Teaching Mechanisms 2

We have established in the previous chapter that: "level design is applied game design." This tells us something about the function of level design, but it does not give us enough information on the core content that a level designer needs to provide. This leaves important questions unanswered. What are the intrinsic internal workings of level design, as opposed to its external goals? *What is it that we are trying to do in the context of the game?*

We already know how closely game design and level design are intertwined. If we examine both at the point where they overlap the most, we start to take a look at fundaments of gameplay. In order to define the *nature of level design,* we will have to define the *nature of gameplay,* and how it relates to level design.

The following three sections provide a detailed examination of these matters. They also provide a preview of the methodology used later in this book, where a given subject is examined through chapters covering the subject's basic *concept*, how it applies to level design *theory*, and what applications it has in *practice*.

Concept

The Nature of Gameplay

Anybody who has spent any time around animals, perhaps a pet dog or a cat, knows that they are very *playful* creatures. It is very easy to start playing a game with them on the basis of rules that are surprisingly easily understood.

- Catch the ball.
- Retrieve the stick.
- Let's pretend my hand is prey!
- Obstacle course!

It is clear when we watch the behavior of animals of a certain level of intelligence, that play comes *naturally* to them. This becomes even clearer when we watch them at play when they are young. When young animals at play are observed, it is clear that almost anything in their environment can be an excuse to initiate gameplay. To a puppy, for example, almost anything can be incorporated into gameplay, and that is true without anybody teaching the animal how to engage in this behavior. It is easy to observe that *gameplay comes naturally to animals* of sufficient intelligence, which hints at the possibility of play being fundamental to their well-being, due to evolutionary reasons. It may be linked to the animal's survival. This is as true for animals as it is for human beings.

Survival Skills and Make-Believe

Play is a relatively well-understood phenomenon. People from fields as diverse as behaviorism, anthropology, and biology have studied it, and a number of general findings can be agreed upon. First and foremost, it has to be understood that it is clear that there is very serious reason for this innate ability to be playful; it helps maximize the animal's chances of survival. Through play, valuable lessons are taught that clearly demonstrate this point. Through play, the young animal's skills are honed that are necessary in order to *hunt*, *fight*, *mate, hide,* or one of many other activities that are key to survival as an adult. Games provide a *safe context* in which these lessons can be learned through *play*. With this in mind, it is not controversial to state that *"Gameplay teaches skills that are important and necessary in order to survive in real life."*

This seems a straightforward-enough statement, but upon examination, a number of startling further conclusions can be reached. Not the least of which is the realization that animals are capable of grasping abstract concepts like *games* or *make-belie*ve It is irrefutable, however, because to engage in this kind of safe play, human beings (or animals that are capable of gameplay) need to be able to accept imposed boundaries and rules to their behavior. They need to understand that the gameplay experience is an artificial one. This means that fairly complex and abstract concepts are at play. We are, after all, talking about the understanding of something that is by definition an *abstract construct*, governed by a set of formalized rules.

Or to put it in other terms, when engaged in gameplay, we need to understand the difference between the rules that govern our *reality*, and those that govern the make-believe, or virtual, world of a *game*. This is quite an amazing skill, and the fact that we as human beings are adept at constructing and manipulating our experiences within these parameters is nothing less than remarkable.

Our propensity towards gameplay has far-reaching and interesting consequences. We see this ability to accept artificial, invented realities reach into areas beyond gameplay. For example, it is easily identifiable as crucial to the enjoyment of film, literature, art, music, and countless other forms of art and entertainment.

I will go into further detail with regard to this ability in Chapter 8, on immersion.

"Fun" as a Reward for Gameplay

It is safe to say that *good games are rewarding*. A good game is *fun*, or makes us *feel good.* But what is it exactly that creates this reward for us, and how does it work on a biological level? It needs no explanation that the answers to these questions are valuable to any level designer.

From studying gameplay in animals, we have learned that engaging in gameplay makes the animals feel good. They *want* to play games from a very young age on and need no prompting by external factors. In fact, they often do their best to initiate gameplay tendencies in others. Some of this behavior may originate from the fact that engaging in gameplay causes chemicals to be released in the bloodstream that act as a reward for playful behavior. This in turn makes animals *feel encouraged* to engage in this behavior. This is no accident, as the rewarding aspect of gameplay is *biologically necessary*. (This necessity stems from the need to learn survival skills within the safe context of a game, as we established previously.)

