

Porting Learning Objectives into Gameplay Mechanics

A Three-Pronged Approach Matt Haselton and Dan Norton

At Filament Games, we've developed a strategy for mapping educational content into gameplay mechanics, effectively using the design process to align how people have fun when playing games with the way they learn. Based in the theory of Jim Gee, our design process codes learning objectives into one of three categories, and uses the unique attributes of that category to develop a tangible game component based around that objective.

These groups--identity, verbs, and systems--are designed to encompass the range of ways that players can interact with games, and provide traction between learning objectives and gameplay in a way that creates universal and significant player impact. The features of these categories are as follows:

Identity

In some cases, learning objectives are best attached to an embedded identity or character that can be used to empower the player. Identity-based objectives are one of the best ways to provide context for additional, more complex ideas by creating a situation where the player feels like the choices they are making are significant. Oftentimes, these identities can be considered a discrete way to direct the player by limiting their agency: a player assuming the identity of an Old West cowboy may be unable to crochet socks or lecture to schoolchildren, but because those actions fall outside of their assumed identity, the play experience does not feel constrained. These identities can be (but are not necessarily) fantastical or exaggerated depending on what best serves the learning objectives and the enjoyment of the game.

For example, in the game *Do I Have a Right?*, the player takes on the role of a successful law- firm partner, providing the narrative impetus for their in-game actions of matching constitutional rights with legal scenarios. In this case, the player's assumed identity serves as a common thread that not only provides a clear, inherent set of goals to the player (be a successful lawyer!), but also creates player impact by linking all in-game actions together into a unified play cycle (everything the player does, from purchasing a new water cooler to taking on new clients, is justifiable in the context of "law office owner").

Not every game has to use identity as a strategy, *You Make Me Sick* does not provide the player with a cohesive identity to enact, instead allowing players to interact with a variety of scenarios by assuming a non-personified omnipotent "virus controller" role, still facilitating gameplay mechanics, but with less embedded background.

Verbs

Identities in games are tightly connected with *verbs*: the actions that a player can take that define their game-play capabilities. As with the creation of game identities, determining the range and type of verbs within a learning game must be centrally informed by the key learning objectives and an understanding of what actions are fun and motivating to the target audience. Ideally, these actions provide a way for the player to directly interact with the learning objectives in a way that still feels playful.

For example, in the game *Mastermines*, a game about identifying minerals, the player's verbs

not only include traveling the world and excavating mines, but a wide battery of tests that the player can run on the recovered minerals in order to determine its identity. These actions are not only varied, and derived from the learning objectives, but directly linked to the game's win conditions of collecting a complete set of minerals, effectively demonstrating how content can be translated into gameplay.

Like Identity, a game doesn't have to exclusively use this strategy, and not every verb needs to be a direct, literal re-enactment of a learning objective. For example, the player's actions in *Activate*, a game about civic engagement, are largely conceptual reinterpretations of the learning objectives--"contact your elected officials" is translated into a minigame that has the player attempting to catch the City Councilmember on a maze-like map--creating an experience that relies more on developing a player's understanding of the overall system than the individual actions.

Systems

Systems in games are the rules that control the interactions of all the components in a game. In the game Monopoly, systems are what help the player decide if they should buy, sell, or develop a given property on the board. Systems aren't only composed of rules for the player, but also the rules that structure the game world itself.

Where identities provide a way to ground some of the more nebulous learning objectives in meaningful play, and verbs offer a sort of 1:1 translation of straight-forward learning objectives into game mechanics, systems are best suited for capturing complex ideas that are comprised of multiple intricate components. Systems in educational games provide a way for the player to anticipate and predict the outcome of their actions, and the influence they will have on the game world. In the game *EcoDefenders*, players are tasked with creating an invasive species to eradicate a rival lifeform. While the player has a host of actions available to them, without an understanding of the larger system supporting and responding to those actions, they will be unable to succeed at the game.

Conversely *Prisoner of Echo*, a game about wave theory, is a more modular game that carefully leads the player through a variety of complex scenarios exploring modular aspects of the subject matter. While *Prisoner of Echo* has systems that define the player's capabilities and the manipulation of sound, it also uses a firm narrative structure to guide the player in a direct way through the game experience, as opposed to a dynamic, choice-driven play experience. Due to the disparate nature of the individual learning objectives, creating a unified system for the game would have detracted from the player experience by making the gameplay artificially repetitive, as well as limiting the amount of new academic content that could be introduced over the course of play.

Summary

When creating a game—or any piece of media—one must remember that audience impact, not the product itself, is the real objective. Media is a transient middle between a source and a receiver, existing to make some sort of discernible impression on the audience, and in the case of educational games, this impression must be a lasting one with a benefit beyond enjoyment. When evaluating whether or not an educational game “works,” we often judge it by two separate metrics: whether it is enjoyable as a game, and whether it succeeds as a teaching tool. Hopefully strategies like those outlined above can help clarify the complicated process of making educational games that “work”.

Dan Norton: Dan Norton is Creative Director and founding partner at Filament Games LLC.

Matt Haselton: Matt Haselton is a game designer at Filament Games, LLC.