Balancing Fun and Seriousness

Serious Game Design Considerations

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Much research has been done on the design procedure and principles for serious games. However, those studies rarely account for the balance between the fun elements and the serious purpose of the games or lack the specific steps for achieving such a goal. This paper outlines game design considerations in the development of a serious game aimed at enabling both hedonic and eudaimonic gaming experiences. A user study was conducted with 89 players to evaluate their gaming experiences. Results of the playtests showed that the game was able to achieve a good balance between hedonic (fun and pleasure) and eudaimonic (serious and purpose) experiences. Lessons learned and specific design recommendations for improving the current design are further discussed.

Keywords: Serious game design, persuasive game, enjoyment, playtesting, evaluation

Serious games, broadly defined as games for specific purposes, typically aim to train, educate, or persuade players to think and/or behave in a certain way. One primary concern in the field of serious games is in balancing and integrating two competing experiences: for players to have fun while still being able to teach, train, or persuade effectively, termed as hedonic and eudaimonic enjoyment respectively by Oliver and Raney (2011). Research has suggested that serious games are more effective when both fun and serious aspects are appropriately blended (Pisan & Tan, 2012; Sicart, 2011). However, serious games often elaborate on the serious (eudaimonic) aspects and place much less emphasis on the fun (hedonic) aspects of games (e.g., DeSmet et al., 2014; Shen et al., 2009). Research has attempted to introduce approaches for game design that connect both the serious (eudaimonic) and fun (hedonic) aspects of games (e.g., Carvalho et al., 2015; Ibrahim & Jaafar, 2009). However, existing recommendations tend to be analysis-focused, lacking practical use-case examples, and largely situated within the domains of instructional design.

Carvalho et al. (2015), for example, proposes the activity theory model, linking pedagogical elements with gameplay, with usability as a primary focus. Although this model can be used for conceptual design, the example presented in their paper utilizes the model to analyze an existing game, rather than to design games. Similarly, Ibrahim and Jaffar (2009) propose an educational game design model combining game design, pedagogy, and learning content modelling following a review of existing frameworks. However, they do not elaborate on how the facets of their game design model can be achieved through the game design process and do not provide any example use-case of their proposed model.

Additionally, despite an agreement that there should be a balance of serious and fun in serious game design, studies often place greater emphasis on analyzing serious outcomes, rather than player experiences (e.g., Franzwa et al., 2013; Starks, 2014). In a study by Franzwa et al. (2013), an engineering-related serious game was developed based on narrative-learning synthesis and scaffolded by supplemental feedback and player guidance, which the authors proposed as a means of balancing fun and learning. They briefly explored fun in their evaluation of the game, measured in comparison to textbook learning. It lacks a baseline measure of fun. Starks (2014), in proposing the Cognitive Behavioural Game Design model, posits that the enjoyment process should be a key consideration in linking theoretical concepts to game design principles. However, it tends to assume certain elements as enjoyable (e.g., challenge, persistence, flow), while it is not entirely clear whether players actually perceived it as enjoyable or fun. For instance, challenges that exceed players’ skill thresholds can be detrimental to enjoyment (Nakamura & Csikszentmihalyi, 2009), and Shen et al. (2009) noted that despite the tendency to assume...
that gameplay is to provide enjoyment for players, many serious games are not actually perceived to be enjoyable by players.

To address the weaknesses in current serious game design literature, this paper first identifies commonalities in entertainment game design processes for creating fun experiences, as well as psychological theories that contribute to meaningful and persuasive experiences as guiding design principles. We then outline its application in designing a serious game. Iterative evaluation of the hedonic and eudaimonic gaming experiences was conducted to examine if the game achieved the balance between fun and meaningfulness. Recommendations are then provided for improving the existing serious game design.

