

Building Resilience

Multidisciplinary Research, Iterative Processes, and Serious Game Design

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ABSTRACT

This article is an in-depth retrospective on the development of *Resilience*, a serious game designed by our student team at Drexel University and intended to engage a wide audience in the discussion of the ongoing global refugee crisis. Drawing on methodologies from scholarly research on serious game design, we review the major design decisions we made during the production of *Resilience*, deconstruct the limitations we faced, and discuss how the effectiveness of the final product was impacted as a result. The ultimate purpose of this analysis is to reflect on the development of *Resilience*, as well as to offer advice for future developers to successfully incorporate serious topics into entertainment, create meaningful learning experiences, and forge empathetic connections between the game's subjects and the audience.

INTRODUCTION

Resilience is a sci-fi city-builder game designed by our team of 18 students for our undergraduate capstone project. Through engaging gameplay, the primary goal of *Resilience* is to foster empathy for people facing displacement due to conflict or disaster. Our game intends to build compassion for refugees and their stories, as well as promote a greater awareness of the real-world situations that refugees endure. Our team

wanted to create a serious game focused on presenting these issues in an accessible and engaging way and we intend to reflect on our design approaches and constraints.

While thinking about how our reflection fit into existing scholarship, it was clear that it would involve the espousal of a large body of academic research about the effectiveness of serious games and the challenges of balancing learning goals of the game with engaging gameplay. Bogost (2008) describes how game mechanics contain their own powerful rhetorics; Belman and Flanagan (2010) propose methodologies for the power of empathy and serious games; and Mitgutsch and Alvarado (2012) standardized the components of successful serious games. Along with many others, these contributors built the body of research that we now stand on the shoulders of. In fact, a great deal of research exists on serious games—specifically addressing displaced people, such as Raessens (2015), Sou (2017), and Gabriel (2018). However, none of these analyses featured first-person reflections by the creators themselves to analyze the intentions of their design, rationales behind decisions, and effectiveness of implementation. Designing and balancing game mechanics presented unique challenges, as our team had to create systems that represented real world dynamics, while holding the player's interest. Since our team initially possessed limited knowledge on the refugee crisis and no firsthand experience as a refugee, we needed to take additional steps in our research and design to ensure our depictions were well informed and respectful. In this reflection, we provide an earnest retrospective into those decisions, how they impacted the final game, and how they compare to other serious games as well as the literature on serious game design practices. We believe that contributing such a work would empower other students and designers to explore serious topics, delve into research, and produce impactful projects.

METHODOLOGY

Resilience is ultimately the product of team decision making, in-depth research, external feedback, interconnected systems, and methodical iteration. To help us analyze *Resilience* as the sum of its parts, we selected a framework that considers individual facets of design and how they connect

to the holistic experience. The Serious Game Design Assessment (SGDA) framework put forward by Mitgutsch and Alvarado (2012) proposes six core components which together form a game system. These core components include purpose, content and information, fiction and narrative, mechanics, aesthetics and graphics, and framing. Mitgutsch and Alvarado (2012) examine each of these core elements on their own, and also analyze how each contributes to the game as a whole.

This article is structured in accordance with the SGDA framework and underscored with analysis of each of those core elements listed above; further research was incorporated to support these examinations. We conclude each section with reflections on the effectiveness of each element and advice for future designers based on the challenges and successes we experienced from our design process.

PURPOSE

What differentiates serious games from the broader field of gaming is the operative intention at the heart of their design and execution. Instead of seeking to solely entertain, serious games utilize play and interactivity to inform, engage, and/or have an impact on their players (such as education, physical fitness, mental wellbeing, or advocacy). As stated by Mitgutsch and Alvarado (2012), “the game’s purpose acts as the driving force that shapes the dynamic and the coherence of the game system as a whole” (p. 123).

The primary goal of *Resilience* is to build empathy and awareness for displaced people. ‘Empathy’ is a complex term with many meanings, but within this article, we will apply the framework developed by Belman and Flanigan (2010) in their essay “Designing Games to Foster Empathy.” They employ research from business, therapy, education, and psychology to construct a definition of empathy that includes both cognitive empathy, when one seeks to understand the thoughts and circumstances of another’s life, and emotional empathy, when the experiences of another elicit strong emotional responses in oneself (Belman & Flanigan, 2010). Belman and Flanigan argue that the games with the strongest long-term impact on players’ actions are ones that evoke both cognitive and emotional empathy. *Resilience* was designed with the intention of

galvanizing players to take more personal action in support of refugees through performing further research on the subject, raising awareness, making donations, and/or taking political action. We were specifically interested in reaching audiences from certain developed nations (such as the USA, the UK, France, Germany, Canada, and Australia) whose governments have significant resources and capabilities to impact refugee lives for the better, but also face waning political support for aid, due to growing anti-immigration public sentiment.

We chose to focus our game specifically on the plight of refugees living in temporary settlements run by governments or intergovernmental organizations like the United Nations. We were inspired by news stories about two refugee camps breaking during the early summer of 2019, which coincided with the initial conceptualization of the game. The first, Camp Moria, on the Greek isle of Lesbos, was an unfolding human rights disaster caused by overcrowding (Barberio, 2018; MSF, 2019). The camp held more than triple its capacity; disease, abuse, hunger, and depression ran rampant (Barberio, 2018). The second camp, Kutupalong Camp in Bangladesh, had become the largest refugee camp in history with a population of roughly 740,000 (larger than Washington D.C.), after the Myanmar military began a systematic campaign of ethnic cleansing against the Rohingya Muslim minority (Skretteberg, 2019).

Based on our research and a commitment to making empathy the center of our game, we devised a list of prioritized key takeaways for players that would motivate them to help refugee populations. First, we wanted players to understand that sufficient, non-earmarked funding is essential to proper management of camps (Bond, 2018; UNHCR, 2019a). Second, we wanted to illustrate the dangerous strain on resources that overcrowding within camps creates (MSF 2019; Skretteberg 2019; Tagaris 2019). Third, we wanted to demonstrate how the only viable solution to camp overcrowding is to provide permanent homes for refugees; this can include enabling refugees to return home, or through the offering of a permanent resettlement—either in the host nation or in a new country (UNHCR, 2019b). These objectives served as guiding pillars for our team as we added new content into the game and refined existing features to better

reflect our mission. It was equally vital for us to reevaluate these takeaways throughout our research and production of the project.