It only requires a small step to take this information and extrapolate to human behavior, which is basically the same. In fact, as already noted at the beginning of this chapter, our ability to understand games crosses the *species boundary,*[1] which is a strong indicator that comparable processes are at work. Much of human gameplay, when examined, bears striking similarities with gameplay in some advanced animals. *Hide and seek* or *tag* come to mind. We also are rewarded when we engage in gameplay, and in the case of humans, the chemical award is the release of certain pheromones, which make us feel good, or in other words, we experience "fun.[2]" Our large brains enable us to engage in games that are much more complex than those enjoyed by animals, but all the basic principles still apply.

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[1] If we take a moment to think about this, it should be apparent how truly extraordinary this is.

[2] See Raph Koster's book, *A Theory of Fun for Game Design* (Paraglyph Press, Scottsdale, AZ, 2004), for similar sentiments.

Aptitude for Gameplay

All around the world, people, adults as well as children, play games in which the rules are easy and even intuitively understood. This suggests that we as a species are very good at *"speaking the language of games."* We know, for example, that we can play games with people whose linguistics aren't ours, whose culture we don't share, and whom we have never met before. It is even clear that we can play games with creatures that don't even belong to *our species*! However we choose to look at the subject, it is clear that human beings possess a certain amount of aptitude for gameplay.

Universal gameplay grammar

One could even argue that human beings use something akin to a *universal gameplay grammar* that allows us to understand and play games easily, often without regard to their origins.

Although beyond the scope of this book, it would be fascinating to study this topic further, as has been done in the field of linguistics, where much study and discussion exist around the field of *generative grammar*, for example through the work of Noam Chomsky, not least because of his work in the field of *transformational grammar*. Here are some key concepts:

> [T]ransformational-generative grammar, [a] linguistic theory associated with Noam Chomsky, particularly with his *Syntactic Structures* (1957), and with Chomsky's teacher Zellig Harris. Generative grammar attempts to define rules that can generate the infinite number of grammatical (well-formed) sentences possible in a language. It starts not from a behaviorist analysis of minimal sounds but from a rationalist assumption that a deep structure underlies a language, and that a similar deep structure underlies all languages.[3]

Exciting as a "unified theory of gameplay" sounds, I think I will leave further examination of this for another book for now.

Support from Within the Field

Many notable people within our own industry have reached the same or similar conclusions. Raph Koster, the author of *A Theory of Fun for Game Design*, has the following things to say:

[3] "Transformational-Generative Grammar," *The Columbia Electronic Encyclopedia*, Sixth Edition, http://www.encyclopedia.com/topic/transformational-generative_grammar.aspx, 2001–2007.

> One of the subtlest releases of chemicals is at that moment of triumph when we learn something or master a task. This almost always causes us to break into a smile. After all, it is important to the survival of the species that we learn—therefore our bodies reward us for it with moments of pleasure. There are many ways we find fun in games, and I will talk about the others. But this is the most important.
>
> Fun from games arises out of mastery. It arises out of comprehension. It is the act of solving puzzles that makes games fun.
>
> In other words, with games, learning is the drug.[4]

Taking inspiration from *Flow Theory*,[5] which offers a scientific and well-researched approach to "happiness," Raph Koster describes processes that are very similar to our findings. Although he was talking specifically about *game design*, it is nonetheless as relevant to *level design* if one thinks of level design as *applied* game design. (See Chapter 1, "Game Design vs. Level Design.")

To find more support from the game industry community, let us also consider the following from Carolyn Handler Miller:

> The earliest games were developed not for idle amusement but for serious purposes: to prepare young men for the hunt and for warfare. By taking part in games, the youths would strengthen their bodies and develop athletic skills like running and throwing. By playing with teammates, they would also learn how to coordinate maneuvers and how to strategize. Over time, these athletic games evolved into formal competitions. Undoubtedly, the best known of the ancient sporting events are the Greek Olympic games.[6]

In these ancient games, we find another clear indication of gameplay as a teaching device for events in real life.

Many other examples illustrate that there is some support for the view that gameplay has a strong basis in teaching mechanisms.

Support from Other Fields

This notion that human beings possess a native ability to understand and engage in gameplay is not a new one. People in other disciplines who have been studying

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[4] Raph Koster, *A Theory of Fun for Game Design*, Paraglyph Press, Scottsdale, AZ, 2005, p. 40.

[5] Explained in Chapter 8 in the section "The Zone."

[6] Carolyn Handler Miller, *Digital Storytelling: A Creator's Guide to Interactive Entertainment*, Elsevier Science, Amsterdam, 2004, p. 27.

this concept and approached it from differing angles have come up with similar conclusions. Currently, a reasonable amount of data has been collected to support these findings, and more is uncovered on a regular basis.