**Design for Hedonic and Eudaimonic Experiences**

A general game design process in entertainment games often starts with conceptualization, which frames the core objectives and main direction of the game (e.g., Adams, 2014; Schell, 2008; Macklin & Sharp 2016). It is followed by an elaboration phase (Adams, 2014) where the concrete details of the game are decided. After the concrete gameplay was designed, iterative prototyping, and subsequently playtesting can be carried out to design, test, and determine if the intended player experiences are being achieved (Salen et al., 2004). Playtesting gathers players’ feedback and data (e.g., usability, performance). Iterative evaluation also takes place at the same time to analyze the obtained feedback and data, and to inform design improvements and future recommendations (Adams, 2014; Macklin & Sharp, 2016). Game engagement is typically used to evaluate the hedonic aspect of the game design (Wiemeyer et al., 2016).

With regard to designing for eudaimonic gaming experiences, prominent work in persuasive game design has discussed the specific mechanisms of persuasion in game design, ranging from procedural rhetoric utilizing rule-based game interactions (Bogost, 2007), to more adaptive personality-based approaches (Orji et al., 2017). Studies following such tradition were criticized for mainly focusing on how to incorporate persuasive messages into the game (Pisan & Tan, 2012; de la Hera, 2013), without considering the role of player agency (Sicart, 2011) or player experiences.

To overcome these criticisms, this paper proposes a psychological theory-based and player-centric approach to design games for persuasion. Instead of inserting persuasive messages into the game, it aims to activate players’ agency to make choices through the game dialogues and persuasion takes place through players’ experiences - that is to consider the persuasive strategies, game mechanics, and players’ psychological reactions toward serious games simultaneously in the game design processes. These processes follow four main phases: conceptualization, elaboration, iterative prototyping, and playtesting and iterative evaluation. In each phase, specific hedonic and eudaimonic considerations are also discussed.

**Designing the Serious Game Hire Up**

**Conceptualization**

To aid conceptualization, Schell (2008) proposes four interrelated core game design elements in (1) mechanics, (2) story, (3) aesthetics, and (4) technology that can be used as a guide for brainstorming game design elements. Mechanics define what players can do to achieve the goals of the game and determine how players progress through the sequence of unfolding events (story) in a game, while also being augmented by aesthetics (e.g., look/feel) and technology (residing medium of game elements) (Schell, 2008). The key aim of the conceptualization phase is to determine how these elements gel together to make a game enjoyable. Hire Up was conceptualized as a single-player management simulation game. One of the objectives of Hire Up was to observe how individuals make decisions in situations with moral implications. Simulation games provide a somewhat accurate representation of external reality and real-world activities (Dorn, 1989), which allows scenarios involving moral choices to be presented to players in a concrete and coherent manner. It can potentially obtain realistic responses to the presented situations. In the game, the player takes on the role of the boss running a food establishment in Singapore and makes management and hiring decisions. The main mechanics include real-time decision making in the form of stall management, hiring processes, issue resolution, interactive dialogues, game choices, and mini-puzzles.

Story progression in the game is facilitated by these mechanics alongside persuasive narrative interwoven into decisions and choices players must make. Vikaros and Degand (2010) argue that narratives in video games are a good medium to deal with moral values and development because people rely on morality to make decisions and judgments in everyday life, as well as in the game. Studies have found that acting immorally could also evoke prosocial outcomes (Weaver & Lewis, 2012; Hartmann et al., 2010). Moral decisions made in video games could provide opportunities for reflection on how those choices and behaviors should have been (Weaver & Lewis, 2012). Hence, in this game, mechanics and gameplay sequences were primarily used to advance and structure the interactive narrative players would experience. To supplement the narrative, visual aesthetics were designed to be reflective of the situation and context being portrayed. For example, the environment, stalls, workers and layout were reminiscent of an air-conditioned food establishment in Singapore. Lastly, the game was designed to be web-based and largely platform and operating system agnostic to accommodate a larger and more diverse audience.