As Mitgutsch and Alvarado (2012) argue, the most impactful serious games are those that allow their goals to permeate through every aspect of their design. For us, this meant taking the time to fully grasp the problem we sought to tackle with our game as well as mapping out the takeaways we wanted players to leave the gameplay experience with. We asked ourselves the following questions about our overarching objectives: What problem, and what specific areas of that problem will this game address? What features of this game tie into the problem, solution, or discourse? What is the most important thing for players to gain from interacting with this game? We prioritized establishing these goals first, before making any decisions about genre, setting, narrative, or aesthetics. This ensured that as we made those subsequent design choices, we were guided by the game's purpose, and all our choices could serve to reinforce these goals as a cohesive whole. We felt we were successful in creating a game that was strongly focused around its purpose, and this is a facet of our approach that we would repeat in subsequent projects.

CONTENT AND INFORMATION

Mitgutsch and Alvarado (2012) argue that any game seeking to teach the player must include information that is “well presented, adequately formulated” and, of course, “correct” (p. 124). Accurate and responsible depictions of displaced people are essential to the success of any serious game trying to assist them. In international news, portrayals of refugees shifted to be distinctly more negative as the number of displaced people continued to increase and the “refugee crisis” became a larger part of the news cycle (Eberl et al., 2018; Willmott, 2017). These negative depictions can influence individual empathy toward refugees and decrease the likelihood of supporting political action to aid refugees (Azevedo et al., 2019). Having an awareness of the biases towards and stereotypes of the refugee population was crucial in the creation of Resilience, a game intended to reverse these negative sentiments.

The process of researching, synthesizing, and implementing information

within our game was a continual effort throughout the development of *Resilience*. Although our team members came from diverse backgrounds, we recognized that no team member had experienced forced displacement; as a result, we needed to draw from research and experience beyond our team.

Incorporating Refugee Voices

In addition to portraying the experiences of marginalized peoples with accuracy and in a positive light, it is also vital to express these depictions with urgency and respect. A large body of academic work exists that examines refugee voices, and how these voices can be suppressed, disregarded, de-politicized, and homogenized for the comfort of a Western audience (Godin & Doná, 2016; Jones, 2019; Sigona, 2014). The rawest condemnations come from Jones (2019, p. 2):

At worst, such voices can be counterproductive, serving as a simulacrum of genuine voice, which provides a (vanishingly small) audience with the self-satisfaction of having “done something” without really *doing anything*. There is often a self-congratulatory tone to these exercises, as if hearing the voices of refugees is the end of a process, rather than its beginning. Such performative exercises... are profoundly insulting and disheartening to refugees themselves.

In the above quote, Jones is speaking directly about news media and organizations that feature curated refugee testimony, but the same critique can be leveled towards games. Although it can be difficult, it is important to honestly reflect upon a project dealing with such personal narratives and ask if we were sensitive enough with them, and did we *do* enough with them.

When a member of the Drexel community with past experiences as a refugee came forward and was willing to speak to us about our project, we listened carefully to everything they had to say. This person was familiar with serious games and was able to give us many useful resources and pointers, in addition to describing personal experiences. This person's feedback influenced further research as well as the design of our mechanics, dialogue, and visuals, and we are extremely grateful for the insight shared with us.

Beyond these conversations, however, we did not seek any additional interviews with other refugees. Although incorporating diverse voices would have certainly added to our game, Jones (2019) indicated that asking a refugee to relive their experiences is often “an exhausting and traumatic process” and that soliciting such information without the ability to promise direct and material changes for that refugee’s conditions as a result is “manipulative and cruel” (p. 2). Jones (2019) and Cabot (2016) also documented the high level of sociological training and institutional structure necessary to perform these interviews in a manner that is both sensitive and inclusive. We knew that our talents as a team reflected those of programmers, 3D artists, musicians, and game designers, and that our skillsets and resources fell significantly short of the required training. We found that when designing a serious game, it is equally important for us to know the strengths of our team as it was to acknowledge our limitations, and work within them. Ideally, we should have acquired more team members with the appropriate skill sets and allocated more time to reaching out to other primary sources. Additionally, we could have sought out refugee voices to include directly within our team and advisory sphere, but we were unfortunately limited in the scope of our project and timeline.

To try to compensate for this shortcoming, we doubled down on our research efforts by seeking out advisors and reading refugee testimonies, academic articles, news stories, and reports from organizations like the United Nations High Commissioner for Refugees (UNHCR).

We knew it was important to be able to consult regularly with someone knowledgeable about refugee issues who could help us with our research and development process. At the start of our project, we brought on as a research advisor to the project, Amelia Hoover Green, a professor in the Political Science department at Drexel University whose research focuses on violence towards civilians in wartime. We held weekly meetings with her throughout the first eight months of the project in which she gave feedback on design ideas, recommended relevant scholarly articles, and reviewed the progress on our game.

The insights provided by Professor Hoover Green were invaluable. She reviewed everything from the clothing designs and appearances of our refugee characters to the game mechanics of accepting aid from foreign

diplomats. The perspective she provided enriched the project's accuracy and sensitivity. For example, when we were developing the appearance of the refugee characters and that of the aid worker (which is the player's avatar), we originally planned for them to look entirely different from each other. We had read research about how often camp managers are educated individuals from developed nations who look little like the refugees they serve, and we sought to emulate that representation. Professor Hoover Green, however, explained that circumstances where camp directors and camp inhabitants are culturally disconnected are far from ideal. She pointed us to UNHCR reports which highlighted the number of local volunteers and staff that work in their camps. She also correctly identified that it was far more important to forge an empathetic link between the player and the refugee characters, so they should have more similar in-game avatars. Discussions like these, along with input from our other advisors, helped us to incorporate thoughtful perspectives into our designs and make more informed decisions about how we wanted to present the game.

Building a Bibliography

The reading list that Professor Hoover Green provided to our team at the start of the project formed the backbone of the project's bibliography. This database of scholarly articles, agency reports, news articles, photographs, and personal stories was curated first by Professor Hoover Green, then by members of our team, throughout the game's development. It was used as direct inspiration for the game's mechanics and ensured concepts like resettlement, donations, and earmarking were factually correct. It also served as a resource for ensuring the accuracy of our building and prop designs as well as the refugees' dialogue lines.

