



DESIGNING EDUCATIONAL GAMES AND THEIR BENEFITS

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ABSTRACT

Educational games are considered interactive activities that should be just as motivating and engaging as regular digital games, but players will learn rather than just be entertained. Despite some limited success over the past few decades, educational games have failed to reach mainstream adoption or success. This chapter claims that such a failure is the result of poor design. Designers can create better educational games once they have a better understanding of how to design games. To this end, three aspects of game design are investigated to see how they relate to the design of successful games. Firstly, how players learn or come to understand something while playing a game. Secondly, how designers can ensure players remain motivated to play the game. Lastly, how both education and motivation should be considered from the perspective of gameplay.

Key words: games, creativity skill, benefits, edutainment, purpose, teamwork, effects, critical thinking, visual memory, leadership.

Introduction:

Traditionally, game designers have “solved” this dilemma by delivering chocolate-covered broccoli. This approach attempts to disguise the “learning vitamins” (the broccoli) under a kid-friendly, seemingly enjoyable veneer (the chocolate). But chocolate-covered broccoli is problematic because it unifies two things that were never meant to go together, like broccoli and chocolate, multiplication facts and crocodiles, vocabulary and crime.

When the learning has nothing to do with the context in which it’s embedded, then a game isn’t helping children to learn in a deeper, more meaningful way — it’s just fancying up a set of flash cards. Not only is this a waste of money (flash cards are cheap! Games are not), but it’s a waste of everyone’s time and talent.

Research has found that rote skill memorization (aka “drill and kill”) has a short shelf life, doesn’t transfer to new situations, and can interfere with deeper understanding. It’s in one ear and out the other. Designers can do better and kids deserve better.

Moreover, these types of games do kids a motivational disservice. That’s right, “a motivational disservice.” By that I mean, they teach kids that learning is a means to an end — the yuck they’ve got to endure to get to the good stuff. Learning isn’t enjoyable in and of itself, these games imply. Learning is broccoli. Blech. We’ll make it okay and cover it in some chocolate.

How do you think that kind of messaging impacts kids’ motivation to learn? Do you think it amps them up to tackle the unknown? Or turn them off of learning and entitles them to treats?

Finally, chocolate-covered broccoli games don't succeed in the market. Kids sniff out chocolate-covered broccoli easily — it reeks of fake fun. And once kids have bounced, you'll never get them back.

What to do? Educational games are worth making. Research has shown over and over that educational games do help children learn.

The trick is to make them not suck. Here are 4 tips, culled from a decade experience of developing and evaluating digital games for learning and a PhD in motivating learners.

Methodology

This section covers the research design, participants, application process, data collection tool and analysis process.

Research design

This study, which was carried out with the participation of secondary school 5th and 6th grade students, employed a single group pretest posttest experimental design research. It subsumed the steps of comparing and analyzing the measurements related to the study group before and after the experimental procedure in single-group pre-test post-test experimental design research (Büyüköztürk et al.,2016). The activities to be carried out within the scope of the study are designed as an after-school activity for volunteer participants. For this reason, the number of participants in the study is limited to 23 students.

Participants

This study was carried out with the voluntary participation of 5th and 6th grade students of a private school in Istanbul who were members of a "Game Design Club" that included 23 students, conducting their extra-curricular activities.

Application process

As a pre and post-test, Torrance Test of Creative Thinking (TTCT) Figural-A form was administered to the volunteering 5th and 6th grade students who agreed to participate in the research. After the pre-test application, the game design curriculum was followed for 14 weeks. With this curriculum, students designed games on three different platforms: (1) on paper, (2) Pixel Floors, and (3) Prototyping. After the completion of all learning activities in the curriculum, TCFT was applied to the students as a post-test. The products produced by the students as a result of this learning experience are presented in Figs. 1, 2 and 3. The research was completed in a total of 15 weeks, including one class-hour per week, pre-test and post-test applications.

Gameplay in school isn't just about having fun though, say Buxton and other teachers, who are increasingly using games and gaming principles to enhance instruction. From Minecraft to the Game of Life and Werewolf, effective games like March Mammal Madness link content with low-stakes competition and can provide a more collaborative, engaging classroom experience—especially for students who may struggle to focus or find their niche in learning. During the pandemic, games have also provided an important outlet that keeps kids connected and motivated remotely.

These claims aren't just anecdotal. According to research, using games in teaching can help increase student participation, foster social and emotional learning, and motivate students to take risks. One study of the popular multiple-choice quiz game Kahoot found that it improved students' attitudes toward learning and boosted their academic scores. In addition, studies have found that virtual games can improve

focus and attention for students with ADHD and help students with dyslexia improve spatial and temporal attention, which can translate into improved reading. But games aren't substitutes for other forms of learning. Like any educational tool, they need to be well-planned and integrated only when they're relevant to the learning objectives.

Think of games not as Band-Aids to fix what's broken in the classroom but as "a pedagogical approach that might help people think differently about what's possible... limited only by a player's imagination and by what a gaming set of rules allows," says Antero Garcia, an assistant professor at the Stanford Graduate School of Education who studies the impact of technology and gaming on youth literacy and civic identities.

Want to integrate well-developed games or just a few gaming principles into your lessons? Here are some approaches to consider to make games a valuable teaching tool.

TEST AND LEARN

In many games, players encounter scenarios that involve making in-the-moment decisions that let them quickly see the impact of their choices in a low-risk setting and then try (and try again) if they falter—skills that are valuable as they go through life, says Garcia..

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