SEdG

EUNIS 2015 Dørup Award Finalist

Serious EdGames©: Digital innovative serious educational gaming for mobile technology

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Introduction

- Context
  - Professional training module: planning law
  - University of East London, UK
  - Moodle platform

Introduction

- Serious Games: Serious Educational Games – SEdG
  - Kolb's (1984) Learning styles
  - Light, Cox et al (2009) constructivist view of learning

Kolb, D. (1984). Experiential learning: experience as the source of learning and development.

Light, G. P. D., Cox, R., & Calkins, S. (2009). *Learning and teaching in higher education : the reflective professional*

Achievements

Effective leadership

- Team collaboration, stage approvals, resources
- Project delivered and closed a month ahead of schedule

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Pedagogy

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On the way to

- Future – on demand everything

Serious Educational Games (SEdG) Innovations

- Built to support latest desktop and mobile technology
- Engage the technology-savvy learners
- Present ‘boring’ subjects in an engaging way
- ‘learning by doing’ attribute
- As an online game, players could “outlive and demonstrate his individual values, thoughts, and opinions, and be sure that others thoroughly study and acknowledge his character.” (Friedl, 2003)

Friedl, M. (2003). Online game interactivity theory….

Innovations

- Won an e-learning funding for 7 months
- Planning and coordination are critical
- Used pilots and many releases for user acceptance and to showcase to funders

- Barrow and Mayhew (2000) ~ consensus and democracy in rapid application development

Barrow, P. & Mayhew, P. (2000). Investigating principles of stakeholder evaluation in a modern IS development approach...

- Kotter (2012) ~ early short-term wins increased stakeholders confidence

Kolb, D. (1984). Experiential learning: experience as the source of learning and development…

SEdG

Innovations

- Pilot games with built environment learners, professionals and academics
  - Elicit their feedback on games design and implementations
  - What interaction types make games engaging
  - Overcame knowledge and experience gap of learners

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  - Elicit their feedback on games design and implementations
  - What interaction types make games engaging
  - Overcame knowledge and experience gap of learners
- Launch
  - Published games
  - Submitted closure report to funders
  - We delivered the project a month earlier from deadline

Innovations: *Survey* and *Goals* games

- Designed for learners to explore a plot of land, with the intention of deciding on the alignment of a trunk road
- Learners survey the site by controlling the *Character* to walk around the site
- To find out a number of areas on the site where there are particular concerns, e.g. Special Protection Areas