Furthermore, the bibliography was integral in the creation of the in-game journal in *Resilience*. As players progress through the game, their actions (such as constructing a certain number of buildings) unlock journal entries that contain facts about refugees and refugee settlements around the world. These journal entries can be accessed from the main menu at any point during or after the game and are accompanied by citations from our bibliography. Each citation opens up in a new browser window with

the full source for further reading. In this way, we offer our players easy access to scholarly sources on the refugee issues that catch their attention. Together, our design team and Professor Hoover Green worked to ensure our refugee depictions—and all other aspects of our game—were well informed and empathetic.

Additionally, we were fortunate to get in contact with a field worker from Médecins Sans Frontières who worked in the Mediterranean region on rescue ships. He reviewed a demo of the game during our alpha development and gave feedback about the mechanics which then helped to shape later changes.

Reflections

While our research and the input from a field worker were extremely valuable, we recognize that these sources are no substitute for direct and frequent feedback from diverse people with lived experiences. Especially when examining the refugee testimonies curated on aid organization websites, one must remember that those organizations, since they are primarily reliant on donations from the wealthy Westerners, may select specific perspectives and narratives that are most beneficial to them (Cabot, 2016; Jones, 2019). Relying heavily on research from those aid organizations made this project susceptible to being filtered through those Western lenses, which at their worst show refugees as “feminized and infantilized images of ‘pure’ victimhood and vulnerability” (Sigona, 2014, p. 370). In retrospect, an excellent critique of *Resilience* is that we should have drawn much more from dissenting refugee voices about the mistakes made by aid organizations, which seldom appear in agency reports.

Despite our well-meaning intentions, our team’s lack of diverse refugee input during development placed several constraints on *Resilience*. As discussed in the next section, our limited access to diverse first-hand accounts was a driving factor of the narrative and visual direction of the game as we grappled with respectfully advocating on behalf of a group to which we did not belong.

To undertake the difficult task of research, we enlisted the guidance of an

expert on the subjects our game sought to address, and met with them regularly. We would offer the same advice of seeking out experts to other game developers, particularly to help guide a team's direction and efforts in areas of which they are less familiar. Whether these individuals have first-hand experience or published research, the informed perspective of an outside party can offer new insights into the strengths and weaknesses of the game. We also tried our best to draw our research from varied sources—from academia, to personal stories, to visual media. This is something that, given the opportunity to try again, we would certainly seek to improve, to ensure no voices are being muffled, distorted, or silenced. Finally, we had to know our research's limitations, and work to understand the consequences of these limits, and adapt our designs in response.

FICTION AND NARRATIVE

Mitgutsch and Alvarado (2012) characterize the fiction of a game as the “context” in which the content, information, and mechanics come together, providing a space for players to experience a story or create their own stories. These stories are deemed successful by the SGDA framework if they reinforce the game's overall purpose (Mitgutsch & Alvarado, 2012).

The story of *Resilience* takes place on Obios, an isolated moon in the fictional solar system of Archhaven. We follow the flight of a humanoid alien species called Murians as their home planet suddenly is engulfed by a black hole causing an intergalactic refugee crisis.

STORYTELLING THROUGH SCIENCE FICTION

One of the notable characteristics of the game's narrative is the science fiction setting. This sets *Resilience* apart from many other serious games about refugees, such as *Cloud Chasers: Journey of Hope*, *Bury Me My Love, Against All Odds*, and *Frontiers: Fortress Europe*, as these games take place in a recognizable Earth or near-Earth universe (Gabriel, 2018; Sou, 2017). The otherworldly setting in *Resilience* was designed to create a decontextualized neutral space through which the concept of humanitarian aid could be explored, without further appropriating or stereotyping real refugee stories.

Feminist and postmodernist literary studies have been published about how the unfamiliar environment of science fiction can be used to the author's advantage when trying to encourage empathy towards others. Wolmark (1994) postulates that in feminist science fiction works "there is a slippage between sameness and difference" (p. 28) caused by unfamiliarity that allows othered groups to be redefined. Gomel (2014) argues that by "defamiliarizing our commonly held beliefs" (p. 6) science fiction can challenge those beliefs and the morality that underpins them. Holland (2017, p. 68) describes this as a core element of science fiction:

"One of the most alluring qualities of science fiction is its ability to summon readers to actively imagine other realities—alternative futures, pasts, or parallel universes—and challenge normative assumptions through the invitation to suspend one's disbelief... Authors curate their stories to encourage their readers to question their own positionality, subjectivity, and humanity"

Our hope in creating this science fiction setting was to give space for players to leave behind any preconceptions about refugees they may have. In addition, we felt that this alternative scenery allowed us to highlight the broad themes of refugee life and aid organizations—without making exclusive statements about who refugees are, what part of the world they come from, and what their experiences are. Finally, and as previously mentioned, our lack of direct refugee input on the project meant that our team was not equipped to portray a genuine refugee story set in a fully realistic setting. We acknowledge that our position of ignorance introduced the real risk of misrepresenting a nonfiction story; there are invariably important details and emotional truths of an accurate and faithful portrayal only firsthand experience can provide. Our fictionalized abstraction allowed us to play to our strengths by using our research as a baseline, but also provided our writers the flexibility to substantiate the narrative with creative details.

DIALOGUE AND NARRATIVE THEMES

At the start of *Resilience*, the player is presented with a cutscene to introduce them to the Murians and the crisis that causes them to become refugees. At the end of this sequence, they are also introduced to their

role in the game and given a call to action. The player assumes the role of a Murian volunteer who works at one of the many refugee camps established across Archhaven and is tasked with camp construction and managing day-to-day operations. This framing is important, because prompting the player to be empathetic at the start of the game is one of the four principles Belman and Flanagan (2010) outline in *Designing Games to Foster Empathy*; without prompting, the player can play the game “unempathetically.”

