

Transformational Play: Why Videogames Matter for Education

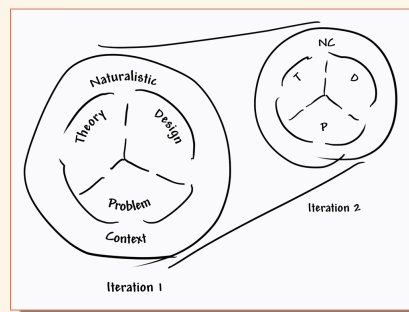


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- National Science Foundation
- John D. & Catherine T. MacArthur Foundation
- Bill and Melinda Gates Foundation
- National Aeronautics Space Association
- Robert Wood Johnson Foundation
- Institute of Educational Sciences
- Fulbright Scholar Program

Learning Scientist

- What is < —————> What could be
- Observation < —————> Design
- Understand < —————> Change



The justification for research does not derive solely from theoretical considerations; it derives from a perceived problem in need of a solution, or an opportunity for humane intervention (Levinson, 1998)

Sport Fishing Outfit





Indigenous Farmers





Logging Company

	A	B	C
Turbidity	6	27	22
Dissolved Oxygen	5.5	4.5	4.0
Temperature	17.5	22.5	22.0
Nitrates	3.15	0.96	2.08
Phosphates	3.6	1.7	3.1
pH	6.6	7.0	7.3

Quest Atlantis

BILL & MELINDA
GATES foundation




MACARTHUR
The John D. and Catherine T. MacArthur Foundation

Multuser virtual environment for grades 4-9 that brings together **education** (learning), **entertainment** (playing), and **social commitments** (helping).

Questers	Missions	Teachers	Schools
52,312	105,993	5,206	750





- > 10 Million in Investment (NSF, MacArthur, IES, Gates)
- > 50,000 users (US, Aus, Can, Sing, Uganda, SA, Italy, China, etc.)
 - Learning gains in science, language arts, mathematics, social studies
 - Dozens of Curriculum Activities, Design Toolkit, Research Toolkit
 - Over two-dozen published manuscripts, and dozens of media reports.

Teacher Toolkit

Videogames offer a new vision for learning, one that is less focused on transmitting content and more focused on positioning learners with intentionality, content with legitimacy, and contexts with consequentiality.

When a fifth-grader acts as a scientist in a virtual world, investigating and posing solutions about a water quality problem, they are learning not only scientific content, but also about what it means to be a scientist and for which situations this knowledge is useful.



Videogames offer

- entire worlds in which learners are central, important, active participants;
- a place where the actions one takes has a significant impact on the world;
- and a place in which *what* you know is directly related to what you are able to do and, ultimately, who you become.



Situativity Theory

- Brown Collins and Duguid (1989) argued that all learning is situated in its context, and its impossible to separate the learner, from the content, or its context.
- “learning, thinking, and knowing are relations among people engaged in activity in, with, and arising from the socially and culturally structured world” (p. 67, italics in the original)
- “Cognition” observed in everyday practice is distributed—stretched over, not divided among—mind, body, activity and culturally organized settings which include other actors.” (Lave, 1988, p. 1)

Theory of Play

- Vygotsky (1933/1978) argued that “the influence of play on a child’s development is enormous...it is a novel form of behavior liberating the child from constraints” (p. 94-95). While engaged in play, a child can function “a head above himself” (Vygotsky, 1933/1978, p. 74).
- Rather, in spending oneself on the task of the game, one is in fact playing oneself out. The self-presentation of the game involves the players' achieving, as it were, his own self-presentation by playing—i.e., presenting—something (Gadamer, p. 108)
- For Derrida, true play is that done “without security” (p. 292). This is play” versus those that are constructed around the question “Is this play?” (Bateson, p. 182).

Theory of Narrative

- What is astonishing about these narrative templates is that they are so particular, so local, so unique—yet have such reach. They are metaphors writ large: their loft is like the loft of a myth. It is the conversation of private Trouble (in Burke's sense) into public plight that makes well-wrought narrative so powerful, so comforting, so dangerous, so culturally essential. (Bruner, 2002, P. 35)
- *Dibbell (1998) wrote that, "while the facts attached to any event born of a MUD's strange, ethereal universe may march in straight, tandem lines separated neatly into the virtual and the real, its meaning lies always in that gap."*

Theory of Transactivity

- *"The basic characteristic of habit is that every experience enacted and undergone modifies the one who acts and undergoes ... For it is a somewhat different person who enters into them ... every genuine experience has an active side which changes in some degree the...conditions under which experiences are had" (Dewey, 1938, p. 35, 39)*
- Transaction, according to the Merriam-Webster dictionary, is "a communicative action or activity involving two parties or things that reciprocally affect or influence each other—changing both."