**Elaboration (Gameplay Decisions)**

Following conceptualization, decisions were made on gameplay sequences and interactive choices presented to players. To facilitate enjoyment in a game, Koster (2005) suggests that fun in games arises from comprehension and mastery, and players have to be appropriately challenged in gameplay sequences. In Hire Up, challenges for players arise from making moral choices, derived from Moral Foundations Theory (MFT) (Graham et al., 2013),...
which affect the overall economy of the game and their in-game success. The MFT proposes that people make moral judgments according to the importance of six moral foundations: harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect, purity/sanctity, and liberty/oppression (Haidt, 2012; Haidt & Joseph, 2008). These moral foundations act as dispositions to guide intuition in human moral judgment and decision-making, which in turn influences attitudes. Instead of engaging in rational argumentation, making a choice can be intuitive and automatic based on moral foundations. Research has found that players tend to avoid decisions that could violate moral foundations which are salient to them (Weaver & Lewis, 2012; Hodge et al., 2019). On the other hand, people who commit immoral actions in video games could experience heightened feelings of guilt after gameplay (Mahood & Hanus, 2017; Allen & Anderson, 2019). These studies suggest that engaging with moral choices in video games could prompt players to reflect upon their choices and relate those decisions to their personal values and emotions. Furthermore, these choices could challenge players to think critically on game play decisions that could potentially violate various facets of moral foundations, contrasted with more practical decisions, each affecting the performance of the food establishment in different ways (e.g., choosing to hire a worker based on merit and experience vs. external factors; or taking a monetary loss vs. looking out for the well-being of a worker).

To ensure that players had the freedom to make these choices and still be able to enjoy the game, considerations were made for how these choices affected the game economy in terms of rewards and punishment and how players could recover from punishing situations (Schell, 2008). Although certain decisions made (e.g., sending a worker home for the day) could negatively affect their game income, players were given alternative means of regaining lost funds through an optional mini-game. In addition to providing a challenge for players, Elson et al. (2014) argue that game choices allow players to build personal connections. In the process of choosing and not simply following a prescribed game story and/or dialogue, players apply their own values. The game story and experience will likely be perceived as meaningful by players. These meaningful game choices push players to tackle complex issues such as moral dilemmas and conflicts between values (Iten et al., 2017) and therefore influence players’ thoughts and feelings (Green & Jenkins, 2014; Steinemann et al., 2017). Badly designed choices, however, can also affect player enjoyment in three ways: decisions being deemed as arbitrary, uncertainty relating to the goal of the decision, and decisions lacking a clear outcome (Salen et al., 2004). Hence, in Hire Up, players were provided with a clear rationale behind each choice they needed to make, informed how these choices would affect the game, and presented with both short and long-term consequences of the choices.

In the game, players were required to set up the stalls in the food court and hire workers based on their subjective assessment of the given profiles. Players were presented a series of narrative-driven quick-time events involving dialogue with hired workers across an in-game time span of one week. In these quick-time events, players had to make moral choices that could affect the operations of the food court, or the well-being of the workers. Following each moral scenario, players were given some immediate feedback on the consequences of their choices, aligning with the goal of having players reflect upon their decisions and feelings of guilt to enable persuasion. At the end of the game, players were asked to adjust the workers’ salaries based on their perception of each worker’s performance. They were also presented with a list of their in-game achievements and the delayed consequences of the moral decisions they made in the game.

### Iterative Prototyping

Six moral scenarios involving interactive dialogues targeting each moral foundation were written and integrated into the gameplay flow. An example of moral scenario included one where players had to decide between asking an injured worker to rush or not rush an order for a customer who was about to be late for an appointment. An initial prototype was created based on the originally designed mechanics, game play, and narratives. For the initial prototype (See Figure 1), the goal was to gain a preliminary understanding of overall player experience, how players would interact with the game, as well as whether the designed moral scenarios achieved the intended outcomes. Based on results of playtests later, the prototype went through various iterations.

![Figure 1. Screenshot of video game Hire Up](image)

### Playtesting and Iterative Evaluation

A two-phased playtest was conducted to examine players’ gaming experiences and identify issues on usability and gameplay. Modifications were made to the game after the first playtest based on iterative evaluation. Details of the game modifications are included in the discussion section.