Beyond the exposition in the opening cutscene, the player gains additional information about the Murians by speaking with them throughout the game. To give the player a small glimpse into refugees’ lives, the refugees’ dialogue pulls from a pool of over 1000 different lines. These lines can be hopeful or encouraging if the refugee is in good health and the camp is running well; the lines can also convey the refugees’ frustration, anxiety, or grief to reflect poor health or when the camp’s resources are strained.

Our process for writing dialogue had two primary objectives: first, to faithfully reflect our research on living conditions within refugee settlements; and second, to give each refugee in the game a sense of individual voice, thought, and personality. The writing process began with reading and abstracting stories from secondary sources (including refugee interviews, news articles, and visual media) and later synthesizing them with the sci-fi and creative elements that compose the world of *Resilience*.

To achieve our first goal of faithful representation, we chose to incorporate the overarching themes that were recurrent throughout our research. For example, many refugees have traumatic memories from the violence or destruction that caused them to flee their homes (Skretteberg, 2019; Wells, 2016). The Murians deliver dialogue lines that echo those stories, but they are reframed to reflect the Murian evacuation from the black hole such as: “I’ve been having a string of nightmares where I never quite make it out of the darkness” and “I still feel close to the people I lost. Even if they’re lightyears away.” During the harrowing process of fleeing the country, it is common for refugee families to become separated, especially when families can only afford to send half of the family (UNHCR, 2018; UNICEF, 2020). To illustrate this, many of our dialogue lines pertain to topics such as

searching for family members, mourning loved ones, and asking for news about siblings, parents, grandparents, or children.

To fulfill the second dialogue goal of providing each refugee a unique voice that felt humanized, relatable, and real, we designed the dialogue with varied vocabularies, tones, and topics. This creative decision also served to represent refugees' diversity in education, status, and age. For example, some of the dialogue lines provide the player with further insight into the game's galactic setting and lore. The dialogue for children has lines such as "This place is ginormous!" while adults say things like, "I'm intrigued by the strange landscapes here." Refugees are further differentiated through the personality or temperament conveyed by their speech. One refugee can decline to speak to you by saying, "It's been a pretty long day, I could just use some time alone" while another may say, "My my, you're certainly chatty today." The topics of their conversation also reflect the diversity of refugee experiences. They can range from polite greetings and mundane small talk, such as someone saying, "It's so chilly today", to serious reflections about the trauma of their experiences, such as a child saying, "My mother doesn't speak much anymore. It's like she's broken."

However, we recognized that we could not and did not intend to speak for all refugees and their experiences. There were some topics that we avoided deliberately because we did not have the experience to convey them sensitively or because we were concerned that including them would decrease the player's ability to empathize. Some of these themes included the use of smugglers to travel, the impacts of armed conflict and the presence of factions, and the high rates of domestic abuse and sexual assault within refugee settlements (Barberio, 2018; Mansell, 2016; UNHCR, 2018; Wells, 2018). Our aim was not to erase these realities with our narrative—in fact, the entries in our in-game journal addressed many of them—but rather to reconcile the impact of these stories with our primary goal of fostering empathy. For this reason, a majority of refugee stories are focused on concepts that would be familiar to our target audience, such as "I miss the quiet afternoons on our porch" and "Usually, I'd be in class around now." Figure 1 shows more examples of dialogue.

Hope for Resettlement	
“I hope the Resettlement Program got my application. I haven’t heard anything back yet…”	“I would like to end up somewhere where it’s safe for my siblings.”
News and Politics	
“Are you kidding me? I just read that the Celestial Citadel closed its border.”	“I remember seeing the refugees from Merridar on the news years ago. Never thought I would be one myself…”
Reminiscence & Restless Thoughts	
“I was just thinking about a family of birds that used to live by my old home…”	“We don’t read bedtime stories anymore. All our books were left behind.”
“My hometown was pretty large, but everyone knew one another. Here, people barely speak at all.	“The photos on my phone are all I have left of home.”
Capturing Voice	
“I’m still struggling to process the amount of Murians that are just… gone.”	“Tomorrow can feel so far away sometimes.”
“A few of us started a book club. Of course, we don’t have many books, but it helps to take our minds off the current situation.”	“My biggest concern used to be homework… Now it’s getting enough food.”
Personal Aspirations	
“I’m hopeful I’ll be able to attend university eventually.”	“I’m following my parents’ footsteps and training to be a teacher one day.”

Figure 1. Resilience Dialogue Samples

Reflections

The use of narrative proved to be a powerful tool that enabled us to humanize the Murians through their individual voices, integrate our research into the game world, and create engaging and emotive moments for players to build compassion for refugees. Although our team lacked firsthand experiences, we attempted to address this by pivoting our narrative to a decontextualized science fiction setting that could still reflect the truths from our research. Early on we established the scope of our storytelling—the topics we could and could not speak to, the details we felt were most essential to the objective, and the ways we could supplement stories without appropriation. With our key objectives and design pillars in mind, we continually iterated our writing, dialogue, and lore to present

insight into life within refugee camps without deliberately or inadvertently speaking on behalf of a group to which we did not belong.

During our development process, we organized our narrative and research deadlines to ensure our narrative was established on a solid foundation of research. As we began collecting a diverse catalog of sources, we also derived inspiration for developing the setting and themes of our narrative. That said, successful representation of such research does not necessarily mean constraining the game, narrative, or visual depictions to realism. Where relevant, we took into consideration the advantages and disadvantages our fictionalized narrative provided us. For our purposes, abstraction was a helpful device in converting difficult topics into more approachable themes. We would advise other teams to similarly use abstraction as a tool to avoid reinforcing stereotypes or appropriating sensitive stories. However, designers should take proactive measures to ensure that core ideas are not diluted or distorted to the extent that any original meanings are lost. While details can be altered to adhere to the game's context, it is equally important to preserve the emotional truths and factual accounts of the research that backs them.

AESTHETICS AND GRAPHICS

Mitgutsch and Alvarado (2012) broadly define this pillar of the SGDA to be all of the “audiovisual language” employed in the game’s design, including aesthetic characteristics, imagery, style preferences, artistic media, and the computer graphic techniques.” In the SGDA, the authors emphasize that because these elements are the first and primary impressions of the game a player will have, these aspects of the design have “a fundamental role in the introduction of the game’s purpose and its impact on the player” (p. 126). Our research and the science fiction setting of our narrative were crucial to establishing the visuals of *Resilience*.

