Presentation

Games for Education
How Engaging Can They Be?

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Society of Simulation and Gaming of Singapore

Outline of Seminar

- Why?
    - Potential – Situtated Learning
- How?
    - How do people embed games?
    - Do they learn? – A Study
- James Paul Gee – 3 identities & ZPD
- Why? How?
- Serious Games – Integrated Business Simulation System

About Speaker

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- Make Learning Simple, Fun and Effective
- MSc. Mgmt of Technology NUS Business School
- Games & ICT Adoption research – 3 years, PhD candidate, NIE (NTU)
- Education Consultancy & Online Business: www.edtrix.com
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  - www.econference-sg.com
  - www.GoodNews-Sg.com
- A/P Lim Cher Ping, Prof. John Hedberg

Outline

- "How engaging can they be?" from the perspective of the students, the teachers, the educators and the parents.
- James Paul Gee's perspective of computer games for education.
- Explore what is there for the business simulation world in term of games.

At the end of this talk…

- Confused, Disturbed
- Many unanswered issues
- You have not shown me how

Energy diagram for a single-step spontaneous reaction

- Reflective
- = Successful Talk
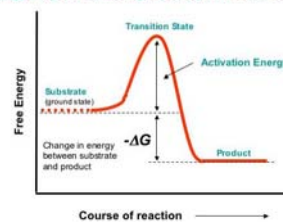
Why?

My friend John Foppe was born with no arms.

But John never asks the question, "Why do I have no arms?"

The question he asks is, "What can I do with my feet?"

- Source: Andrew Matthews, "Happiness Now", p.21

Why?

- Growing Market? Hype?
- 4 out of 5 FutureSchool@SG have virtual worlds
  - Student: I like it.
  - Adult: It is more fun to learn it this way

Professor Robert Bracewell
McGill University
Department of Educational &
Counselling Psychology
Faculty of Education

Use Games: View ☹

- **Distracting – miss learning**
- **Violence perpetrator**
- **Not in exam**
- **Not reading & Writing**

Use Games – View ☺

- <u>Engaging</u>
- <u>Good for you</u>.

- Look who's talking?

Is it good to use Games

- Depends
  - What do you use it for?
  - Classroom Management
  - Pre-requisite skill
  - Lesson Plan – the student dun get it!!!

How do we know which game or simulation to choose?

There is no single answer to this question
- Each time we choose we have - consciously or unconsciously - considered such things as -
  - What do we want the learning to be about?
  - How mature are the participants?
  - How much time is available?
  - What materials are needed?
  - Am I confident I can manage the process and draw out the learning?
- Conscious, careful choices increase confidence and improve the learning quality

Presentation by Prof. Elyssebeth

Educational Theory

Highlight some of them

Situated Learning

- In the situated learning approach, **knowledge and skills** are learned in the **contexts** that reflect **how knowledge is obtained and applied in everyday situations**.
- Situated cognition theory conceives of learning as a **sociocultural phenomenon** rather than the action of an individual acquiring general information from a decontextualized body of knowledge (Kirshner and Whitson 1997).

Activity Theory

4 Major Premise

- A situated learning experience has four major premises guiding the development of classroom activities (Anderson, Reder, and Simon 1996; Wilson 1993):
    - (1) learning is grounded in the actions of everyday situations;
    - (2) knowledge is acquired situationally and transfers only to similar situations;
    - (3) learning is the result of a social process encompassing ways of thinking, perceiving, problem solving, and interacting in addition to declarative and procedural knowledge; and
    - (4) learning is not separated from the world of action but exists in robust, complex, social environments made up of actors, actions, and situations.

Constructionism

- **Learning By Doing** (ISAGA Conference Theme http://www.isaga2007.nl/) - International Simulation and Gaming Association

- **Pioneered by Prof. Seymour Papert, MIT Media Lab**

  "is the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a pubic entity, whether it's a sand castle on the beach or a theory of the universe."

Constructionism...

