

Challenges of Bringing Gaming and Simulations to Scale for Science Learning

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“Every individual that we can inspire, that we can guide, that we can help to start a new company, is vital to the future of our economic welfare.”

— Ewing Kauffman

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The Foundation of Entrepreneurship



The Problem: Why Aren't Games Being Widely Used to Learn Science?

The Answer is NOT

n Because there are no science games

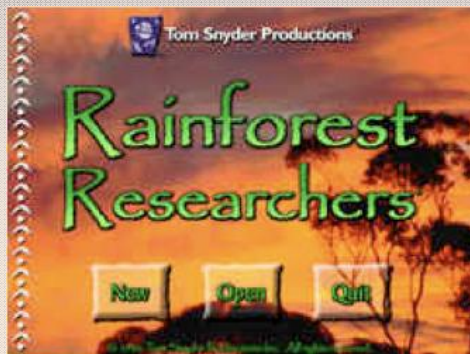


The Answer is NOT

n Because none of the games are any good



DimensionM, Tabula Digita
SIAA 2009 Codie Award



Rainforest Researchers:
Winner of Technology &
Learning Award of Excellence,
NewMedia Invision Award,
Codie Award, and Parents'
Choice Award.



World of Goo: Innovation
Award and Technical
Excellence Award at the
Independent Games Festival.
Gamespot's Critic and User
rankings place Goo above *Call
of Duty 5: World at War* and
Grand Theft Auto 4.