Visualizing the Camp

In our research and design discussions with Professor Hoover Green, she identified that one of the biggest struggles with refugee camp management was dealing with settlements built from temporary and cheap materials

like mud bricks or tarps (Khadka, 2019), and equipment that was out of date or broken (Bond, 2018). Given the science fiction overtone of our setting, we opted not to use tarps or mud brick, but instead created materials that still felt like they were cheap, old, modular, mass-produced, and far from that of cutting-edge technology. From the buildings to the rocket ships that refugees arrived on, the equipment was intended to come across as worn and outdated. To further this motif, we chose to adapt a specific type of retrofuturism called cassette futurism (or cassette punk) into the camp's architecture. This style is characterized by taking influence from 70's and 80's product design, with "loud, bright colors and geometric shapes" (Cassette Futurism, n.d.), and silhouettes inspired by devices like microcomputers, film cameras, and of course, cassettes. For example, the design of our 'Hygiene Pods'—modular single-person bathrooms—was inspired by the appearance of disposable film canisters, while the beige paneling of the 'Housing Unit' was drawn from early personal computers. Figure 2 illustrates the Hygiene Pod design.

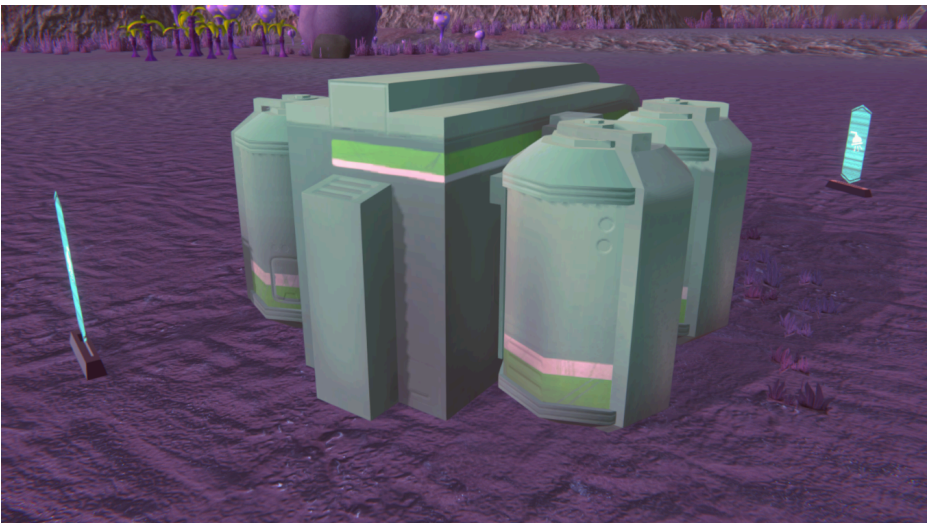


Figure 2: Hygiene Pods

In addition, each building's design incorporated signs of wear and tear: small scuffs, dust, streaks of rust, and scratches. We wanted the player to perceive the camp's technology as futuristic and fitting for a science fiction

universe, but at the same time, recognize that it was also outdated and on the verge of breaking.

Depictions of Refugees

One of the most important artistic choices in *Resilience* was how we chose to portray the refugees themselves. When the game was first pitched to our art team, it was originally going to portray human characters in a fully realistic setting, such as Syria or Myanmar; however, our artists quickly objected. They were uncomfortable with the idea of trying to realistically depict people from cultures that no one on the team was from. Just as with the narrative design, there was genuine concern of misrepresenting important details and being unintentionally offensive—of committing cultural appropriation or perpetuating harmful stereotypes. According to Vasalou et al. (2014), “cultural appropriation occurs when game designers decontextualize cultural history, expressions or artifacts that belong to a culture that is not their own, in turn recontextualizing them into game structures” (p. 267). We considered the three main strategies Vasalou et al. offer to game designers to avoid cultural appropriation in a work: *domesticating*, in which the unfamiliar cultural details are swapped out for more familiar ones; *foreignizing*, in which the unfamiliar cultural details are preserved as best as possible; and *ambiguifying*, in which the cultural details are purposefully obfuscated. We chose to pursue the *ambiguifying* strategy because it best fit our team’s skills and our game’s goals.



Figure 3: Murian

In *Resilience*, the refugees and camp staff were all part of an extraterrestrial species known as Murians as Figure 3 shows. The humanoid Murians were designed by our art team to appear friendly, emotive, and empathetic, while also having their own distinct identity. The main physical differences that set Murians apart from humans are their elongated digitigrade feet, extra thumbs, thinner and taller frames, extra set of eyes, rounded cat-like ears, and a cat-like nose atop their forehead. The feline inspiration for their features was deliberate as a means to encourage players to empathize with them and care for them. These characteristics were further emphasized in the Murian children, since we wanted their endearing qualities to evoke a strong urge for players to protect them. The Murians also don their own ensemble of ethnic fashion that was collectively synthesized from science fiction works and various garments from around the world. Refugees in *Resilience* wear a combination of fabrics, layers, draperies, patterns, beads, and other ornamentation which hint at their rich culture without directly corresponding to any specific culture on Earth. We believed it was important to depict the Murians with varying articles of clothing to reflect their society (albeit in a culturally ambiguous way) and in reference to the customs, arts, and lifestyles refugees may be forced to leave behind in unfamiliar territories.

Since the Murians are understood to be an ambiguous representation of refugees, we avoid making normative statements about the types of people who are and are not refugees. We did not want to further stereotypes about who refugees are and what they look like, and chose to explore ideas of how anyone, not just the people we typically think of, can become a refugee.