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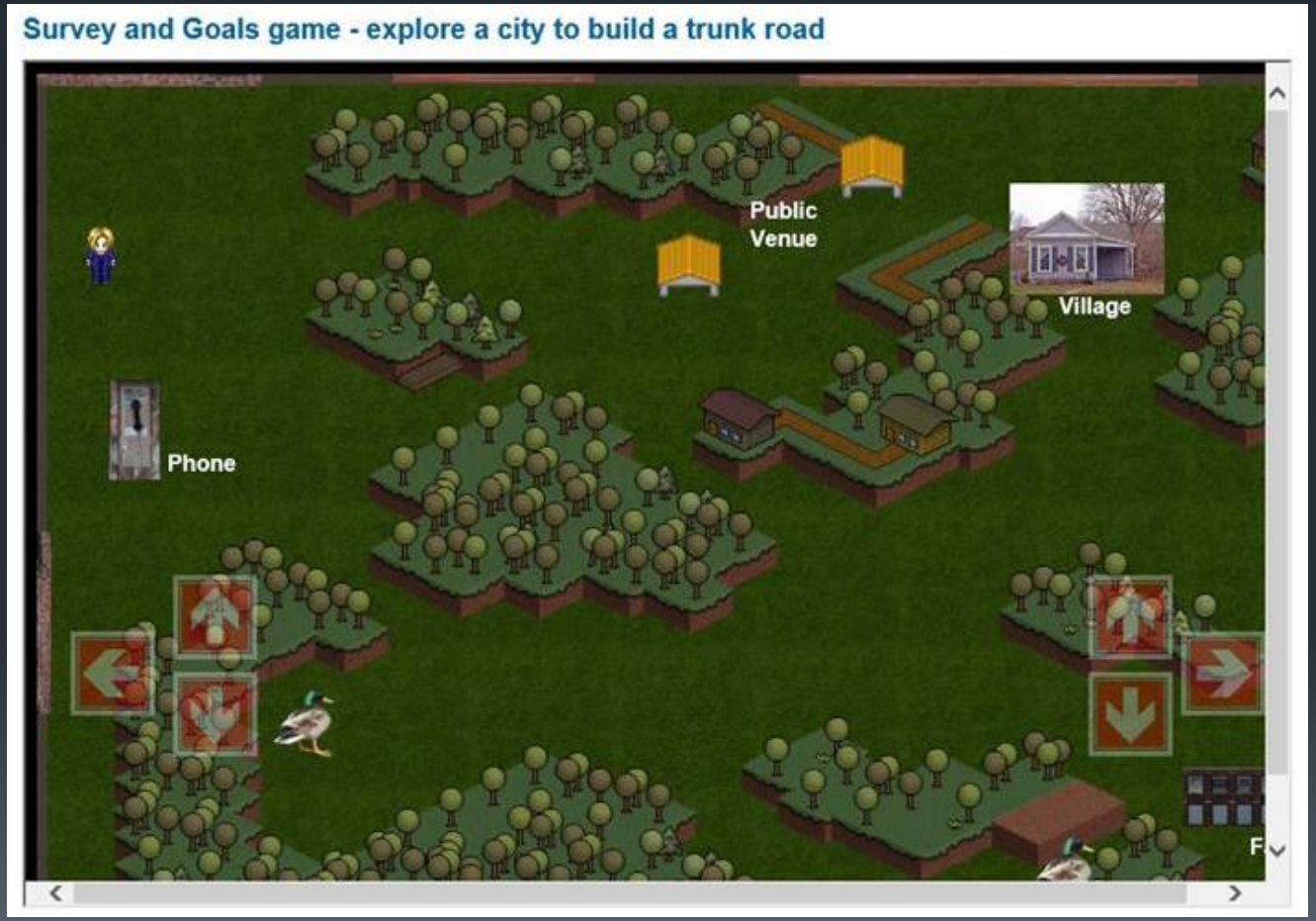
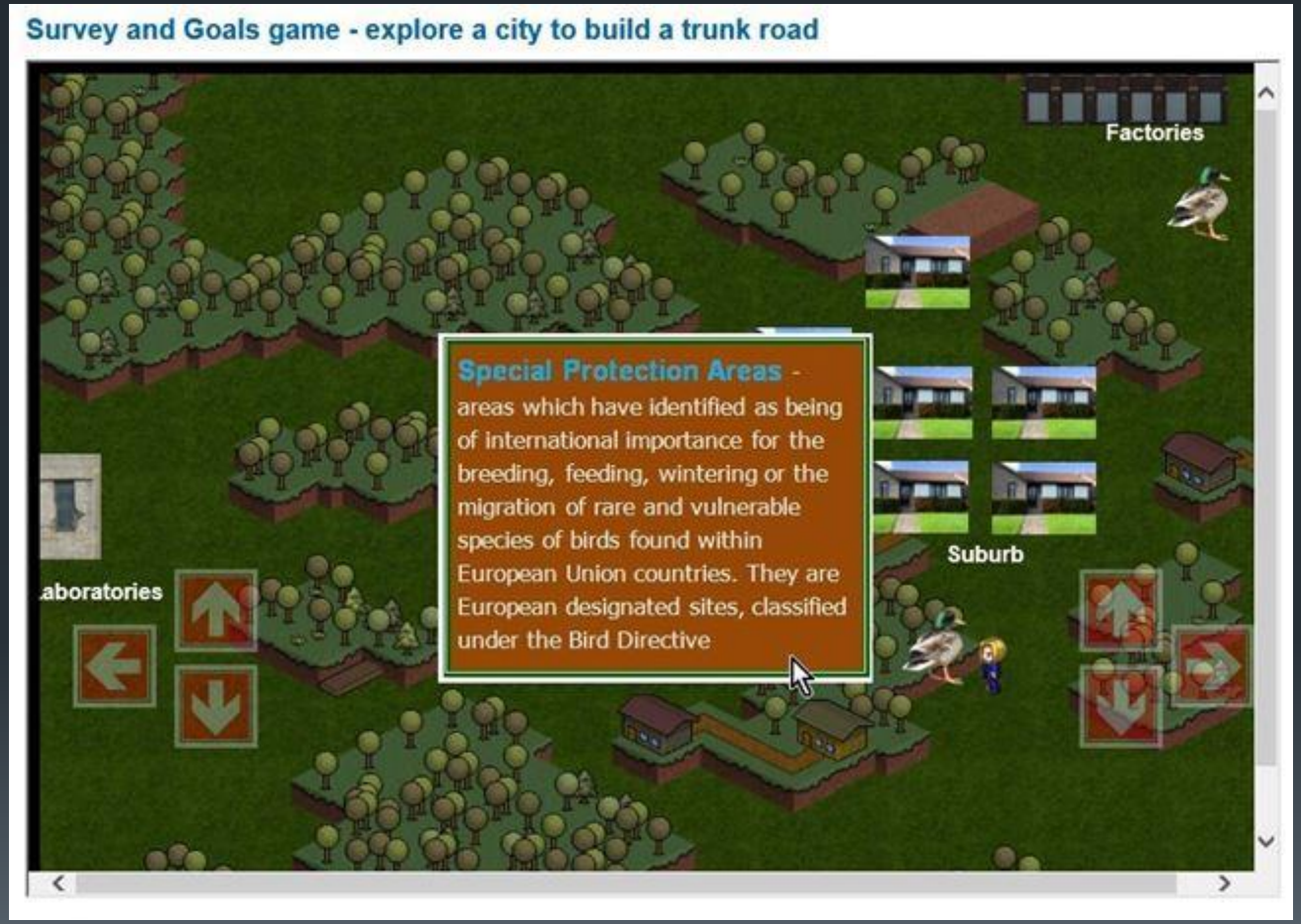
Learners feedback about SEdG