### Method for Playtests

**Participants.** A total of 89 participants (47 females, 42 males) aged between 18 and 56 ($M = 23.40$, $SD = 6.33$) were recruited through convenience sampling for the playtests. There were 39 participants (18 females, 21 males), with an average age of 23.36 years ($SD = 2.83$) in Phase 1 and 50 participants (29 females, 21
mores), with an average age of 23.56 years ($SD = 7.99$) in Phase 2. Participants who were recruited for the first phase were not eligible to participate in the second phase.

**Design.** The questionnaire and game were hosted on the survey platform Qualtrics. Participants met with a researcher at a private quiet space to conduct playtests. After providing informed consent, they played the game for about 20 to 30 minutes. Participants were told to think aloud, and the researcher asked participants about their game decisions and thoughts during the gameplay. The gameplay was screen recorded. After completing the game, participants filled out a post-game questionnaire.

**Measures.** Hedonic and eudaimonic experiences were measured on a seven-point Likert scale (1: Strongly Disagree; 7: Strongly Agree). Hedonic experiences measures include mastery, immersion, curiosity, challenge, and ease of control adapted from Abeele et al.’s (2020) Player Experience Inventory. Sample statements included “I felt capable while playing the game” (mastery), “I was immersed in the game” (immersion), “I wanted to explore how the game evolved” (curiosity), “The game was challenging but not too challenging” (challenge) and “I thought the game was easy to control” (ease of control). Perception toward game narratives was measured by adapted items from Phan et al.’s (2016) Game User Experience Satisfaction Scale (GUESS). Sample statements include “I enjoy the fantasy or story provided by the game.” Eudaimonic experiences were measured by meaningfulness of gameplay, autonomy, guilt, and ratings of the moral foundations in the dialogue. Meaningfulness and autonomy were measured by 3 each, adapted from Abeele et al. (2020). A sample item for meaningfulness included “Playing the game was meaningful to me”, while a sample statement for autonomy was “I felt like I had choices regarding how I wanted to play this game.” Guilt was measured using three items (Hartmann et al., 2010) on a five-point Likert scale (1: Rarely/Never; 5: Very Often) including adjectives such as “guilty.” To see how much players recognize the various moral foundations, they were asked to rate the degree to which the six different moral foundations were involved in each game scenario/dialogue on a six-point Likert scale (0: Not At All; 5: Extremely). Sample statements included “Someone could have been physically harmed.”

**Results**

**Phase 1 Playtest Quantitative Results.** Descriptive statistics for phase 1 playtest are generated in Table 1. To examine players’ perceptions toward the moral content, paired-samples t-tests were conducted to examine if the intended moral foundation ratings were significantly higher than the second highest rated moral foundation for each scenario. For the fairness/reciprocity scenario, the mean fairness/reciprocity rating ($M = 3.15$, $SD = 1.57$) was significantly higher than the liberty/oppression rating ($M = 1.51$, $SD = 1.54$), $t(38) = 4.83$, $p < .001$. For the purity/sanctity scenario, the mean purity/sanctity rating ($M = 2.67$, $SD = 1.69$) was significantly higher than the liberty/oppression rating ($M = 1.62$, $SD = 1.80$), $t(38) = 2.58$, $p = .01$. The ratings for the intended moral foundations in the four other scenarios were not significantly higher than the other foundations ($p > .05$). Hence, the scenarios had to be revised.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Phase 1 M (SD)</th>
<th>Phase 2 M (SD)</th>
<th>$\alpha$</th>
<th>Phase 1 M (SD)</th>
<th>Phase 2 M (SD)</th>
<th>$\alpha$</th>
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</thead>
<tbody>
<tr>
<td>Narratives</td>
<td>4.07 (1.20)</td>
<td>4.26 (1.45)</td>
<td>.88</td>
<td>4.26 (1.45)</td>
<td>.90</td>
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<tr>
<td>Mastery</td>
<td>4.23 (1.10)</td>
<td>4.12 (1.49)</td>
<td>.65</td>
<td>4.12 (1.49)</td>
<td>.81</td>
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<td>Immersion</td>
<td>4.21 (1.29)</td>
<td>4.47 (1.61)</td>
<td>.79</td>
<td>4.47 (1.61)</td>
<td>.88</td>
<td></td>
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<tr>
<td>Hedonic</td>
<td>4.69 (1.14)</td>
<td>5.11 (1.46)</td>
<td>.77</td>
<td>5.11 (1.46)</td>
<td>.92</td>
<td></td>
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<tr>
<td>Curiosity</td>
<td>4.37 (1.09)</td>
<td>4.61 (1.43)</td>
<td>.55</td>
<td>4.61 (1.43)</td>
<td>.75</td>
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<tr>
<td>Challenge</td>
<td>4.89 (1.29)</td>
<td>5.13 (1.27)</td>
<td>.82</td>
<td>5.13 (1.27)</td>
<td>.83</td>
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<td>Ease of Control</td>
<td>4.12 (1.05)</td>
<td>4.05 (1.54)</td>
<td>.66</td>
<td>4.05 (1.54)</td>
<td>.82</td>
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<tr>
<td>Autonomy</td>
<td>4.01 (1.26)</td>
<td>4.54 (1.71)</td>
<td>.75</td>
<td>4.54 (1.71)</td>
<td>.88</td>
<td></td>
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<tr>
<td>Guilt</td>
<td>2.44 (1.14)</td>
<td>2.55 (1.21)</td>
<td>.88</td>
<td>2.55 (1.21)</td>
<td>.89</td>
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</table>