Although it afforded advantages, we must also reflect on the downsides to this portrayal. Dehumanizing refugees is a common tactic for people who are trying to distance themselves from, disparage, or harm refugees and immigrants, such as when they are called “hordes,” “floods,” or “illegal aliens” (Eberl et al., 2018; Motal, 2015; Warnock, 2019). We acknowledge that our depiction of refugees as literal aliens may seem to be reinforcing those ideas, and therefore could be perceived as offensive. We remained aware of this concern during the game’s development, and took steps to try to dissuade a dehumanizing interpretation. First, the player character is also a Murian, a fact that the player is reminded of through dialogue with refugee characters that evokes kinship (e.g., “Hah! For a moment there you looked like someone I know.”). This is further reinforced whenever the player looks down at their own two-thumbed hands. We hoped that having the player be a Murian would break down in-group out-group barriers and help assuage any concerns about “othering” the refugees. In addition, we went to great lengths to make the Murian refugees possess diverse and individualized qualities, so they did not seem like a mass of undifferentiated “others.” During gameplay, refugees are generated with randomized characteristics such as height, build, skin color, clothing styles, clothing colors, and ornamentation were all randomized within presets to ensure every single refugee looked like a unique individual. Finally, as mentioned above, the dialogue also serves to differentiate the refugees and establish them as empathetic figures. However, despite our best efforts to avoid negative interpretations of our alien refugees, in the end it is the player and not the creator who interprets a game’s design. We acknowledge there is still the possibility of misinterpretation or offense due to our design choices.

Reflections

Reflecting on our decision to portray our refugees as ambiguous alien characters brings both the advantages and the downsides into sharp relief. We found the three strategies proposed by Vaslou et al. (2017) for avoiding cultural appropriation—domesticating, foreignizing, or ambiguifying—to be useful as we attempted to portray a culture different from our own. These strategies enabled us to think critically about which solution would best serve the goals of our game and complement our team’s talents. We found success leaning on our science fiction setting as an ambiguous, unfamiliar neutral space through which players could refamiliarize themselves with refugee identities; however, we also acknowledge that this portrayal has limitations. As designers, we realized it is always critical to be cognizant of how our choices to abstract identity may not be interpreted in the way we intended by our audiences. Ultimately, whether a project uses realism or abstraction to depict a subject, the highest priority should be to do it in an informed and respectful manner.

MECHANICS

Developing mechanics is one of the most important aspects of serious game design, since it provides an opportunity for commentary that is unique to games. Mitgutsch and Alvarado (2012) define mechanics as the interactive actions afforded to the player, describing them as the “establishment of the rules that define the possibility space for operations in the game world” (p. 124). As denoted by Bogost (2008), these possibility spaces carry their own rhetoric based on what they allow, disallow, reward, or discourage. A designer can offer supporting arguments or sharp criticism of systems present in real life by creating game mechanics that reflect those systems. In doing so, the design can enable the player to manipulate those simplified realities and observe the direct consequences (Bogost, 2008).

Game Genre Selection

One of the key aspects to a serious game’s success is ensuring the “verbs of

the game” match closely to the stated goals of the serious game (Mitgutsch & Alvarado, 2012). The goals of *Resilience* were primarily to establish empathy for displaced people, but more specifically, offer commentary about life in refugee settlements and encourage players to take action to improve refugees’ lives. We wanted to establish the need for steady non-earmarked funding, provide commentary on overcrowding, and highlight the importance of resettlement as a permanent solution. To accomplish this, we chose to make *Resilience* a city-builder game.

The city-builder genre is characterized by managing a built environment populated by independent non-player characters (NPCs) who demand resources from that environment which the player must manage with limited means (Korppoo, 2015; Plumley, 2018). The player interacts with the game by spending resources to commission the construction of buildings and monitoring the condition of the NPC inhabitants to make sure the built environment is sufficiently meeting their needs. This game loop is described by Korppoo (2015, p. 18):

The core of the game play is to observe and study the city to find out, via visual clues and/or information overlays and messages, what could use improving, or if there are problems or new opportunities. After observing, the player builds or manages to handle the problem, then again observes if the problem is corrected and what kinds of effects it has on the city.

City-builders inherently encourage trial-and-error gameplay where players are constantly reacting to feedback from the NPCs with the goal of progressively improving their building efforts. These core mechanics were well-suited to the learning objectives we established for *Resilience*. We wanted players to care for refugees and understand the struggles of managing a refugee settlement; therefore, we put them in charge of constructing a camp themselves.

City-builder games have a long history of being used as educational tools within the field of civic engineering (Plumley, 2018). As a result, we knew the genre could foster the type of strategic thought and systems analysis we wanted the players to apply to refugee camp management. Through this lens, the player would feel the burden of an overcrowded camp directly and would also experience relief when they were able to resettle refugees and reduce crowding. The player’s main objective is to keep the camp

running for a set amount of time (40 minutes in the main game, or 20 minutes in the demo version), while also providing the camp with sufficient housing, food, water, hygiene facilities, and hospitals. We wanted players to feel the pressure of a tight budget, so the funding the player receives is barely enough to pay for necessities. The player often will have to make decisions between building sufficient housing and having enough water or hygiene facilities. If the refugees' needs for shelter, food, water, and hygiene are not met by the infrastructure, they will fall ill; if they cannot get medicine fast enough, the refugees will die. To keep the focus on the refugees' wellbeing, the player immediately loses the game if more than twelve refugees die. This frames *Resilience* as a struggle for survival, which, unfortunately, reflects the reality of camps with inadequate resources—where treatable diseases like malaria claim the lives of too many (Bond, 2018; Skretteberg, 2019).

Diplomacy and Earmarks

Throughout the game, the player is contacted by characters representing diplomats from other alien nations willing to offer aid. A diplomat can offer the player a choice between a few minor benefits such as small amounts of funds or supplies, and, very rarely, the opportunity to resettle a few refugees. This mechanic reflects the reality faced by aid organizations like the UNHCR in which the funding they are given is not enough to satisfy their budgetary needs and the resettlement opportunities provided meet less than 10% of global refugee need for resettlement (UNHCR, 2019b).

Occasionally, a diplomat also may offer earmarked funds, which is when they put forward some money but only under the condition that the player builds a specific type of building (such as housing) within a specified time frame. If the player fails to meet this condition by the end of the time frame, they must return the money with an added fee. The money provided to the player is almost always insufficient to actually satisfy the requirement; consequently the player is forced to either decline the extra funds, or divert some of their money away from their current building plans and put them toward the diplomat's demands (which may or may not align with their current needs). We introduced this earmarking game mechanic to represent government or private donations that designate

money toward specific people or areas that receive a great deal of news coverage, but neglect lesser known disasters and cause shortages of funds for those “forgotten crises” (UNHCR, 2019a). This is, of course, not an accurate representation of the much more complex accountability and budgetary restrictions that real aid organizations face. Earmarks are usually devoted to specific regions or peoples and failure to meet the earmark is not punished by deducting funds (UNHCR, 2019a). We deliberately chose to abstract our portrayal to evoke the same frustration and helplessness felt by aid organizations unable to freely spend their funding. Our implementation was intended to be more intuitive so players would not get bogged down in the intricacies of international agency budgetary concerns.

