

That's Entrainment!

Craig Ullman

There's a handy little neologism making the rounds these days, and I think it's key to understanding instructional design for interactive media: *entrainment*.

Based on the Old French *entrainer*, which meant "to drag," *entrain* has been used for some time in English as a rather obscure verb meaning "to pull or draw along after itself." The meaning of the word was extended into chemistry: "to carry along in a current."

It's one of the pesky complications of civilization that words morph (like *morph*, for instance); they change meanings, they drop

meanings, and sometimes they end up meaning completely the opposite of what they originally meant. This previously obscure word has taken on an exciting new obscure meaning: entrainment, for interactive media, has come to mean "the internal rhythm of an experience."

Perhaps the purest example of entrainment I've seen is the old video game, Pac-man. As you might recall, Pac-man was a two-dimensional maze. A yellow circle the user controlled had to go through the entire maze, appearing to eat all the dots that line the maze. The ravenous little circle was chased by brightly colored gumdrops called ghosts. If the gumdrop reached the yellow circle, the circle withered and died to a sad sound effect. However, there were four large dots near each corner of the maze called power pills. If the yellow circle ran over a power pill, the ghosts would turn blue, and the yellow circle could then chase and eat them. The object of the game was to survive long enough to clear the maze and go to the next identical one.

The anthropomorphism was vague at best; while brightly colored, there was no suggestion of depth, and no real purpose. Pac-man was an inordinately trivial game. And yet, a legion of fans played the game to the point of tendonitis (they called it "Pac-man

elbow," and no, I'm not bitter.)

So why, you ask, would someone spending a fortune of someone else's money going to grad school ruin a perfectly valid arm just to play with circles and gumdrops?

Pac-man was an Uber-exercise in entrainment. You got a jolt of anxiety as you ran from the ghosts, barely making it to a power pill, and then the table is briefly turned—relief—and you chase them. The ebb and flow of tension, the entrainment of the game, made it utterly hypnotic.

Perhaps the interchange between relief and anxiety reaches some pre-historic memories locked in our DNA: stalk the mastodon...stalk the mastodon...run away from the mastodon!.. RUN AWAY FROM THE MASTODON!

Perhaps that's why a twitch game like Pac-man and its many descendants are played mainly by boys (or grad students). Whatever.

Or perhaps not.

In any case, Pac-man holds a key to our conceptualization of interactive educational content: not because it's a game, but because it hews so well to its entrainment. The structure of any interactive content needs to have a similar flow of tension (answering questions and other kinds of user actions) and relief (more passive transfer of knowledge). Too much tension causes frustration, too



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much relief causes enervation. The trick is to find a balance that's appropriate to the affordances of the medium you're using. Just as importantly, the end of the experience—what's required to get there and what it is—needs to be clear from the start.

Interactive educational content requires a more complicated entrainment than a video game. Mere repetition is not a sufficient motivation for an educational experience. Rather, the ebb and flow of tension needs to have a direction, to mount, until a culminating experience is

achieved. So, for educational content, there are really two levels of entrainment: the moment to moment flow and, just as in any narrative, the overall flow of beginning, middle, and end.

One distance learning leader had this collection of books about the field on his bookshelf.

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