> Researchers suggest that social play may safely teach young the skills they will later use in aggressive social competition. However, such play may also simultaneously strengthen social bonds between group members, a process that serves to limit the amount of actual aggression between group members.
>
> If social play can mirror real aggression in appearance, what then lets animals know that their partners are only playing? Animals, it turns out, communicate playful intentions with certain stereotyped signals. The most widespread play signal is the play face, a relaxed, open-mouth expression seen in many mammal species, used virtually from birth. The human smile almost certainly evolved from this ancestral trait. If someone smiles or laughs while hitting you in the arm, you realize that his or her intentions are very different than if he or she is frowning, with a tightly closed mouth.[7]

More and more studies and articles are appearing that explore gameplay for educational purposes. Consider the following example:

> Games[‘] greatest potential is that they’re worlds in a box. They allow you to create a world that somebody can be in and take on an identity. People learn most deeply when they take on a new identity that they really want. Let’s say I really want to know what it’s like to be a biologist of a certain sort. I really want to know what it’s like to feel that way, to value that way, to talk that way. I can do that now. I can be in that world. That’s going to be a deeper form of learning.[8]

A whole subgenre called *serious games* has appeared recently, which heavily relies on the educational aspects of gameplay and uses them specifically with the context of educational games.

Concept Summary

Our findings have taught us that from a very young age, human beings are *predisposed* towards playing games, just like many animals, *in order to learn impor-*

[7] Alex Hawes, “Jungle Gyms: The Evolution of Animal Play,” *National Zoo| FONZ*, http://nationalzoo.si.edu/Publications/ZooGoer/1996/1/junglegyms.cfm, 1996.

[8] Joel Foreman, James Paul Gee, J. C. Herz, Randy Hinrichs, Marc Prensky, and Ben Sawyer, “Game-Based Learning: How to Delight and Instruct in the 21st Century,” *EDUCAUSE Review* 39:5 (September/October 2004), pp. 50–66.

tant survival skills, in a *safe* environment. It may even be *hardwired in our brains,* and we are *rewarded* with pleasure if we engage in playful behavior. We call this pleasurable feeling *fun*. Related to this predisposition towards gameplay is our ability to easily and readily *suspend our disbelief,* when confronted with *virtual experiences*.

Games can be considered a *teaching mechanism*. One of their most important purposes is to teach vital life lessons through gameplay. This concept of educational gameplay, from a biological point of view, is far-reaching and fundamental to us as human beings. It is literally a part of our *behavioral makeup* for reasons of survival, and understanding the processes at work is vital to our understanding of level design. Many of the same underlying mechanics at work with regard to play and traditional games apply to level design. Gameplay and educational processes can form a natural match, examples of which can be found in new gameplay-based educational programs, serious games, and scientific literature.

Nonetheless, it is important to keep in mind that evolutionary play is a very controversial subject, and to this day, arguments in favor and against are still debated.

> Explanations of play that involve either proximate or ultimate cause, or both, are common in the literature. However, though evolutionary explanations—and hence ultimate explanations—of play pepper the literature, their success in answering the question, "What is play for?" has been limited.[9]

Nonetheless, play as a teaching mechanism provides a worthy area of knowledge for level designers to dip into. There is much useful data there to link to level design theory.

Theory

If we are predisposed to gameplay because it *teaches* us survival skills, it stands to reason that we examine the teaching aspects of this concept further. The idea that games can be seen as a *teaching mechanism,* born out of biological or evolutionary necessity, is certainly interesting. Based upon our finding so far, we can formulate the following statement:

[9] Garry Chick, "What is Play For? Sexual Selection and the Evolution of Play," keynote address presented at the annual meeting of The Association for the Study of Play, St. Petersburg, FL, February 20, 1998.

> In purely biological terms, a game is an artificial construct, designed to safely teach survival skills, and in doing so, rewarding the player with pleasure.

This statement seems fair and accurate, but how does it help us understand or apply level design? Let's see if there is conceptual overlap between this general *concept* and specific level design *theory* by rephrasing the previous statement so it fits within the parameters of video games. A translation into video game terms would look like this:

> A video game is an artificial construct that, when well made, rewards the player with fun.

If we equate the concept of *teaching survival skills* from the first statement with *well made* from the second statement, we find that they equate very well.

There is a strong correlation between the rewards we receive from play in general, and those we receive from playing video games. This is not strange, since video games are just a different form of games, and therefore are subject to many of the same underlying principles. However, we are not used to looking at video games in that way, even though it makes sense to do so.