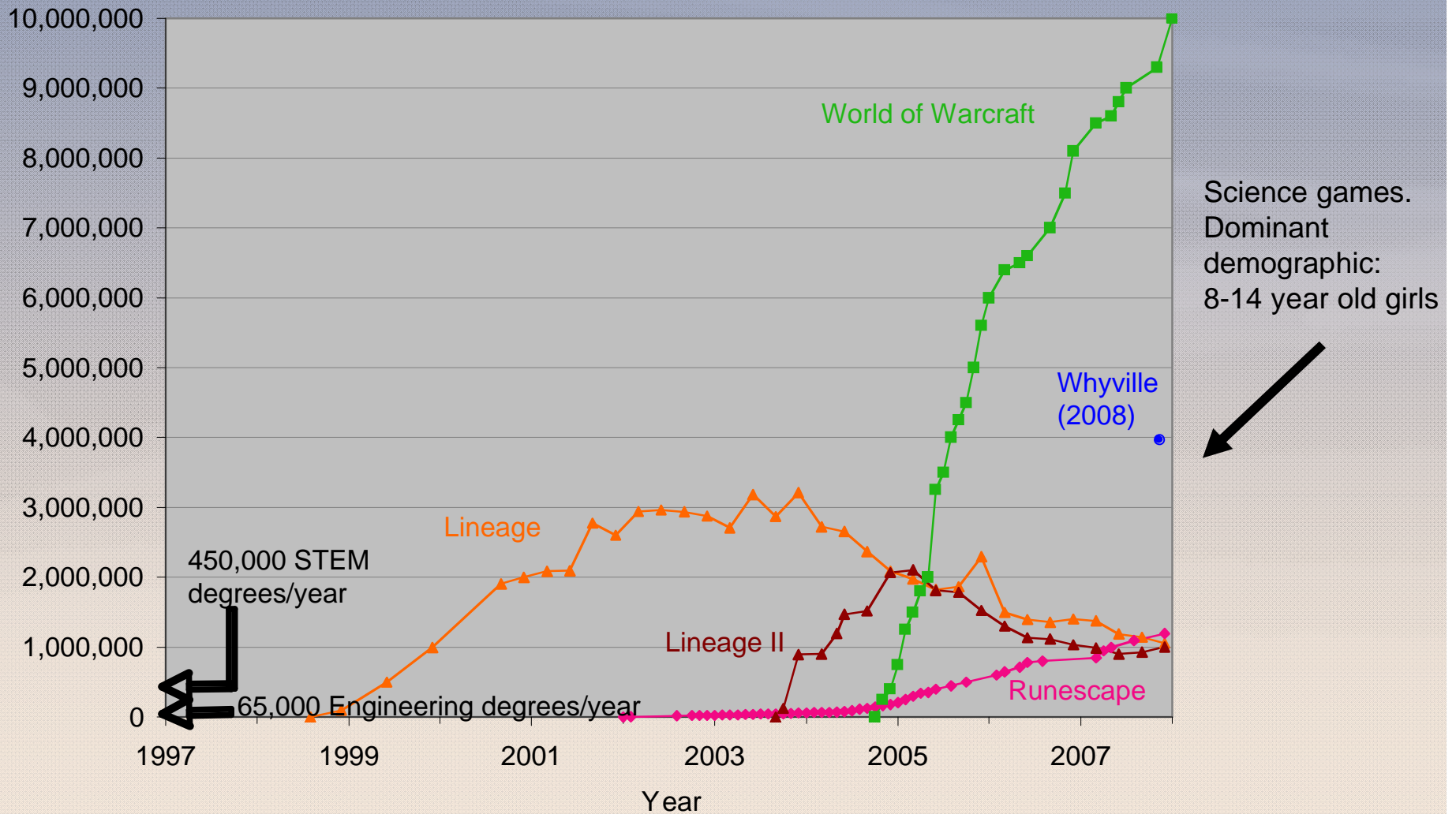
The Answer is NOT

- n Because the graphics are crummy



The Answer is NOT

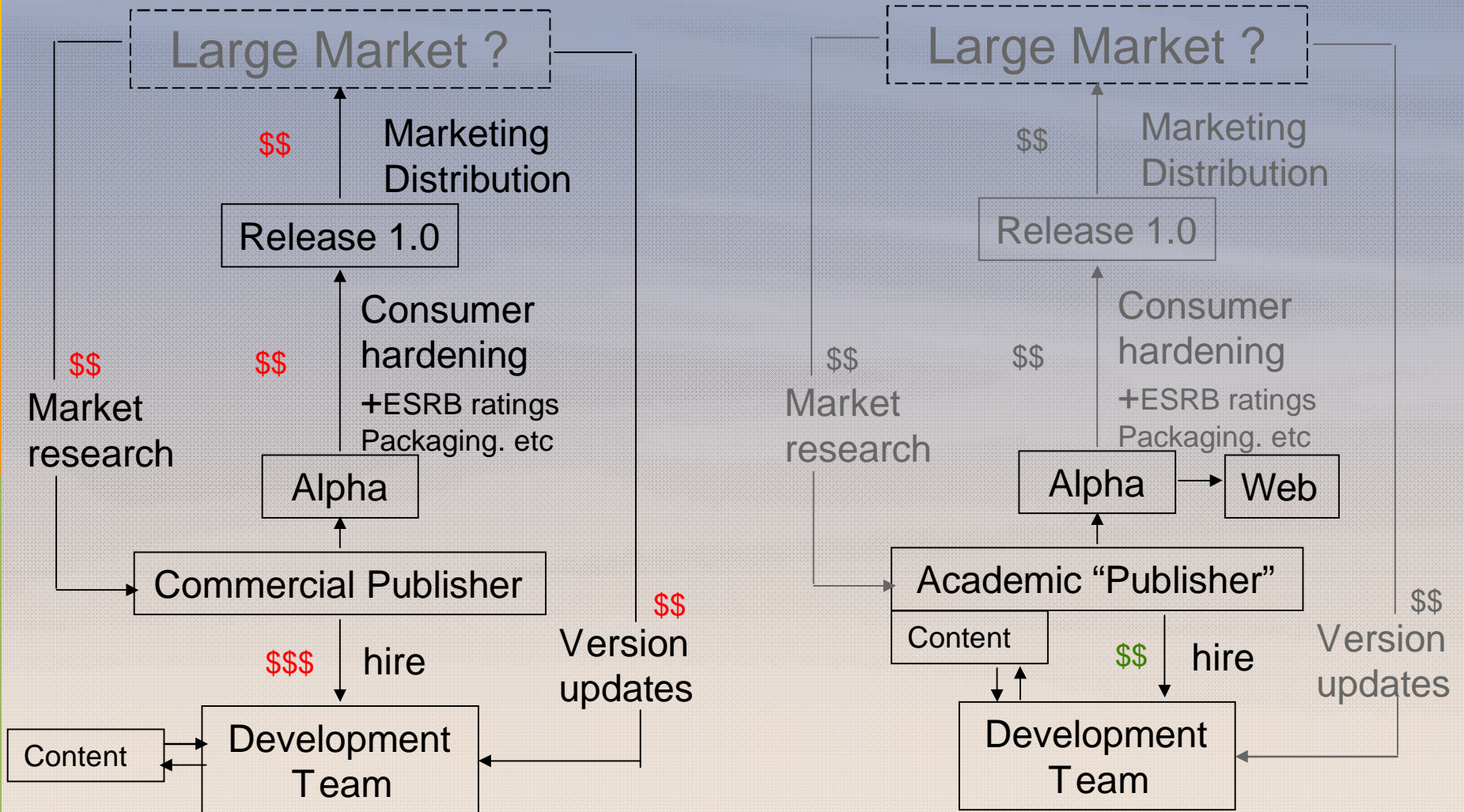
n Because science is boring



The Answer Is.....

Poor Business Practices

Two Approaches, Neither Works



Challenge #1: Sustainability

Who Pays *After* the Game is Made?

n K-12 Schools

- n Teachers (classroom supplies, money, own earnings)
- n District curriculum coordinators, instructional designers (Title I, Enhancing Education Through Technology (EETT), Accelerated Math Instruction (Texas), State of NY Education Stimulus funds, bundled with teacher training....)
- n Money appears to be there, at least for current scope and price of offerings. Getting to the customer is the hard part.

Challenge #2: Distribution

How Do We Get to Them

- n K-12 Market: Really, really tough
 - n Have to create your own distribution network, one in-person meeting, one conference presentation at a time.
 - n Established textbook publishers can't sell games for you, though they may try

Challenge #3: Consumer Acceptance

n K-12 Market

- n See Lee Wilson's *Best Practices for Using Games and Simulations in the Classroom*, published by SIAA.
- n Most of the consumer acceptance issues can be factored into game design up front:
 - n Teacher training
 - n Hardware compatibility (browser-based, flash)
 - n Classroom Use Patterns (<40 min modules, compatible with LMS, mapped to state standards, etc)
 - n Privacy
 - n Security/Safety
 - n Innate acceptance of the technology

Challenge #1: Sustainability

Who Pays *After* the Game is Made?

- n Home Market: Much Bigger
 - n Parents (K-6, well really only K-2) ←—— tough sell
 - n Bundled with hardware (Whyville-Dell, Kauffman-Kajeet)
 - n Hobbyists, Adult Learners
 - n *Wolfquest*: 10,000 users daily, 300,000 downloads; primarily wolf enthusiasts
 - n *Making History*: 40-50,000 commercial sales to history and strategy game buffs
 - n Nintendo DS: 20% of 9.95M users are >30+
 - n *Physicus*: large number of support calls are from adults playing the game
 - n Cisco: games to learn network engineering
- n Potential Untapped Markets
 - n Special Needs and Low-Achieving Children
 - n Overambitious parents of advanced learners