- Much richer style
- More free flow than traditional structured simulation games
- Much less intensive than third-person shooting games

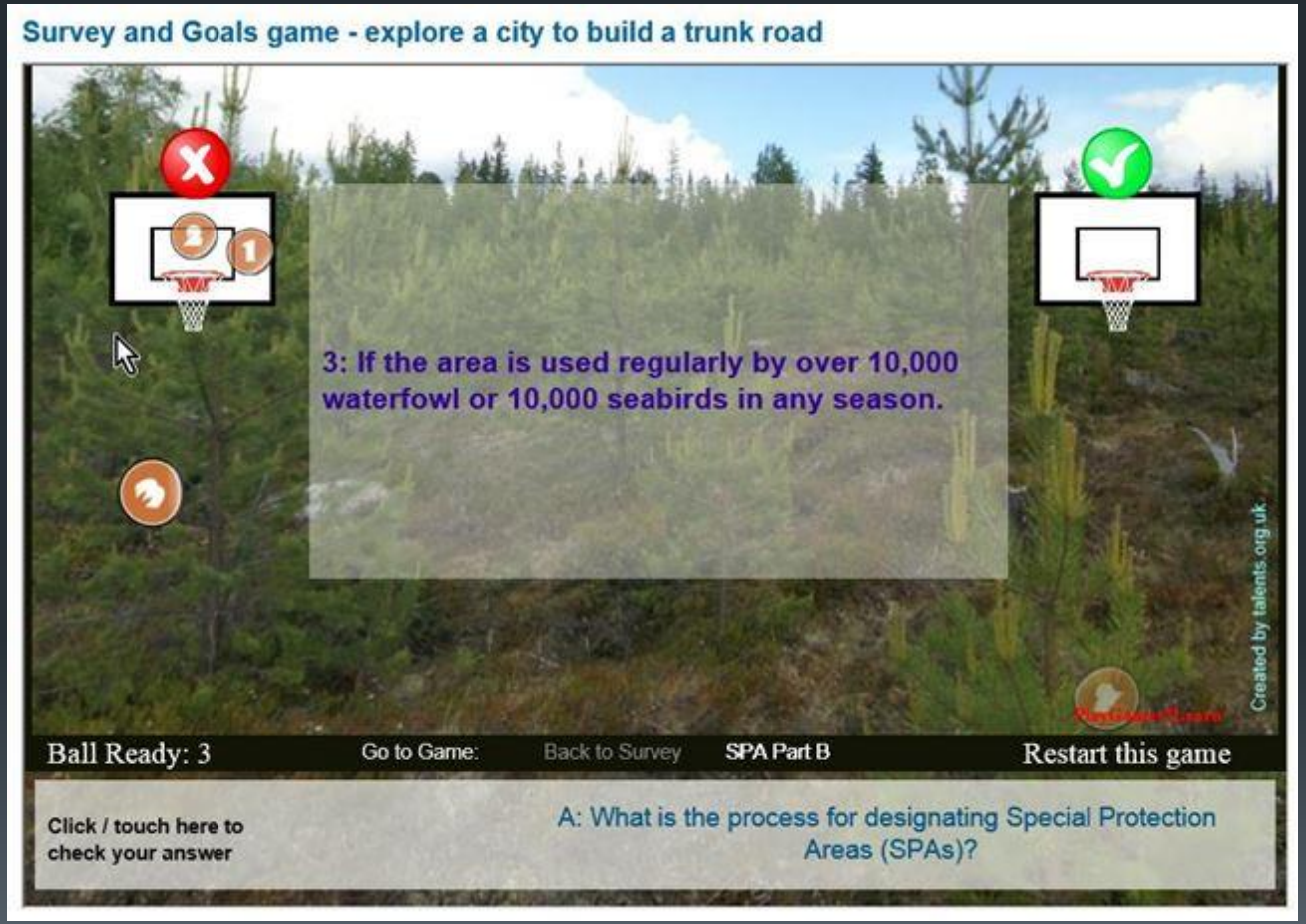
SEdG



Serious EdGame *Survey* integrated into Moodle



Navigating the *Character* to learn about Special Protection Areas, a pop-up explanation is shown