Much traditional play is all about *teaching skills*, and *testing* the player's proficiency. It is rewarding to master a task, or to be good at something. Games teach motor skills, mental skills, skills of reasoning, and so on. Gameplay allows us to put those skills to the test in a controlled manner. A good game strikes a balance between teaching these skills and providing the player with an enjoyable testbed in which to try them out. There is no reason to think that video games are any different, and in extension, the same is true for level design.

"Good" Level Design

As we have already established in Chapter 1, "Game Design vs. Level Design," we can state that level design is the *application* of game design. We now also know that in practical terms, we can say that *"good level design teaches the player how to play and enjoy the game."*

This is one of the most important concepts in level design, and when better understood, one that good level designers will keep coming back to, time after time. It can be used in almost any aspect of level design and can relate the smallest gameplay mechanic to the largest span of levels.

Let's look at a small number of areas where this can be applied:

- the physical rules of the environment,
- the abilities of the player's in-game character,

- the behavior of enemies,
- the game's reward systems.

These are all major gameplay areas, and the game as whole would suffer if their rules were not properly taught to the player. Conversely, if the player is taught well how to deal with these areas of gameplay, this will form a solid basis for a good gameplay experience. This is part of the reason why the *game* cannot be good if the *level design* is not good. The underlying game design can be the best in the world, but if the level design does not support it by teaching the player the rules of this brilliant game, it is all for nothing. Furthermore, if the game design does not support education though level design, it will never be fully enjoyed by the player.

If we accept that this *teaching role* is absolutely fundamental to level design, it makes sense to try to define the best techniques available to us in achieving this teaching goal. This is what I mean by *teaching mechanisms.*

Good level design is not just teaching the player the rules of the game, but also allowing the player to use those rules in a way that is rewarding and fun. Much of the fun comes to the surface when the player is tested.

Teaching Mechanisms vs. Testing Mechanisms

Teaching mechanisms are meaningless unless that which is taught is tested and put into practice. There has to be a way to test the player's knowledge or proficiency within the game, or the game may lack purpose. This is another intrinsic goal of level design. If the gameplay is taught well and the player gets tested in an enjoyable manner, the level designer has done a good job. Countless lessons and techniques can be derived from this fact alone. Examples of this balance can be found in many successful video games, and throughout the book many of these will be referenced or new ones will be explored.

Testing[10] the player's skills and knowledge is an integral part of the teaching mechanisms in level design. From now on, when I refer to *teaching mechanisms*, it can be assumed that I am also talking about *testing mechanisms*.

Teaching Gameplay and Reward Systems

At the basis of much level design success lies the ability to show the player how the game's play mechanics tie in with the game's reward mechanisms. What actions and skills does the player have to master in order to get rewarded by the

[10] It is important to note that testing does not necessarily equal challenging. A test can constitute a challenge, but not every test has to be a challenge.

game? Where are the most enjoyable sections to be found, which weapons provide the best results, what creatures are most fun to play with, and which skills should the player train first? All these questions present a teaching dialogue between level designer and player.

Inappropriate Gameplay

When we teach the player how to play the game at its most effective or its most enjoyable, it is expected that those lessons are meaningful. Players implicitly trust the game to teach them techniques that are consistent and trustworthy throughout the game.

It is therefore important for us as level designers not to betray that trust, and to create gameplay scenarios or puzzles not only for their own sake,[11] but also in context of the gameplay appropriate to the game as a whole. To put it simply, if possible, we should not create situations where the player's skills are useless.

For example, we should avoid situations that arbitrarily or in an unannounced way deviate from the needed skill set and require something from the players that they have never been taught.

This lesson is easily (and often) forgotten. A typical example is found in *boss fights*[12] that don't use taught gameplay skills—and they are rife in game levels. Please be aware of pitfalls in this regard.

Teaching Mechanisms in General Areas of Level Design

It is impossible to try to identify all gameplay mechanics and try to find ways to teach them best to the player. Not only is this impossible due to the scope of the task; it also wouldn't cover new genres of gameplay or unexpected gameplay occurrences. Furthermore, mechanics differ wildly between genres.

A more sensible approach lies in trying to find common themes that can be applied to diverse situations. I have identified a number of areas that cover most aspects of level design and deserve a further look:

- the game's main goals and rules,
- the abilities and limitations of the game's player character,

[11] Although there is place for discreet isolated puzzles, or even games dependent on them.

[12] Boss fights are climactic fights between a player and an extra-powerful computer controlled opponent.

- the physics and scope of the gameplay world,
- the abilities and limitations of the non-player characters,
- success strategies available to the player.

Each of these areas covers a very wide range of gameplay issues and is worth exploring further.