**Phase 1 Playtest Qualitative Results.** There was information overload in the workers’ profile. Players had to read stories and resumes of sixteen different workers each time, and the hiring process took up most of the gameplay time. Furthermore, players tended to hire workers based on the ethnicities of the applicants and how much they matched the type of stall that they chose to set up. In terms of game engagement, some players highlighted that they were unsure about what to do in the game between scenarios, which resulted in feelings of boredom during the process. Players were curious about the cost and profits of running the food court.

**Phase 2 Playtest Quantitative Results.** Descriptive statistics for the main variables are presented in Table 1. Almost all scores improved, compared to phase 1. For the care/harm scenario, the mean care/harm rating ($M = 3.26$, $SD = 1.69$) was significantly higher than the fairness/reciprocity rating ($M = 2.72$, $SD = 1.76$), $t(49) = 2.52$, $p = 0.02$. For the fairness/reciprocity scenario, the mean fairness/reciprocity rating ($M = 3.76$, $SD = 1.30$) was significantly higher than the purity/sanctity rating ($M = 1.82$, $SD = 1.70$), $t(49) = 7.48$, $p < .001$. For the purity/sanctity scenario, the mean purity/sanctity rating ($M = 3.32$, $SD = 1.83$) was significantly higher than the fairness/reciprocity rating ($M = 1.46$, $SD = 1.53$), $t(49) = 6.45$, $p < .001$. The ingroup/loyalty, authority/respect, and freedom/oppression scenarios still required revision ($p > .05$).

**Phase 2 Playtest Qualitative Results.** Some players highlighted that the act of cleaning tables provided them with something to do between the moral scenarios as the game progressed. Aside from that, players were curious to learn about the amount of money involved in their expenditure and how they could maximize their earnings. In terms of engagement with game scenarios, a few players commented that they struggled with the
moral choices and wanted to gain more information about those narratives before making their decisions. A number of players also expressed feelings of guilt toward the workers for certain choices they made, upon viewing the consequences of their decisions.

**Discussion and Design Recommendations**

Based on the results of phase 1 playtest and iterative evaluation, we made changes to the first prototype of the game, targeting three major considerations: the demands of the game for players, the level of engagement, and diversity of interactivity. The following section explains how we made changes to the game between the two playtests with balancing the fun and seriousness in mind and how players’ responses to the two versions of the game differ.