- Based on the work of Jean Piaget, John Dewey and Maria Montessori and began developing "constructionism" as a strategy for education
- Constructionism asserts that people learn with particular effectiveness when they are engaged in "constructing" personally meaningful artifacts (such as computer programs, animations, or robots).
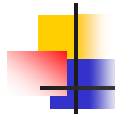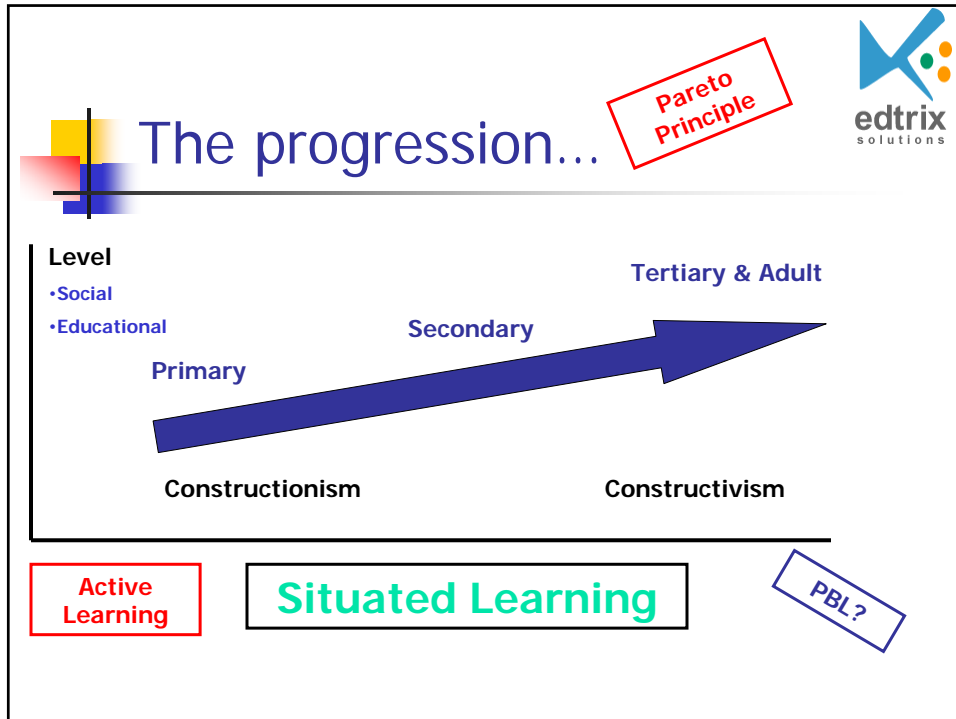
From Papert

- But it is not only in the constructing of something that leaning becomes truly meaningful for the learner.
- **That creation process and the end product must be *shared* with others in order for the full effects of Constructionist learning to take root**.
- We all have times when we need to explain something we know to someone else. To do this, we may have to bone up on the subject, talk with others, draw diagrams. In this process, we learn our subject well because we have to think hard about it and think of the best ways to convey it to others.
- It is through this creation of an object -- ... it could be a website or computer program -- that is shared with others and becomes what Papert calls a "public entity" that Constructionist learning is so powerfully reinforced."

The progression…

Pareto Principle

Level
- Social
- Educational

Primary

Secondary

Tertiary & Adult

Constructionism

Constructivism

Active Learning

Situated Learning

PBL?

References

- Kirschner, D., and Whitson, J., eds. SITUATED COGNITION: SOCIAL, SEMIOTIC, AND PSYCHOLOGICAL PERSPECTIVES. Mahwah, NJ: Lawrence Erlbaum Associates, 1997
- Anderson, J.R.; Reder, L. M.; and Simon, H.A. "Situated Learning and Education." EDUCATIONAL RESEARCHER 25, no. 4 (May 1996): 5-11. (EJ 528 724)
- Constructionism: http://online.sfsu.edu/~foreman/itec800/finalprojects/annmariethurmond/home.html

A Small Study
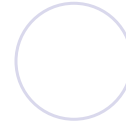
- The Game
- The Study
- Learning points from this Study
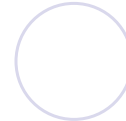

The Game: Runescape
www.runescape.com

- a massively multiplayer online role-playing game (MMORPG)
- with over two million active players using 131 international servers.
- launched by Jagex Limited on 4 January 2001 and offers both pay-to-play (P2P) and free-to-play (F2P) membership options to players.
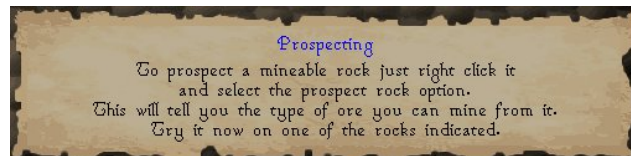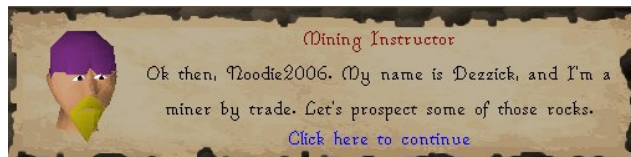
Novice Quest

- The novice quests act as tutorials to acquaint new users with the various skills and abilities they will need in the game and are usually linear in nature.