The Abilities and Limitations of the Game's Player Character

A player's *in-game character* or *avatar* provides the player with much of his or her interface with the game world. To a large degree, players experiences and interacts with the world through their player character. This is of course less important to games where the main gameplay does not derive from interacting through an avatar, but the principle still stands that players need to know how they can manipulate or interact with the virtual world they are exposed to. For example, it is just as important in *Tetris* to know how to rotate, direct, or drop down shapes as it is in *Tomb Raider* to know what jump distances are viable or what surfaces can be climbed.

This need to know defines the player's abilities and limitations in context of the game's (virtual) reality. It is very important to teach this early on in the gameplay experience, because the earlier this is accepted by players, the earlier they are able to suspend their disbelief in what is after all an artificial construct.

This need is actually fairly typical in all kinds of games. In chess, for example, half of the rules are linked to knowing what the abilities and limitations of the individual chess pieces are. There is in fact no point in playing the game until you know. (This does not mean that in video games these rules can't change later on, but in most cases, these changes have to come after the player has been taught the fundamental and basic rules.)

The Physics and Scope of the Gameplay World

Just as it is important to define the abilities of the player character, it is important to teach players how they interact with the game's environment. This is important because it gives further *context* in which to perform actions. In some ways, the game world can be seen as a character in itself.

Players' actions by themselves don't have much meaning unless they are performed within a defined physical context. The game world is a large part of this.

The Abilities and Limitations of the Non-Player Characters

If a level designer works on a game that features non-player characters, which is extremely likely, the player needs to be taught how to interact with them. This does not only cover *enemy AI* (artificial intelligence) but any AI characters present in the game.

The Game's Main Goals and Rules

In most cases (there are exceptions) it is wise to assume that players need to learn what constitutes the core gameplay experience of the game they are playing. In other words, they need to know early on what the game's main objectives are and how to achieve them. This is true on a level-by-level basis as much as it is true for the game as a whole.

Success Strategies

From a player's point of view, a video game needs to be worth playing. The actions a player takes while in the game need to include gameplay that is somehow rewarding to the player, especially if linked to progression within the game. There are strategies available to the player that result in an enjoyable progression. Part of the fun of a video game is finding out what they are and perfecting them.

From the player's point of view, this is central to being taught how to enjoy the game. To players, a game is an entertainment device over which they have control. Learning how to manipulate this device in order to yield maximum fun is imperative to good level design. To learn this, a player has to determine which strategies of play yield the best results. A *success strategy* in that context is defined as a strategy that produces a fun gameplay experience.

These success strategies can be *formal* in nature, requiring predescribed solutions to gameplay questions. For example, this occurs when a player has to progress through a level by following a specific path, determined by the level designer.

Alternatively, success strategies can be informal, defined by the players themselves. Good examples of this can be found in games where players can devise their own enjoyable gameplay through nonprescribed interaction with the game's environment. Although less explicit than formal strategies, this kind of freeform play can still be encouraged through good level design.

Some Dos and Don'ts

Without trying to be exhaustive,[13] I would like to highlight some typical dos and don'ts related to this subject. They are not hard rules; use your own judgment, but they generally should be considered.

Dos

Let's start with some recommended approaches.

Teach by practical example

Always give players a chance to put the things they have been taught into practice as soon as possible. When a new gameplay mechanic is introduced to the player, it is best to let the player try it out immediately. The best way of learning for many people is by doing. And it is easier to put lessons into practice when they are still fresh in the mind of the player.

This is a good habit to get into, and once you are aware of this method, you will start to notice the principle in many other games. For example, many Nintendo games do this consistently.[14]

Positive reinforcement

If at all possible, make sure players are actively rewarded when they pass a skill-test or successfully progress through a challenging gameplay scenario.

When players are taught that there are very positive consequences for successfully navigating the game, they will become eager to engage with it.

Prepare the player fairly

Make sure that players have the right tools and knowledge available to them before they are forced to perform a skill test that they can badly fail. There is a place for lethal encounters in many games, but it is always necessary to make them *fair*. Unannounced or unavoidable instant-death traps are generally to be avoided, unless they are expected in the game's genre.[15]

When possible, teach important skills in a safe environment first. A great example of this philosophy is found in the *Half Life 2* series:

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[13] Elements of this chapter will keep appearing in some form or another through the book, and additional tips and danger areas will be highlighted per subject.

[14] *Zelda: Twilight Princess*, to name one.

[15] This will be covered in more detail later in the book, specifically in the chapters on reward mechanisms and challenge.