Deviations from the Genre

There were some aspects of the city-builder genre that did not fit as well into our desired goals for the game, and we had to go to great lengths to alter our game’s design. The largest challenge we grappled with was maintaining a close and empathetic connection between the player and the refugee NPCs. The two most popular city-builder games currently, *SimCity* and *Cities: Skylines*, feature a top-down bird’s-eye view of the city that removes the player from being a part of the city; it relegates them to a god-like character in the clouds (Plumley, 2018). From this perspective, the hundreds or even thousands of NPC residents are low-fidelity specs—more like ants that scurry around in the city below. Consequently, the degree to which the player can zoom in and see detailed features is limited, as is their ability to focus on an individual NPC long-term and empathize with them (Plumley, 2018).

To avoid and counteract these depersonalizing effects, we had to alter several mechanics that are hallmarks of the city-builder genre. First, we limited the size of our refugee settlements. The maximum number of refugees in the game is only 500, making *Resilience* small for a city-builder (Plumley, 2018). We wanted the small settlement to still feel overcrowded and unmanageable when the player did not resettle refugees, but at the same time, we did not want so many refugees that the crowd felt like a faceless mass. Second, we changed our camera angle. Instead of making

the default perspective top-down, which would have removed the player from the people they were impacting, *Resilience* was designed to have a default first-person camera mode. We gave the player character a diegetic tablet which uses fictional map software to provide a bird's-eye view for the purposes of building. Whenever the player looks down at their tablet, they see their character's hands gripping the sides of the tablet to remind them of their connection to the rest of the camp, as Figure 4 shows.

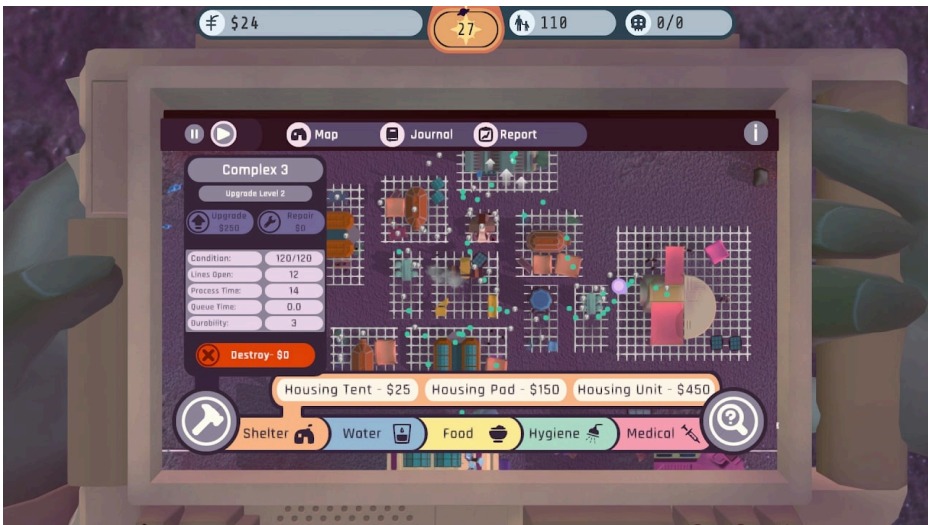


Figure 4. Tablet Map Interface

However, even after making those two changes, we were still concerned that players would spend all of their time in the tablet perspective (depicted above) if we did not actively encourage them to maintain a rapport with the camp's inhabitants. In our final departure from typical city-builder mechanics, we added the information gathering system. By default, in most city-builders, gathering information is a passive process, in which pop-ups, overlays, and heat-maps are always at a player's fingertips and are continuously updated as the city changes (Korppoo, 2015). In *Resilience*, the only information a player immediately receives about the camp is a notification when a refugee dies. Otherwise, the only way the player can obtain updated information is by speaking directly to the refugee NPCs. Upon being spoken to, the refugee will say a short line of dialogue about their own condition and needs; if none of their own needs are pressing,

they will say a line of dialogue reflecting on their thoughts, worries, or aspirations. NPCs will also give an update on the condition of their neighbors. This way, players are encouraged to regularly reach out to refugees but do not need to speak to every individual to gain a complete picture of well-being in the camp. Players also have access to an overview of this information on their tablet, but information disappears if no one in that community has been spoken to in the last few minutes of play. In this way, we ensure players must continue to engage directly with refugees and listen to their opinions and stories to run their camps efficiently and well. This final change, in parallel with the other deviations we made from the typical city-builder genre, was crucial to maintaining empathetic connections between the player and the refugee characters.

Reflections

When designing the mechanics for any serious game, it is vital to ensure that the verbs of the game match the intended goals, per Mitgutsch and Alvarado (2012). Every mechanic and sub-mechanic in the game can be an opportunity to evoke a sentiment or further a learning outcome. By pushing players to engage with systems that are intentionally designed to convey a message, the core ideas of the game are reinforced in an engaging and interactive way. We found it useful to base our game design on an existing genre that best fit our learning goals, thematically and mechanically, however, we also took certain design liberties to avoid solely constraining our game by the conventions of the genre. Breaking these standards deliberately allowed us to push specific ideas further in an effort to create a positive impact. We also made it a priority to ensure that the mechanics were still engaging to the player. Frequent playtesting and iteration were vital to develop engaging and impactful mechanics as well as their optimal presentation.

FRAMING

Framing is the sixth and final core element proposed by Mitgutsch and Alvarado (2012), which they describe as the relationship between the

player and the game, including aspects like the target audience and the game literacy required to play the game.

