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Defining the All-Important Difficulty Curve



by Chris Pruett

Many video game designers believe that the first few minutes of a game are the most important. In the first moments of play, the player must be so enthralled that he will be willing to commit to the time required to complete the game, which can be anywhere from ten to fifty hours. The player's first impression of a game is likely to shape their opinion of the title as a whole, especially if that opinion is negative. If a game fails to hold the player's attention during its first few minutes of play, many gamers will put the game down and never come back to it.

Game design teams struggle with what exactly to show the player during that precious time. Some games opt for non-interactive videos that set up the game's story line or introduce the player to the main characters. Others provide a training area where the player can learn the mechanics of the game by following a tutorial. Some games, such as *Silent Hill 3* and *Eternal Darkness*, throw the player into an extremely short action sequence in order to give them a taste for game mechanics that, for plot progression reasons, will not appear again until later in the game. The way that a game begins will set the player's expectations for the rest of the experience, and an introduction that is too easy or too hard can cause gamers to quit before they even really begin to play; the seminal 3D driving game *Driver*, for example, required players to pass an exceedingly difficult test before they were able to play normally, which caused a lot of players to give up on the game almost immediately.

The problem game designers face is the definition of the *difficulty curve*, a term used to describe the progression of challenge from the beginning of a game to the end. While the introductory moments are of particular importance, much of the work in creating a successful game rests in the management of difficulty over the course of the entire game experience. If the play proves too difficult, the player will be frustrated and may end up with a bad impression of the game. On the other hand, if the game is

too easy then the player may become bored and quit before the game design has really had a chance to really show off its potential. As the player puts more time into the game, he will become increasingly adept at the challenge it offers, so the game must therefore increase in difficulty over time in order to stay interesting. The speed at which the difficulty increases should ideally define a curve, gradual at the beginning but increasing at a steady rate until the end of the game. But actually making a game conform to such a curve is quite hard because no two gamers play the same way. Striking a middle ground that is challenging and fun for a wide audience is an incredibly difficult task.

There are a lot of approaches to staging difficulty progression. The Role Playing Game genre (so named because its mechanics are based on pen and paper games like Advanced Dungeons and Dragons), for example, often allows the player to control the difficulty of the game themselves by managing statistics about their characters. Games like *Final Fantasy* will typically require that the player engage in combat to build up the strength of their characters, and will provide an endless supply of monsters for the player to defeat. This mechanic puts the pace of the game in the player's hands: if a particular section is too difficult, he can simply return to the previous section and battle more monsters to increase the strength of his characters. Combat in most RPGs is a function of random rolls of the dice rather than the dexterity of the player, so the difficulty curve of these games is consequently defined by how much time the player chooses to spend "grinding" his characters into powerful heroes. The down side to this method is that the player himself cannot improve at this kind of game; it is the statistics related to his character that improves, not the player himself. So there's no way for veteran players to short-cut the process and jump ahead; everybody is forced to spend some time developing their characters before they can continue with the game.

The *Crash Bandicoot* series, a resident of the Platformer genre, employs a system called *dynamic difficulty adjustment* in which the game changes subtlety to match the prowess of the player. If the player fails too many times in a specific section, the *Crash* games will temporarily increase the player's health or modify the section to decrease the level of challenge. Naughty Dog, the developer of the Crash series, stated that their goal with this system is for the user never to see the game over screen; in order to be enjoyed by the widest range of players possible, they have built in ways for the game to help the player complete difficult sections.

The Brawler genre takes the polar opposite approach in its design by embracing crushing difficulty as a core theme. Brawlers are games in which the player is pitted against wave after wave of enemy characters, each of which must be individually dispatched using a variety of flashy combat moves. Brawlers such as *Devil May Cry* and *Ninja Gaiden* focus on player dexterity and hand-eye coordination; though these games also allow limited capacity for the player to "power up" his character, most of the challenge rests in the player himself learning how to deftly control the game. These games revel in their difficulty, and aim to create a feeling of accomplishment in the player when he is finally able to overcome a significant challenge. *Devil May Cry* starts out hard (the first boss encounter is famous for its surprising difficulty) and gets increasingly difficult over time; it has a well-defined difficulty curve that happens to begin at a level of difficulty that many other games never reach.

One of the interesting things about difficulty curve design is that the mentality of the player has a significant impact on how quickly the difficulty may be allowed to rise. Players who enjoy RPGs like *Final Fantasy* and *Dragon Quest* are often drawn to the relaxed pace and lack of mechanical challenges offered by the genre. On he other hand, players who enjoy *Devil May Cry* and *Ninja Gaiden* often see the game as a test of their gaming prowess, a testament to their ability to see a task through to fruition despite significant challenge.

This mentality is evident in the way game developers label their various difficulty levels: rather than simply giving the player a choice between "easy," "medium," or "hard," some games go out of their way to play up the significance of the challenge that they provide. The popular first-

person shooting game *Halo*, for example, provides difficulty levels named "Hero" and "Legendary" in addition to the mores standard "Easy" and "Normal" modes. The naming of these modes suggests that a player must be better than average to meet the challenge that they provide. Viewtiful Joe, another brawler, ingeniously labels its two difficulty levels "Kids" and "Adults," thereby informing younger players which mode is correct for them while simultaneously challenging the ego of older gamers. Devil May Cry does not provide a difficulty setting upfront, but if the player dies too many times in the same spot the game will ask the player if he would like to switch to easy mode (a change that, once accepted, can never be reversed). This is a nice feature for casual gamers who are not interested in intense difficulty, but many Brawler afficient find the suggestion that they switch to an easier mode offensive to their pride. Indeed, even the dynamic difficulty adjustment employed by the Crash Bandicoot series is subtle and nonobvious; many players would react negatively if they knew that the game was making itself easier every time they failed.

Defining the way that players experience challenge, from the first few moments of play to the ending credits, is one of the core problems that game designers face. All of the games that are famous for their high quality, from Halo to Super Mario Bros., feature expertly designed difficulty curves. Though there are many strategies for ensuring that a game will increase in difficulty at a rate appropriate to a wide range of players, few games are able to maintain perfect difficulty balance from start to finish. Many otherwise well-designed games are marred by unintentional spikes in difficulty, which can lead to player frustration and ultimately to a negative impression of the game overall. However, careful game designers can manipulate the player into putting up with frustration by convincing him that completion of the game is a task worthy of a badge of honor, or by allowing the player to proceed at his own pace. A successful game designer must not only create challenge systems that can increase in difficulty, he must also understand the psychology of his audience. And even if a designer pours his heart and soul into the design of a game, many people will never experience the fruits of his labor if the first few minutes of play fail to grab them and

hold their interest. Perhaps this is why the truly terrific games are so few and far between; the formula for success is so difficult that only a small percentage of attempts can actually pull it off.