> Players discover that every basic skill is taught in a very unobtrusive way, especially early in the game. This includes simple challenges, like stacking the crates to get out of the windows in the Trainstation, to more complex ones, such as the Antlion Pheropod "Bugbait" training in the Coast section. The difficulty of subsequent tasks could then be increased knowing that the player had been taught the mechanics they needed to succeed.[16]

Make sure that players can comfortably learn the skills they are supposed to pick up. There is no problem with ramping up difficulty later on and providing more difficult encounters, but when first teaching the player how to play the game, the lessons should be forgiving.

Players should be introduced to new mechanics in non-frustrating ways. This can mean that a skill can be taught in such a way that players cannot fail the exercise and only need to focus on practicing the skill until they can perform the tasks relevant to the teaching exercise.

Don'ts

We also need to be careful to avoid some problems. The following examples are situations to look out for:

Don't start with failure

Sometimes level designers are tempted to start a new level with a very serious challenge. They want to begin gameplay on a tense note and immediately put the player in grave peril. This may sound good on paper, but a game is not a book or a script. If there is serious danger, there is a serious chance that the player will fail the gameplay challenge. Imagine how frustrating it is for those players who don't pass this test and end up failing badly right at the beginning of a level. Rather than being enjoyably tense, the experience is likely to be off-putting and tell the player that the game will be a frustrating affair. In fact, it discourages the layer from playing, and that is something we generally want to avoid.

Don't taunt the player

It is strange that I even feel the need to write this, but this advice is too often ignored. It is crucial that even when players are struggling to pick up a skill, that they be encouraged in a positive manner, and not scolded for not being able yet to master a mechanic or meet a gameplay challenge.

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[16] David Hodgson, *Half Life 2: Raising the Bar*, Valve/Prima Games, Roseville, CA, 2004, p. 277.

When a gameplay section is supposed to be about teaching, play mechanics make sure the results are positive, even if the player takes a long time to master the skill. Don't shut off award paths or use taunting language or employ any similar tactics, as you will just put off those players who for some reason or another struggle a bit more than others. You will end up punishing those payers who have the most to gain from an encouraging approach. If that happens, you may well lose them completely if they get fed up with the game and put it down for good.

Theory Summary

There is a direct and useful link between level design and the educational aspects of gameplay. Level design can be seen as a vehicle to teach the player among other things, *how to play and enjoy the game*. Gameplay, and by extension level design, functions as a teaching mechanism. The techniques and strategies that can be derived from this conclusion cover almost every aspect of gameplay.

There are too many ways to employ this knowledge to focus on individually. This chapter has identified a number of important ones, and future chapters will explore even more.

Practice

Example 2.1: Teaching by Doing—Mandatory Skill Gates

Summary

Generally the most enjoyable way of learning a skill is by "doing": the player actually trying to perform the necessary actions, and adjusting and adapting until he is able to put the lesson into practice. Because levels often make heavy use of *interactivity* and *player agency*[17] to a large degree, this method is very suited to the form.

There are times when a level designer needs to be sure that the player possesses certain skills or is in possession of specific knowledge. A guaranteed way

[17] The ability to act in the world.

of teaching the player something like this is by making absorbance of the lesson a condition for progress.

The two aspects can be combined in a discreet level design scenario that is very useful in many circumstances.

Game Genre

The technique is suitable for any game where progress can be halted if a game mechanic is not yet mastered (either naturally, or by scripted means).

Goals to Achieve

- Showcase a natural way for the player to pick up skills through gameplay actions in level design scenarios.
- Make sure the player cannot progress unless they have been taught how to use the new skill.
- Teach new skills in a controlled setting.

Description

(Example type: Original/general)

If a level designer wants to make sure that players pick up a certain level of proficiency when introduced to a new gameplay mechanic, he or she can consider the use of a *skill gate* in a locked-off gameplay arena.

Such a setup is realized by establishing a dead-end area where the player finds or is introduced to a new gameplay mechanic. This can be a new skill or perhaps a new item that is to be used throughout the game from then on. Imagine a player needing to jump down one-way drops (too high to jump back up) all the way to the bottom of a ravine. Once at the bottom, the player is trapped there unless they can find a way to backtrack along the path they just used. If the player is then confronted with a new skill—for example, an increased athletic ability—he can now practice that skill by using the new athletic ability to travel back along his original route. This will only be possible if the player becomes proficient enough with the new athletic capabilities to be able to scale the heights that were prohibitive before.

The designer can include extra difficult areas off the main path, filled with rare collectables, to encourage the player to exercise and practice the new skills even further. By the time the player has left the ravine, she will have learned the new skill—or would not have been able to escape—and have been given the opportunity to find extra rewards through extra efforts, showcasing that the new skill is enjoyable and useful.

Further Notes

This technique is extensively used in Nintendo's "Zelda" games. Upon the introduction of a new skill, the player is typically confronted with a use for that skill close by.

