reason. (Answer:)
- How much do you think the game's images contribute to the gaming experience? (Ruin the game experience. /Don't help the game experience. /Help the game experience.)
- How much do you think the background music of the game contributes to the gaming experience?
  (Ruin the game experience. /Don't help the game experience. /Help the game experience.)
- How much do you think the sound effects of the game contribute to the gaming experience?
  (Ruin the game experience. /Don't help the game experience. /Help the game experience.)

Appendix C: Playtesting Survey

Post Survey

1. Have you played this type of game before?

- ○ Play a lot
- ○ Play occasionally.
- ○ Playing for the first time.

2. How easy or hard was it to understand how to play this game?

	1	2	3	4	5	6	
Impossible	○	○	○	○	○	○	Completely straight forward

3. How intuitive was the game's UI/graphics and design?

	1	2	3	4	5	6	
Not intuitive at all	○	○	○	○	○	○	Completely straight forward

4. Why (optional)?

_____

_____

5. How did you feel about the game's UI/graphics and design?

	1	2	3	4	5	6	
Hated it	○	○	○	○	○	○	Loved it

6. Why (optional)?

_____

_____

7. How much do you like the sound effects and music of the game?

	1	2	3	4	5	6	
Hated it	○	○	○	○	○	○	Loved it

8. Why (optional)?

9. What ending did you get, and what do you think led you to this ending?

10. How likely are you to repeat the game to learn more about the story and the ending?

	1	2	3	4	5	6	
Not at all	○	○	○	○	○	○	Very likely

11. How realistic do you think this story is compared to real life?

	1	2	3	4	5	6	
Not at all	○	○	○	○	○	○	Very much

12. Did the social media app remind you of real-life social media apps?

13. In the game, do you like or hate Allen's behavior?

	1	2	3	4	5	6	
Hates it so much	○	○	○	○	○	○	Likes it so much

14. Why(optional)?

15. In the game, did you feel offended by the interviewer's questions?

	1	2	3	4	5	6	
Not at all	○	○	○	○	○	○	Very much

16. Why (optional)?

17. What do you think the goal of this game is?

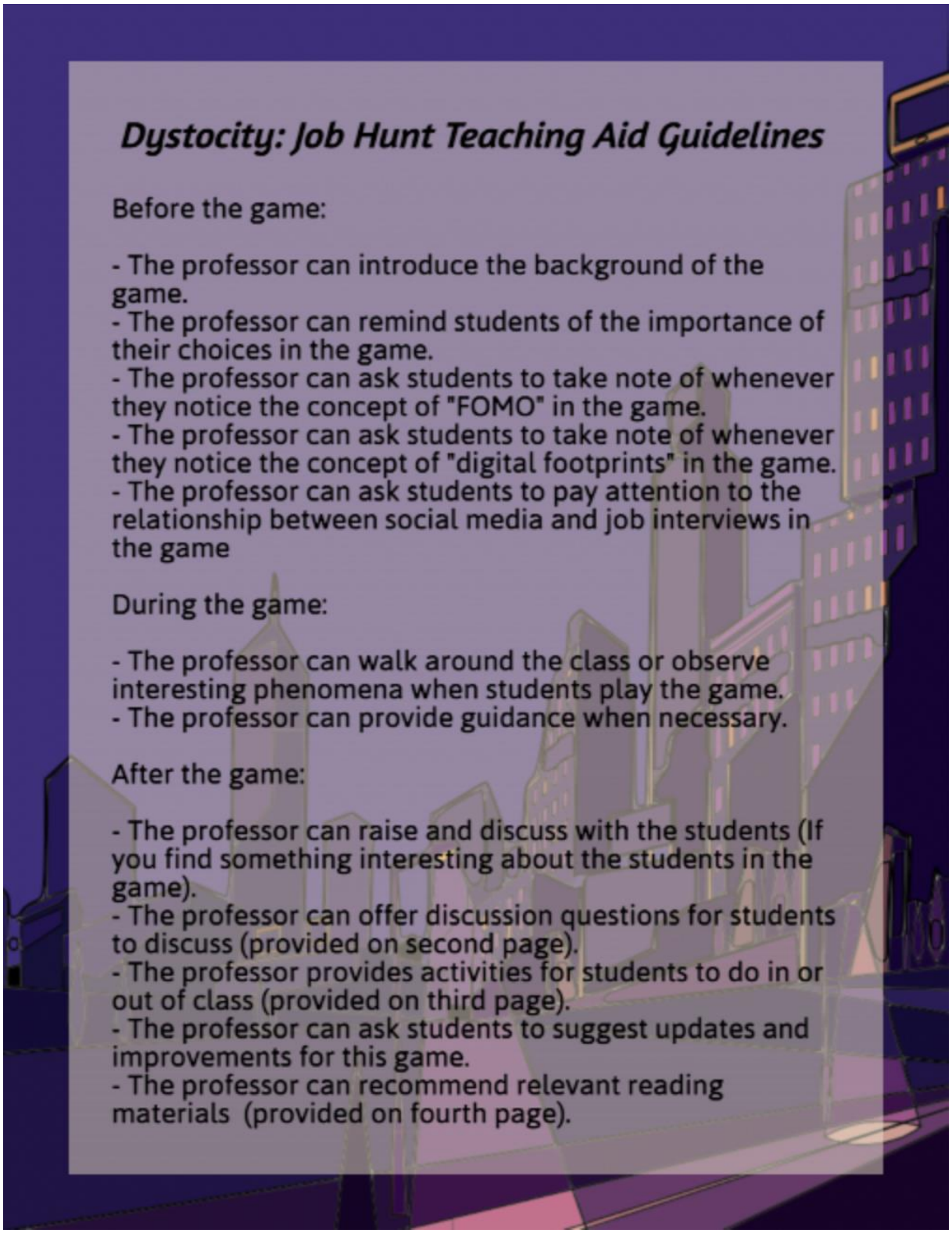
18. What frustrates you the most during the game?

