A New Design And Analysis Methodology Based On Player Experience

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Abstract

This study will provide an improved approach to game design and analysis by offering the gaming community with a framework based on user experience and founded by measuring and operationalizing, during game-play, the different intrapersonal game attributes in successful commercial games across five popular game genres.

Author Keywords

Game Design and Analysis; Player Experience; Intrapersonal Game Attributes; Challenge; Fantasy; Mystery; Goals; Control.

ACM Classification Keywords

Design; Human Factors; Measurement.

Introduction

After a close examination of the frameworks currently used for video game design and analysis, we found a significant need for a quantifiable metric. Frameworks like MDA [3], Educational Framework [1] and DPE [4] have provided us with a qualitative approach to game design, redesign and analysis. However, these frameworks provide no quantitative standard of

evaluation and leave much of the analysis to the designer's judgment.

Constructing a design and analysis framework based on a player's experience provides us with that elusive standard of evaluation. This study will attempt to establish this metric using a player's experience and feedback.

Game Attributes
To establish the appropriate parameters for this study, we first needed to determine a finite list of relevant game attributes that would affect the player's experience. Our previous study identified the following critical intrapersonal game attributes: *fantasy, challenge, goals, control, mystery, and auditory stimuli* [2]. We then mapped each attribute to a list of questions that quantify the feature and help establish the presence and impact of that attribute in a particular game.

Genres And Games
The genres we used for this study are*: First-Person Shooter, RPG, Racing, Sports,* and *Arcade.* From previous work, we concluded that these five genres are representative of a wide and varied spectrum of game playability, and perspective [2].

For these five genres, we selected ten games (2 per genre) to use in our study. First we selected all the games available in the Console Game lab at the College of Digital Media at DePaul University. Later we used an initial genre classification based on our definition of each genre. Then for each game we retained the genre classification and rating from four major game review websites (IGN.com, GameStop.com,

GameInformer.com and GameSpot.com). Next we play tested each of the games to determine the final factor, which is the suitability for our study.

We then rated each game with a "suitability factor," rated on a 1-10 scale. To incorporate this "suitability factor" with the other game ratings, we took an unweighted average with the other available ratings by the aforementioned review websites to establish an overall average. Finally, we selected the two games with the highest overall average per genre.

While attempting to validate our genre classifications, we asked each subject to classify (in their opinion) the genre to which the game they played belongs. After the study we have found that the players' classifications were identical to our classification in all 100 sessions. This absolute agreement between our and the players' classifications not only validates our classification but also ensures that our conception of these genres match the subjects' perception, especially when we ask them about previous experience playing games in this genre.

Subjects
For this study, we recruited 60 subjects, divided evenly between games. Out of that total, ten were expert game designers, each covering at least one game in a genre. The population from which we are choosing these subjects was both student game designers with previous experience and professional game designers.

Methodology
As discussed above, we recruited ten expert subjects and 50 regular subjects. For each of the regular subjects, we held an individual gaming session where the subject played a predetermined subset of one

game. These subsets were established to represent a continuous level, game or match during which a player can experience a full complement of the game features and has a clear beginning and end. The specific nature of the game subsets was determined during the play testing process. Ease of establishing a clear subset was a factor in whether a game was suitable for our study or not. An example of a subset would be an entire level in a First-Person Shooter game or an entire game of basketball or football in a Sports game.

For each gaming session, a subject played exactly one subset of that game. First we asked each subject a small list of pre-test, demographic questions. After each session we also asked the subjects a list of ten post-test questions about their experience. Each subset was also broken down into intervals during play testing. Those intervals are considered break points in the game where we paused the game in order to ask the subject a few questions about the nature of the game play experience.

Results

Given the sheer quantity of the sessions and questions (demographics, in-game and post session survey), the result dataset was very significant. The demographic data for our subjects is summarized in Table 1.

This study will discuss the metric for game attributes in optimal (commercially successful) games based on the

in-game questions. The answers for those questions (aggregated in Table 2) were used to determine the metric for our new methodology in game design and analysis.

For the challenge game element, we recorded the number of attempts a player took to finish a level (or number of possessions in a sports game or number of races in a racing game). The next four (directions, objectives, short-term and long-term goals) were provided by the player as the number of those elements available to them at any given time during the game. The next five (fantasy and sound elements) show the percentage of players who were able to accurately detect and describe those elements as part of their game-play. And finally, the mystery element was dictated by the percentage of players that were able to accurately describe their progress and what happens next in the game.

Immediately we noticed that most of these values correspond to the CCG Framework from our earlier study [2], with Fantasy, Sound and Mystery being the new additions. The consistency with the CCG Framework for Challenge, Control and Goals suggests validity for both frameworks given the two different methodologies for these studies. As for the three additional attributes, we contend those numbers should be further investigated and tested for consistency across those genres.

Sessions	100
Male	81
Female	19
Age	21.89
High School Graduates	70
Associate Degree	9
Bachelors Degree	19
Graduate Degree	2
Playing Experience (Years)	14.85
Playing Frequency (Times a Week)	4.95

Table 1. Demographic data for all sessions.

Game Element	Arcade	FPS	Racing	RPG	Sports	Average
Challenge (Attempts)	1.70	2.50	3.55	1.90	6.03	3.14
Directions	26.15	8.20	4.15	5.50	16.50	12.10
Objectives	3.85	4.33	2.65	2.25	4.80	3.58
Short-term Goals	7.85	4.63	3.10	2.63	4.40	4.52
Long-term Goals	2.10	1.60	2.15	1.75	2.18	1.96
Fantasy Characters	90%	85%	75%	80%	60%	78%
Fantasy Environment	60%	100%	85%	90%	85%	84%
Background Music	60%	50%	75%	55%	60%	60%
Environment Sounds	65%	95%	75%	90%	90%	83%
Feedback Sounds	100%	100%	95%	100%	100%	99%
Mystery	95%	80%	90%	50%	75%	78%

Table 2. This table represents the averages for the different responses received on those game attributes for each genre.

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