Teaching Math Through Video Games

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There are many video games that try to teach math.
Why Math Video Games?

- Students usually do not want to study math
- Math requires lots of practice
- Attempt to get students to practice while doing something they enjoy
There are different types of math

- Math that requires memorization
  - Addition and subtraction
  - Multiplication and division

- Math that requires understanding of concepts
  - Geometry
  - Algebra
  - Calculus

- Math video games are good at getting students to practice and learn the types of math that require memorization

- Math video games are not good at teaching math concepts
What makes a good math game?

- Goal-oriented
- Active learning
- Staying engaged
- Visualization of concepts
Table 2. Summary of results reported on the use of math computer games

<table>
<thead>
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<th>Reference</th>
<th>Findings</th>
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Research Brief, Kebritchi, et al.
Washington State Algebra Challenge

- June 2013; ~5,000 students; DragonBox
- On average: ~42 minutes to master basic skills
- 45 minutes: 73.4%
- 1 hour: 83.8%
- 1.5 hours: 92.9%
- Requires lectures alongside to really learn algebra
  - “Mastery” mentioned was completing levels with certain scores, not a post-test
DragonBox

- Math: algebra (addition, multiplication, fractions, factoring,...)

http://www.dragonboxapp.com/img/db2s2Low.jpg
DragonBox

- Math: algebra (addition, multiplication, fractions, factoring,...)

http://www.dragonboxapp.com/img/db2s3Low.jpg
DragonBox

- Math: algebra (addition, multiplication, fractions, factoring,...)
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- Math: algebra (addition, multiplication, fractions, factoring,...)

http://www.dragonboxapp.com/img/db2s5Low.jpg
Why was DragonBox so successful?

- Minimal instructions
- Begins with representations, then moves to equations
- Immediate feedback
- Challenges players to solve puzzle (equation) in the fewest moves possible
Conclusions

- Math games do help to improve math skills
- There are some math games which are good at teaching concepts
- Still need teachers
References


- [http://archive.wired.com/geekdad/2012/06/dragonbox/](http://archive.wired.com/geekdad/2012/06/dragonbox/)