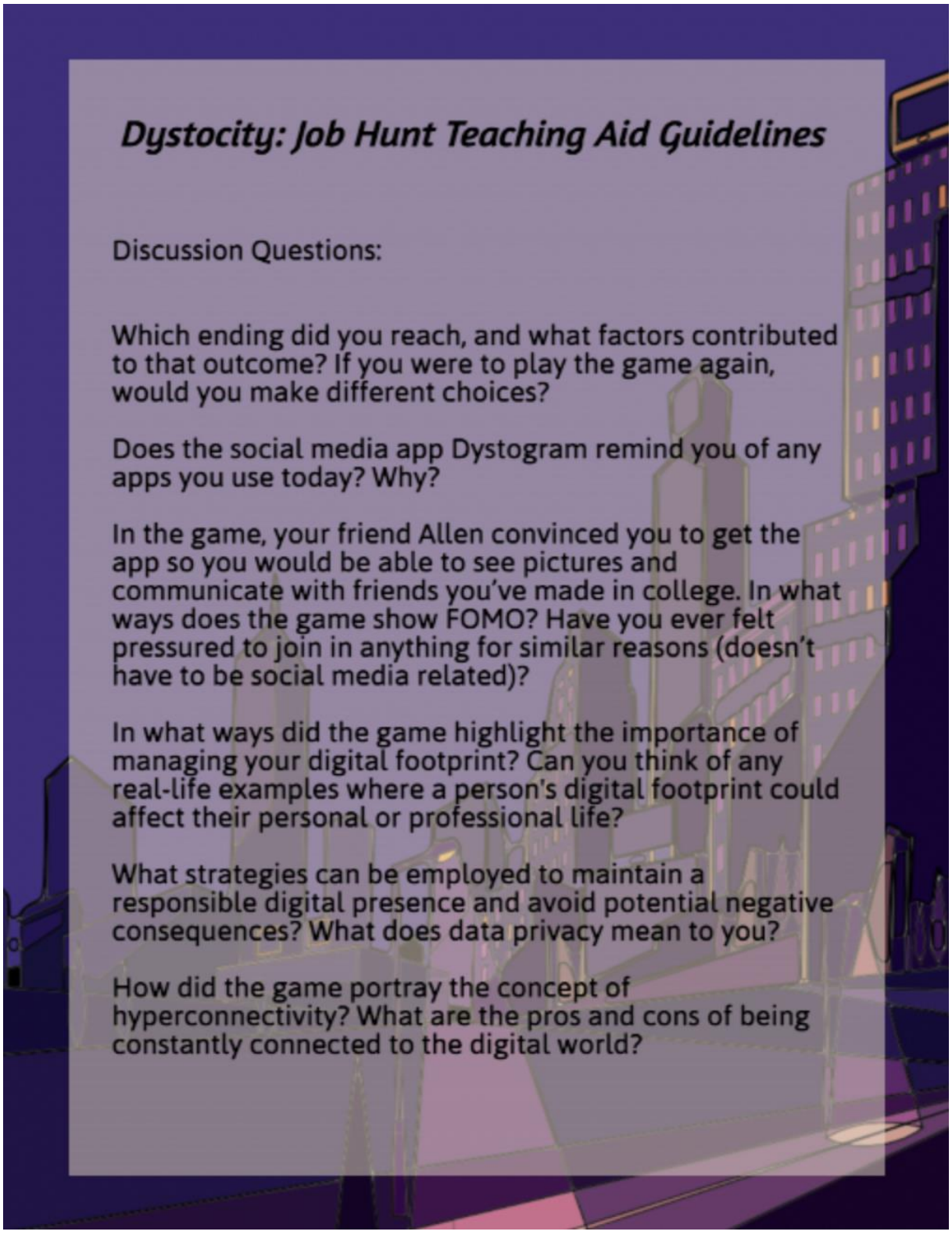
19. What is your favorite part of the game?