There are many more ways that these skill gates can be part of a teaching mechanism. A puzzle may need to be solved before the player receives an item that unlocks the next area of the game. A creature needs to be defeated by using a specific gameplay mechanic to its full potential. A locked dungeon may have to be cleared of enemy creatures before it unlocks. Game history is full of further examples that can be adopted for new level designs.

A further advantage lies in the fact that, since the player is guaranteed to have learned the skill at the end of the gameplay scenario, the level design can now take this into account.

Example 2.2: Teaching by Example

Summary

By showing players certain actions or outcomes in the game world, you give them the opportunity to learn by observation and example. This principle is easily translated in custom-made gameplay lessons that are effective and appropriate to the level setting.

Game Genre

The technique is suitable for all games that allow the level designer to create an observable sequence of gameplay-related actions.

Goals to Achieve

- Introduce a new enemy into the level, at a safe distance from the player.
- Show conditions in which it becomes a threat.
- Demonstrate the severity and nature of the threat.
- Show to the player what tactics work against the enemy.
- Give the player a chance to practice this in a safe setting.

Description

(Example type: Original)

A classic scenario in level design is found in the introduction of a new enemy in the game. If this encounter is of sufficient importance and the level designer has

time to turn the encounter into a mini set piece, it can be turned into a scripted teaching mechanism. By showing how the creature reacts or how the creature can be defeated through the actions of others, the player can learn and strategize without being directly exposed to any immediate danger.

The trick is to find a natural way for the player to be separated physically from the action but still be able to observe a scenario played out in his presence. This can be done simply by providing a distance barrier (the player can't get close enough to the action before it runs its course) or a physical barrier that still allows the player to see the action unfold. The example may play out on a balcony the player can't reach, or some similar restraint.

Let's take, for example, an adventure game where the player is part of an archaeological dig on the side of a mountain. The other members of the party are human, as is the player character. When the player reaches a certain position near some loose rocks an event is triggered. One of the party members slips on the rocks and falls down onto a precarious ledge, which houses a big bird's nest. The nest belongs to a condor pair, and the mother can be heard squawking from far away. The sound becomes louder, however, until the irate bird flies into view and starts attacking the fallen archaeologist. It does so by either flying over the NPCs head, trying to scratch him with its claws or by flapping its wings in front of him trying to push him off the edge. The NPC takes initial damage, but eventually notices that crawling protects him from the flyover attacks, while throwing rocks at the bird interrupts the flapping attack. Other NPCs get the clue and also start throwing rocks at the bird, but are not able to hit it. The player, on the other hand, is given the opportunity to do the same, and when he or she successfully strikes the bird with a rock the bird is scared off. The NPC is subsequently rescued by his colleagues.

The player has learned a number of things:

- the existence of these condors in the level;
- the fact that they become aggressive if their nest is disturbed;
- aspects of their behavior: time to arrive on the scene, different attack modes;
- the amount of damage they can do;
- several strategies for coping with them;
- how to dispatch them.

All in all, that is a decent amount of gain from one custom-made lesson. From now on, the level designer should be able to use the condor threat in several circumstances. The player may be confronted with a path that is blocked by a nest, or the player may be accosted by a pair of condors to up the challenge. Many other scenarios can be imagined, but the player will at least be familiar with key aspects of the creature.

Further Notes

It is vital when employing this technique that the player is subject to the same rules as those entities around them. To give a simple example, it would be unfair to show a non-player character who is physically the same as the player character to be more resistant to environmental damage than the player. So, for example, if an NPC of the same abilities jumps off a high roof and survives, the same outcome should apply to the player (unless there is a good explanation for a different outcome).

Example 2.3: Formal Tuition—Overt and Covert

Summary

Sometimes it is valid to teach a player something through a tutorial or training sequence. The player is aware that he or she is being taught something about the game and needs to pay close attention because of this. This example shows a way to do this that does not break the game's immersion.

Game Genre

This technique is especially suitable to games that require the player's suspension of disbelief to stay intact.

Goals to Achieve

- Teach the player game related skills.
- Do this in a formal manner; the player knows they are being taught something.
- Show overt and covert ways of doing this.

Description

(Example type: Existing game)

Many games require at one point or another that the player go through a tutorial in order to learn a new ability. This can, however, be done both in *overt* and *covert* ways. *Overt* in this context means that the tuition is not hidden within the game world. The player is literally told that they are being taught without pretending it is part of the game proper. This is what happens with tutorial sequences outside the levels of the game, a bit like an interactive manual.