In the first prototype of our game, we have built in background stories for the game and workers, including dialogues that elicited emotional and moral responses, asked players to make a very wide range of choices, and various levels of mechanics for player interactivity. As Bowman (2018) pointed out, games that are engaging are typically very demanding. Lang’s (2000) limited capacity model argues that people have limited capacity to process information. Game players can only devote resources to some and ignore others. After the playtest, we realized that users focused on information about the workers and game mechanics but were not paying enough attention to the moral content in the dialogues. For instance, players did not recognize the authority/respect moral foundation embedded in the game dialogue. We revised dialogues in each scenario to make the six moral choices/foundations more apparent to players. Moreover, sixteen workers’ profiles were shown to players at the same time and each worker’s resume contained a life story, demographics and working experiences. To manage cognitive load, we reduced the number of worker profiles shown and took away life stories. The amount and variety visual display of the choices were modified based on the playtest results. We changed the range of choices given to players to avoid potential biases. Initially, each worker came with existing performance ratings, and that seemed to affect how players appraised workers later in the game. We also found that players often linked workers of a certain ethnicity with the corresponding ethnic food offered by stalls (e.g., Indian workers in an Indian food stall). Hence, we changed food options to be more generic without ethnic associations and removed the initial ratings of workers. This removed the potential automatic stereotypical associations so that players can decide based on their intuitions and values.

Studies have shown that high levels of game engagement are not necessarily effective for serious purposes such as learning outcomes (Cheng et al., 2016; Iten et al., 2016). If players are too engrossed in the game, the meaningfulness of the game might be cancelled out. We noticed that our players were immersed, challenged, curious, appreciated the game story, felt competent in playing the game, and were able to perform the various in-game actions with ease. Qualitative feedback showed players’ interests in understanding how the game economy worked (e.g., how much the stalls earn, how to make the most money possible).

We therefore have decided to incorporate only some of players’ feedback on increasing the entertainment aspect of the game play. The background stories and the visual indicators for game economy were reduced. The number of food stalls that players can set up increased. Players were prompted to select more stalls to open after earning a certain amount of money. In the second phase of the playtest, hedonic enjoyment scores improved.

Interactivity has been shown to be effective in promoting player engagement, involvement, and participation (Kennedy, 2004), and therefore boost learning motivations and enable learning processes (Scheiter & Gerjets, 2007). After the first playtest, we added features to enhance interactivity of the game. Players could click on each of the workers to view their profile information, such as their name, mood, nationality, and ethnicity. We also added an additional non-player character (NPC) friend that served as a companion to players from the start. This friend engaged players in chats after they made moral choices, encouraging players to reflect on the meaning of their decisions. Based on players’ comments about boredom in engaging in dialogues, mini games such as “cleaning tables” were added. This helped to improve gameplay engagement without affecting the overall goal of the games, as these were gameplay sequences that players could choose to skip.

Quantitative findings from the playtests showed that players had fun in both phases, with hedonic experience dimensions above the mean score. All scores improved after we modified the game based on players’ feedback, except for the slight decrease for mastery. A potential reason for the decrease might be due to the mini-game elements. The mini games required players to engage in different types of interactivity and tasks. The inconsistent way of interacting with the game might have led to uncertainty about mastering the game. Similarly, players had eudaimonic experiences in both phases, with the dimensions of meaning and autonomy attaining scores above the mean. The improved moral foundation ratings in Phase 2 suggested that the revised moral scenarios players were able to process and recognize each moral domain. Players only felt some level of guilt. Guilt is likely to occur if players make “immoral” choices and if they reflect upon the consequences of their choices. Players who made moral choices would not have felt guilty. All scores improved in the second phase of the playtest, except for meaning. This could be due to the reduction of the background stories of the workers and the game.

**Conclusion**

The proposed game design process allowed for both hedonic and eudaimonic aspects of a serious game to be designed in parallel. The playtest results suggest that the game has maintained an equilibrium between the fun and meaningful aspects of the game. We note three design considerations for serious games: 1) Take into account the demands of meaningful game aspects on players’ cognitive and emotional loads. 2) Understand the interplay between players’ engagement levels and their experience of meaningful outcomes. 3) Game interactivity should be designed with and mapped to both fun and meaningful outcomes.

**References**