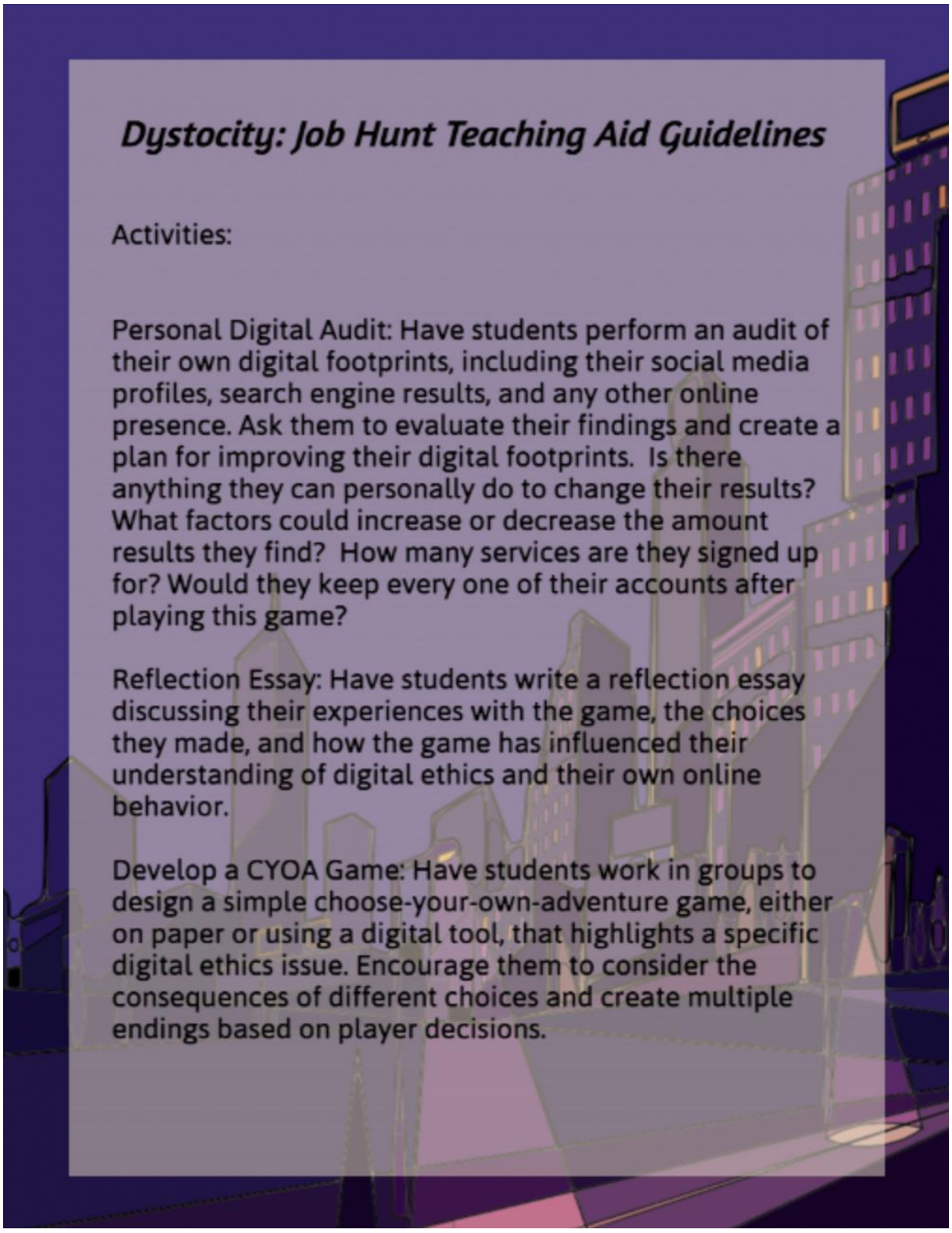
20. What update(s) are you most looking forward to in this game?