Covert, on the other hand, means that the teaching occurs within the story or within the reality and logic of the game world. The game stays "in character" and does not break the fourth wall. This is a very useful technique as it has a number of valuable side effects beyond the content of the tutorial. This kind of teaching mechanism can achieve the following goals:

- teach the player a skill (or range of skills),
- maintain immersion,
- maintain suspension of disbelief,
- add to the level content.

Halo—Covert camera calibration tutorial. In Bungie's *Halo: Combat Evolved*,[18] we can see this technique utilized with great intelligence. The game is played with a first person camera; preferences with regard to camera calibration is one of the peculiarities of players: If you press the camera stick on the joypad up, should the in-game camera look up or down? As it turns out, Microsoft has studied this subject through extensive usability testing, and they found that there is a 50-50 split of preferences on this subject. This meant that whatever the default setting for the game camera was, it was going to be wrong and frustrating to half the players. They decided, therefore, to let the player calibrate the camera themselves in-game, in a covert camera calibration tutorial. This was a very clever and useful solution to a problem that should not be underestimated.

The resulting level design solution was to place the player character in a setting where the game could measure the player's input when asked to perform a task. In this case, the player is given a new combat suit and asked to "test" it for optimal performance. The player is literally asked to look left and right, up and down, and the resulting player choices tells the game what the player's preference is in this regard.

This solution shows that it is possible to maintain suspension of disbelief even when teaching or calibrating very technical aspects of gameplay.

Further Notes

Other classic covert tutorial or teaching scenarios occur in games that use an obstacle course for in-game training of operatives. This occurs, for example, in the first *Splinter Cell*[19] game, where the player is asked to finish an obstacle course to assess if the player has received enough training.

[18] Published by Microsoft Game Studios, developed by Bungie Studios, released November 15, 2001.

[19] Published by Ubi Soft Entertainment Software, developed by Ubi Soft Divertissements Inc., released November 2002.

Example 2.4: Teaching through Experiment

Summary

A very pure and natural way to discover abilities and other things is by *experimenting* with things. Playful experimentation is a cornerstone of education, not only for children but for adults as well. ("What does *this* button do?")

This method can be used to much effect as it tends to produce very enjoyable results.

Game Genre

The technique is very suitable for sandbox games. Additionally, it is a very useful technique when there are multiple uses for a game object.

Goals to Achieve

- Create a situation that allows for self-taught gameplay skills.
- Create an environment that encourages experimentation.

Description

(Example type: Original)

There is a funny cliché associated with 2D point-and-click adventures that you often need to combine the use of completely disparate objects in your inventory to find a solution to some obscure problem—the (valid) complaint being that there is no logical sense to many of these item combinations. Those games do highlight, however, that it is fun and rewarding to find uses for things through experimentation.

This principle can be expanded on in level design by making sure that there are instances where the player can freely experiment within the interactive parameters of a level to learn new skills, or find new uses for objects.

To try to encourage this kind of experimental yet educational gameplay, you may find it worthwhile to create specific areas where the player can indulge—a "safe zone" with no loss of, say, expendable items.

A good way of doing this is by creating a situation where there are multiple uses and outcomes built into the level design scenario from the outset. To do that, we take a number of desired outcomes and characteristics and use them as the building blocks for our level design scenario. Taking, say, the humble game crate[20] as a starting point for an example, we can list a number of ways in which this can work. We can say, for example, that the crates can

[20] Discussed in Chapter 8.

- block NPCs,
- be stood on,
- be climbed,
- be stacked on top of each other,
- be pushed over,
- be moved about.

If we take these basic abilities of the crate, add a player character's abilities to the mix, and combine those two with an environment containing aggressive NCPS, collectibles that are out of reach and additional crates that the player can't get to, we end up with a recipe for great potential experimental fun.

The player could try to do things like

- create a stack of crates that can be climbed to reach high areas (to get to collectibles),
- create a stack of crates to reach other crates to add to the mix,
- prepare traps where the crates can be shoved off ledges onto enemies,
- create towers of crates to be pushed over on top of enemies,
- create pens in which enemies can be trapped,
- create structures that are pleasing to the eye,
- stand on crates in order to review the environment form a high vantage point.

Many other uses can be found depending on the level in question.

Look at all the things the player has the potential to learn—many ways to find new objects, interact with enemies, manipulate the environment—and all without any explicit tutorials. Anything the player learns will feel like something they have earned through intelligent gameplay and as such is very rewarding to the player.

Further Notes

There exists the danger that this technique does not aid the player in finding the right solution. It is therefore best implemented in situations where the teaching mechanic is optional—i.e., one very specific solution is not required to complete the challenge.