Game Literacy and Difficulty

Mitgutsch and Alvarado (2012) specifically call attention to framing because they found game literacy, in particular, was “frequently overlooked” (p. 126). In addition, research by Huang and Tettegah (2010) shows that there is a negative relationship between the complexity of a game’s systems and the player’s ability to form empathetic connections to the game’s subject matter. Extrapolating from cognitive load theory, they postulate that the more a player’s mental energy is used to analyze and respond to a game’s mechanics, the less it can be devoted to empathy (Huang & Tettegah, 2010). Failing to analyze a game through this lens can lead to less effective outcomes if the target audience is too overwhelmed or confused to play the game.

Balancing the player’s cognitive load was an area of sharp concern for us throughout the development of *Resilience*, as we wanted our game to target a broad audience; however city-builders are complex games that can be difficult for new players (Plumley, 2018). We wanted *Resilience* to be a challenging game because we did not want to trivialize the difficult job of refugee camp management, but we also wanted the game to be accessible for players of various skill levels. During some of our early playtests, we observed difficulties with game literacy and cognitive load in action. Some players struggled to use the game’s controls, while others were so focused on the technical aspects of the game (such as population metrics and building placement) that they failed to connect with the refugees and recognize how the mechanics represented issues in the real world.

Some of the efforts we made to overcome these shortcomings were to simplify, shorten, and thoroughly tutorialize our game experience. As touched upon in the mechanics section, there are many ways *Resilience* is smaller than a typical city-builder. There are fewer NPCs, fewer unique types of buildings to construct, and the game session is shorter overall. Unlike *SimCity* or *Cities: Skylines*, in which game sessions often last hours (Korppoo, 2015), the full game of *Resilience* is limited to 40 minutes. In cases

where complexity was unavoidable, such as the challenge of navigating the game in both a first-person and top-down perspective, we made the game more accessible with our tutorial, which offers inexperienced players a gradual introduction to the game's controls, screens, and mechanics.

CALL TO ACTION

Although the presence or absence of a call to action is not specifically addressed in the SGDA (Mitgutsch & Alvarado, 2012), it is an integral part of the audience experience of a serious game. According to Belman and Flanagan (2010), encouraging a player to feel empathy for the suffering of another without giving them a course of action or an outlet for those emotions is likely to leave them feeling “burned out” and frustrated. That is why the authors' second main principle for creating serious games that evoke empathy is to leave the player with a strong call to action (Belman & Flanagan, 2010).

No matter whether they win or lose *Resilience*, players are greeted with a grounding but encouraging message that reminds them that while real refugee camps all over the world face difficult conditions, they can take actions to try to help. Players are shown a montage of photos of refugees, and given three concrete ways to help: staying informed, donating, and voting. The details on this call-to-action screen came from extensive research and conversations with our project advisor, Professor Hoover Green. We knew our game tackled a heavy subject matter, so we wanted to leave our players with concrete and actionable steps, as well as a feeling of urgency rather than a sense of hopelessness.

Reflections

When designing a serious game, a designer must think long and hard about how the target audience will experience the game. How will they know how to play it? How will they feel as they walk away from it? If a game hopes to succeed at getting across a message, it must be accessible to the target audience, and not so complex that its core message is lost or unclear. Onboarding the player with a tutorial and/or intuitive gameplay systems is also vital to ensure that players are adequately equipped to

engage with the entire experience. It is not necessary to metaphorically hold the player's hand throughout the experience; ideally, the game should take into account the varying skill levels of its players, and be forgiving for those who find the game challenging while rewarding those who excel at the game. In addition, if designers hope to foster empathy for others in difficult situations, it is important to also consider how the player's emotional experience is being framed, and whether the player is left with actionable items, or simply exits the game feeling burnt out or distressed.

CONCLUSION

Developing *Resilience* as our senior project was an immense undertaking and continual learning process from start to finish. Throughout the production, our team was challenged to find creative solutions to technical, ethical, and design problems of all sizes. As we strove to complete the game while preserving our core message and objectives, we aimed to foster thoughtful discussions, recognize our limitations, and play to the strengths of our team and what we learned from our research. This postmortem draws out the lessons we gleaned from building *Resilience*, lessons that emphasize the frameworks and approaches in the field (e.g., Belman & Flanagan, 2010; Mitgutsch & Alvarado, 2012) and expand upon them in this context of designing a game to create empathy for the refugee experience.

Intentional design is of utmost importance and should be considered at every stage of development. To design a serious game intentionally, we recommend the following:

- Early on, ask important questions about the overarching objectives to allow these goals to permeate through the entire game.
- Find experts on the game's topic/s and seek out their feedback throughout development.
- Use a wide variety of sources to ensure diverse perspectives are being considered.
- Recognize the limitations of available research and be prepared

to adapt the game's design in response.

- Make the themes of the game more accessible by using tools such as abstraction. However, take care not to dilute or distort core ideas.
- Pursue steps to avoid cultural appropriation. Especially when abstracting identity, consider possible interpretations of the team's decisions. Tact and respect, especially when dealing with human issues, are the highest priority.
- Match the verbs and core player actions of the game with the team's intended goals. Reinforce these core messages through intentional mechanics. Base the gameplay on an existing genre, but do not be afraid to break the mold to better connect players to content.
- Playtest frequently for game mechanics and learning outcomes.
- Prioritize accessibility for the game's target audience. Do not overcomplicate the core message with complex mechanics. Help players learn the game by building out tutorials.
- Empower players to take real-world action on behalf of the subject of the game by leaving them with a strong call to action.

Lastly, think critically. What worked for *Resilience* may not apply to all other styles of games. By taking care in every aspect of the game design, the team can ensure that the story is being told responsibly and with the greatest impact.

Looking back at what we set out to accomplish with *Resilience* as student designers, and the approaches we took to build and iterate on the game from initial concepts to the final build, our project was not without its share of limits and shortcomings. We would be remiss not to acknowledge that the lack of diverse refugee input and omission of certain themes shaped *Resilience* into a narrower portrayal of the issues we sought to address. There are certainly instances in which our own concerns and reservations permeated into creative decisions and areas where further outreach could have enriched our perspective as designers.

Still, we are proud of the game we were able to create and the individual successes we experienced in our execution. Our team took great efforts to design in response to a sensitive subject matter, interweave an array of research types, and create compelling and empathy-oriented gameplay for players. We hope that our experience developing *Resilience* can be a resource to others interested in approaching the topic of portraying displaced peoples in games (and serious game design as a whole) to craft impactful, respectful, and informed experiences.

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