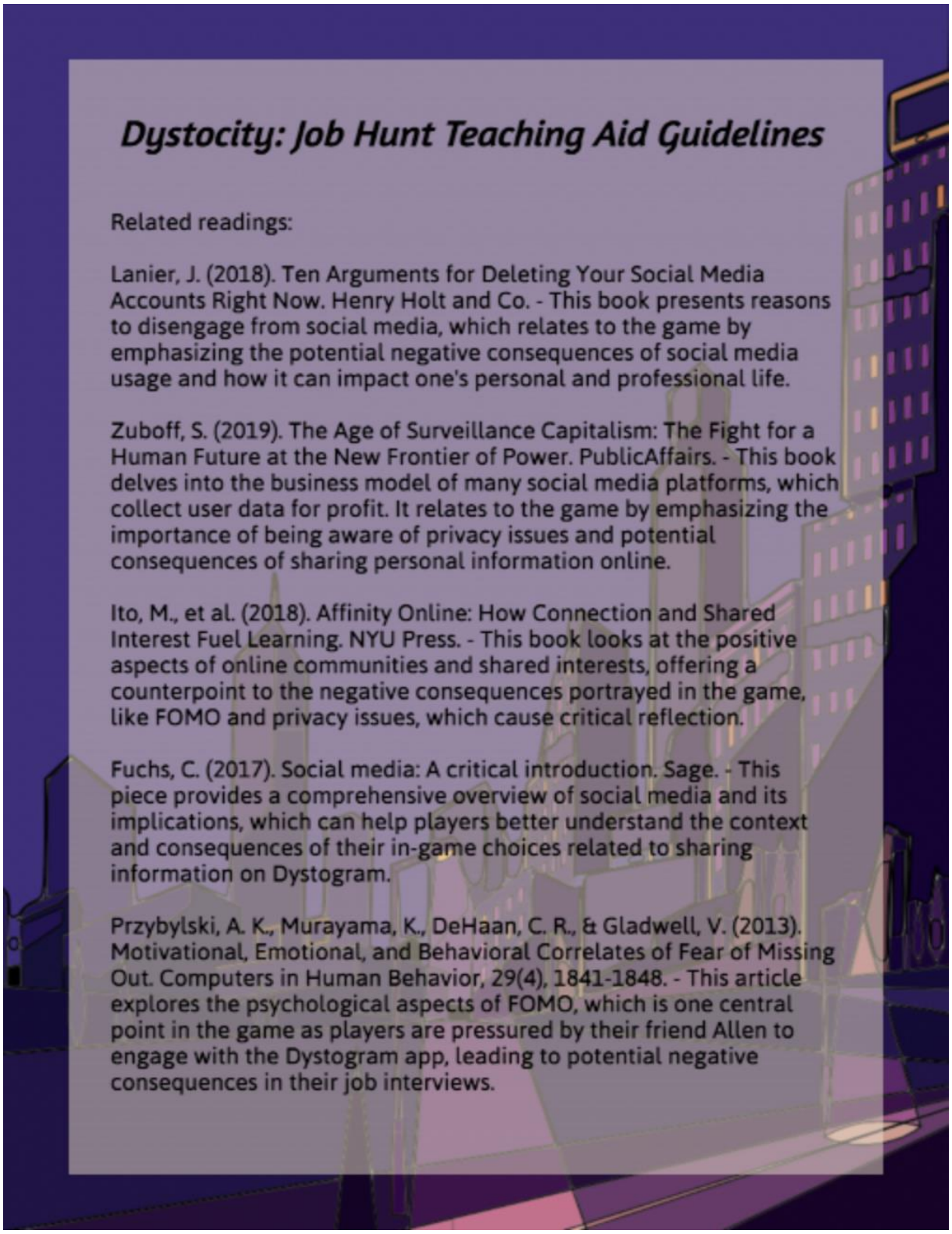
21. Do you have any suggestions to the developers?