Transformational Play

... an experiential state that involves:



- (a) projection into the role of a character who,
- (b) is recruited into a partly fantastical problematic context,
- (c) must apply conceptual understandings,
- (d) to transform the context,
- (e) and, ultimately, oneself.

The design goal is to position:

- (1) **context** as places where individuals make decisions that have **consequential impact**,
- (2) **content** as **legitimate tools** necessary for understanding and transforming interesting problematic situations; and
- (3) **players** as change agents with **intentionality** as first-person protagonists in the storyline.

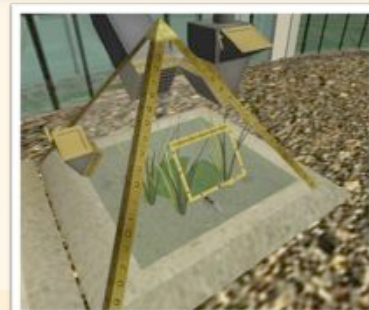
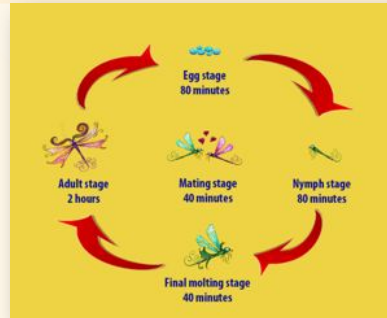


Designing a genetics game



Breeding

- Selecting pairs
- Mating and breeding them
- Two-trait Punnett Squares
- Life-cycle
- Probability



Modes of Engagement

- **Procedural engagement:** using procedures or formalisms accurately
- **Conceptual engagement:** knowing what to do, when to do it, and why it makes sense
- **Consequential engagement:** connecting tool use to implications
- **Critical engagement:** interrogating the usefulness, or significance of the use of particular tools on outcomes

Gresalfi, M. S., Barab, S. A., Siyahhan, S., & Christensen, T. (2009). Virtual worlds, conceptual understanding, and me: Designing for Critical engagement. *On the Horizon (online journal)*, 17(1), 21-34.

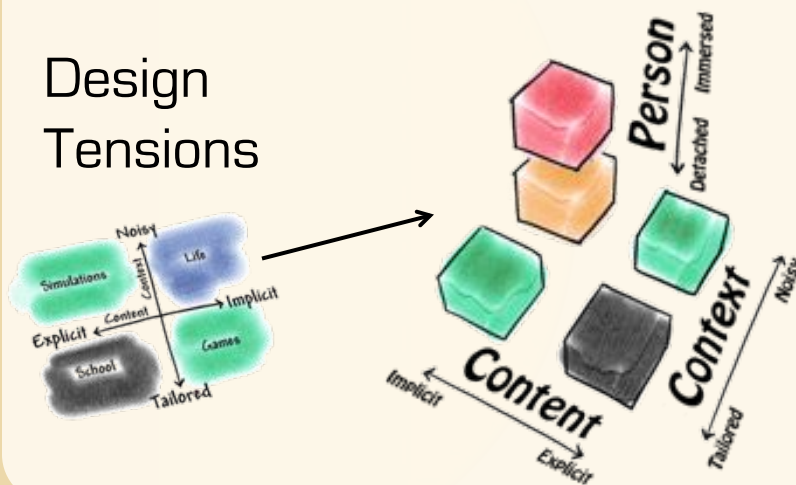
Kid's quest submission: An example of Consequential engagement

Headphones should be allowed at the park because the data shows that if you use the median, which is what I did, then more people spent time at the park if they were allowed to wear headphones.... I decided to use the median because I agreed with Medie and thought with this data to use the median would be best. My median tool helped me make my recommendation because the median was higher if they were allowed to wear headphones at the park. If you use the mode, it changes the whole recommendation to you shouldn't be allowed to use headphones, but for this recommendation, the median is more reliable. Its more reliable because that shows the average. The mode is less reliable for this set of data, because it just shows how many people want the two options....It is important that people choose what they want to do, we should try to satisfy ALL our citizens.



Challenge: Role of the Context

Design
Tensions



- Quest Atlantis
<http://QuestAtlantis.org>



- Worked Examples
<http://WorkedExamples.org>