Challenge #2: Distribution

How Do We Get to Them

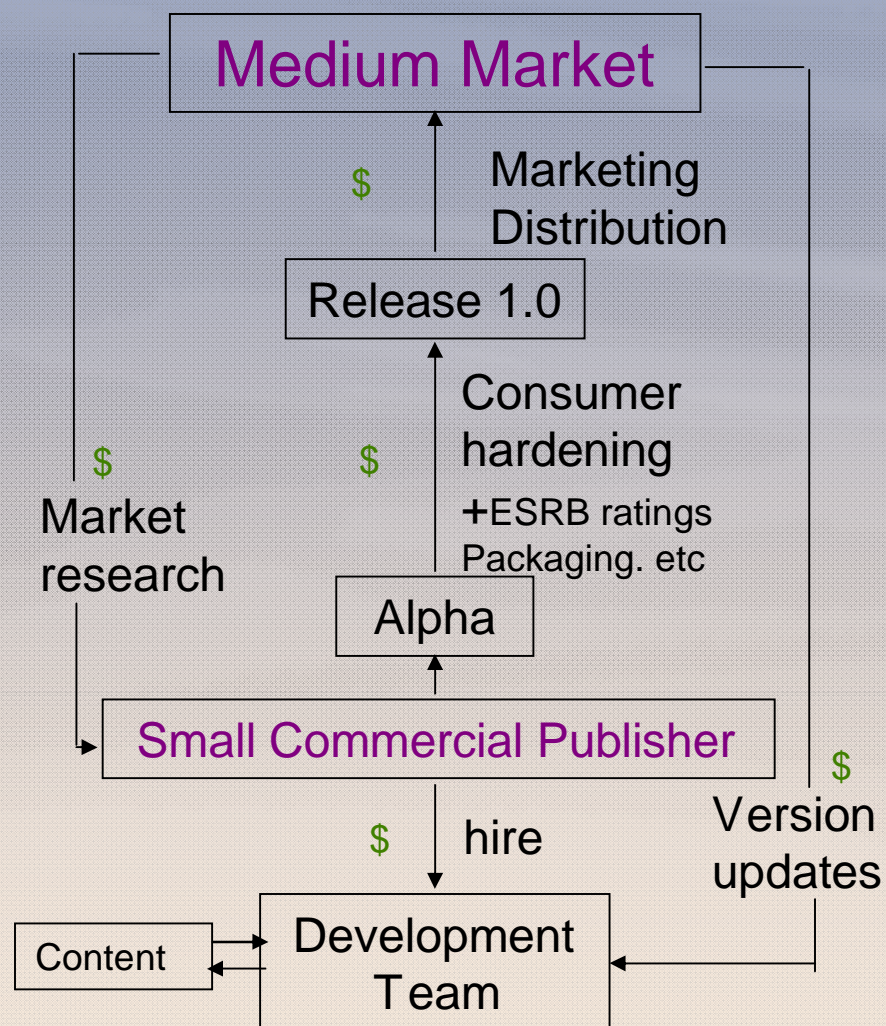
- n Home Market: Much easier
 - n Turnkey Publishers or Publisher/Distributors
 - n Well-trafficked website (usually not yours!)
 - n Kauffman's *All Terrain Brain* on Allterrainbrain.org: 1210 unique visitors/month vs.
 - n Kauffman's *HotShot Business* on Disney.com: 294,934 unique visitors/month
 - n Both 2D flash games
 - n Lots of outside marketing, game reviews, etc. if you need to drive traffic to an obscure website

Challenge #3: Consumer Acceptance

n Home Market:

- n Comparisons to top-of-the line entertainment games invariably depressing
- n More realistic is comparison to books or other learning media:
 - n In 2000, 122,000 new books, 2.5 billion copies sold, so 20,500 per title.
 - n *Whyville*: 4,000,000-5,000,000 users
 - n *Wolfquest*: 300,000 downloads
 - n *Time Engineers*: 80,000 sold through stores
 - n *Making History*: 40-50,000 sold through stores/online
- n MUCH easier than school market
 - n *Making History*: 250 school site licenses
 - n *Time Engineers*: 300-400 school site licenses

Third Way Forward



- o Smaller up-front investment
- o Recoup investment at slower rate over longer time
- o Provide commercial publishing functions

Muzzy Lane Software, Whyville, Second Life, existing K-12 publishers....

Recommendations to the Federal Government

- n All federal “game grants” should require dual academic merit/business plan review (see NIST ATP process)

- n SBIR grants:
 - n Should provide business plan feedback to game developers
 - n Should take shorter than 6 months to review

- n Federal Government should fund research on efficacy of games for low-performing students or other populations that could represent a breakthrough market niche.

- n Federal Government should fund research linking specific game features to measured learning outcomes

Recommendations to Other Entities

- n !!!Philanthropies should establish “bridge loan” funds to small commercial publishers of learning games, to be repaid after 3 years.
 - n Spur commercial co-investment, help keep complementary private sector function alive
- n State Boards of Education should use “textbook adoption” criteria that do not specify “print” and furthermore require proof of learning outcomes improvement rather than topic coverage.