Appendix D: Teaching Guideline




Dystocity: Job Hunt Teaching Aid Guidelines
Discussion Questions:
Which ending did you reach, and what factors contributed to that outcome? If you were to play the game again, would you make different choices?
Does the social media app Dystogram remind you of any apps you use today? Why?
In the game, your friend Allen convinced you to get the app so you would be able to see pictures and communicate with friends you've made in college. In what ways does the game show FOMO? Have you ever felt pressured to join in anything for similar reasons (doesn't have to be social media related)?
In what ways did the game highlight the importance of managing your digital footprint? Can you think of any real-life examples where a person's digital footprint could affect their personal or professional life?
What strategies can be employed to maintain a responsible digital presence and avoid potential negative consequences? What does data privacy mean to you?
How did the game portray the concept of hyperconnectivity? What are the pros and cons of being constantly connected to the digital world?


Dystocity: Job Hunt Teaching Aid Guidelines
Activities:
Personal Digital Audit: Have students perform an audit of their own digital footprints, including their social media profiles, search engine results, and any other online presence. Ask them to evaluate their findings and create a plan for improving their digital footprints. Is there anything they can personally do to change their results? What factors could increase or decrease the amount results they find? How many services are they signed up for? Would they keep every one of their accounts after playing this game?
Reflection Essay: Have students write a reflection essay discussing their experiences with the game, the choices they made, and how the game has influenced their understanding of digital ethics and their own online behavior.
Develop a CYOA Game: Have students work in groups to design a simple choose-your-own-adventure game, either on paper or using a digital tool, that highlights a specific digital ethics issue. Encourage them to consider the consequences of different choices and create multiple endings based on player decisions.


Dystocity: Job Hunt Teaching Aid Guidelines
Related readings:
Lanier, J. (2018). Ten Arguments for Deleting Your Social Media Accounts Right Now. Henry Holt and Co. - This book presents reasons to disengage from social media, which relates to the game by emphasizing the potential negative consequences of social media usage and how it can impact one's personal and professional life.
Zuboff, S. (2019). The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power. PublicAffairs. - This book delves into the business model of many social media platforms, which collect user data for profit. It relates to the game by emphasizing the importance of being aware of privacy issues and potential consequences of sharing personal information online.
Ito, M., et al. (2018). Affinity Online: How Connection and Shared Interest Fuel Learning. NYU Press. - This book looks at the positive aspects of online communities and shared interests, offering a counterpoint to the negative consequences portrayed in the game, like FOMO and privacy issues, which cause critical reflection.
Fuchs, C. (2017). Social media: A critical introduction. Sage. - This piece provides a comprehensive overview of social media and its implications, which can help players better understand the context and consequences of their in-game choices related to sharing information on Dystogram.
Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, Emotional, and Behavioral Correlates of Fear of Missing Out. Computers in Human Behavior, 29(4), 1841-1848. - This article explores the psychological aspects of FOMO, which is one central point in the game as players are pressured by their friend Allen to engage with the Dystogram app, leading to potential negative consequences in their job interviews.