Embeding Science

- **Alloys: Bronze = Tin + Copper**

Mining Instructor
Ok then, Noodie2006. My name is Dezzick, and I'm a miner by trade. Let's prospect some of those rocks.
Click here to continue

Prospecting
To prospect a mineable rock just right click it and select the prospect rock option. This will tell you the type of ore you can mine from it. Try it now on one of the rocks indicated.

This rock contains tin.

Click here to continue

This rock contains copper.

Click here to continue

Noodie2006

I prospected both types of rock! One set contains tin
and the other has copper ore inside.

Click here to continue

Mining Instructor

Absolutely right Noodie2006. These two ore types can
be smelted together to make bronze.

Click here to continue

Dezzick gives you a Bronze pickaxe!

Click here to continue

The Study

- 20 students (10 in each computer room) – Primary 5
- Scaffolded vs. Non-Scaffolded
- Go through the game to make Bronze Bar.
- All completed within 20 minutes.

Scaffold

- Students are asked to go through the tutorial for Runescape.
- They are asked to look out for the minerals to make the Bronze Bar.

The test

- All 20 students given a questionnaire on their impression of the game +
- What are the 2 minerals used to make the Bronze Bar?
- Group 1: 40% (non-gamer)
- Group 2: 100%

Conclusion

- Scaffolding provides a guide to learning, else the learning point in a game might be missed;
- Game, itself, does not created the desired learning;
- The number of times "tin & copper" reiterated during the game (subtle drilling);
- Story Element

Zonal Proximal Development ZPD
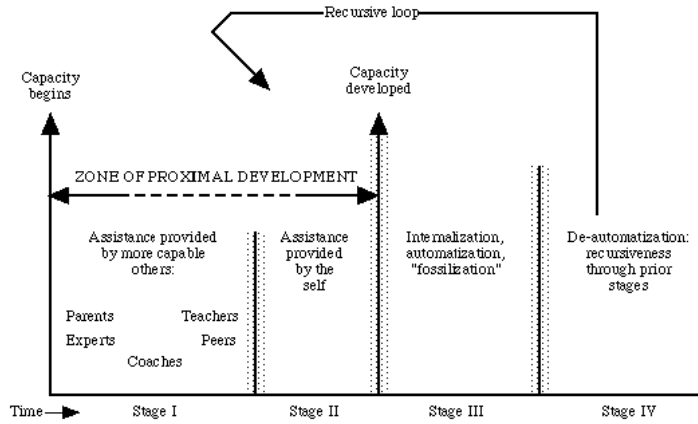
ZPD

- Scaffolding / Instruction
- Little Experiment – <u>Screen Capture</u>

James Paul Gee

- Identity: (p. 54)

Virtual   **Projective**   **Real**

- Probe, Hypothesize, Re-Prode and Re-Think Cycle (p. 90)
  - Reflective Practice

Identities – Games?

- Projective Identity
- Quest Atlantis – Dorothy
  - Real World – petitie, timid
  - Virtual – Many lumins, Luminated
  - Projective – demanding, forceful
- Bring out the potential

Answer to questions?

- How do I use games in the classroom so that my students learn?
- They play computer games, I stop them, they get angry and repulsive.

More Questions

- Violence! How?
- Talk talk talk
- No use ⇆ No Issue

Ninja Gaiden Sigma

Halo 3

- As avenue to talk about it
- Students like to talk about it

So how?

- Pre-requsite Skills
  - E.g. screen/video capture, image manipulation (Typing skill?)
  - IT Skill Inventory
- Focus Area:
  - Hypothesis testing
    - RollerCoaster Tycoon: Which rollercoaster is the most popular?
  - Write a story about the zoo (Images, Video & Text)
    - Zoo Tycoon or Marine Park Empire
  - Marketing/ Design
    - Do a poster for the Zoo or a promotional video?

Engaging Re-visit

- You – Multiple Roles – Parent, Son/Daughter, Educator, Singapore Citizen, etc.
- In NIE/School, talk about Constructivism, at Home, it is Instructivism
- Paradigm Shift

Assessment Doesn't Change, Nothing Changes

By Many Researchers, Educators
from Schools, NIE, etc.

Business Simulation

- MAGNUS, COMPETE, etc.
- Decisionware
  - http://www.decisionwaresim.com/

decisionWare
simulations and games

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Business Simulation

- Research Thesis
  - Virtual Environment – MultiVerse or Second Life
  - Simulation game – Multi-discipline
- Version 1: Jan 2008
- Client: MDIS? UNISIM? ITE West?

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