Next stage of the game – *Goals* - learners are presented a series of questions for them to respond

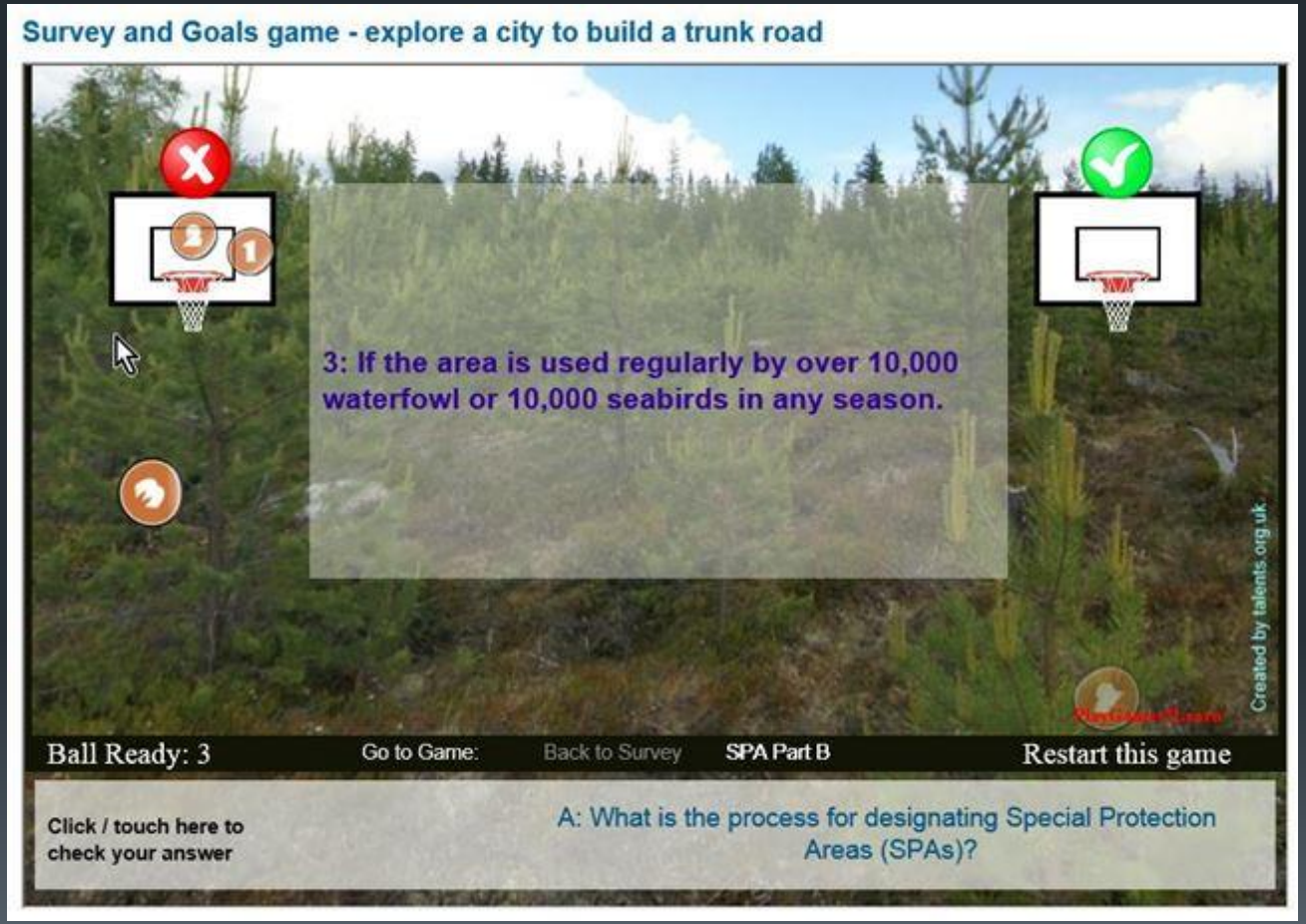
Innovations

Controlling the *Character*

- Using cursor keys on their keyboard, or
- Touching on the on-screen arrow keys (mobile device)

Play games in full screen

- Use designated link (on screen)
- Load game in its own window
- Better playing and learning experience.



Learners consider one statement at a time. They can take as long as they want to "score" each ball. The statement is presented prominently to help focus learner's attention.

Pedagogy

Learning styles

Learners learn better in different approaches to suit their learning styles

Visual learners

- Learn better through visualization
- Pictures, diagrams

Auditory learners

- Learn better through sound, tone, pitch, speed, nuances etc.

Tactile learners

- Learn better by doing
- Engage in interactive activities

SEdG satisfy these learning styles

Pedagogy

Kolb’s Learning styles (cycles)

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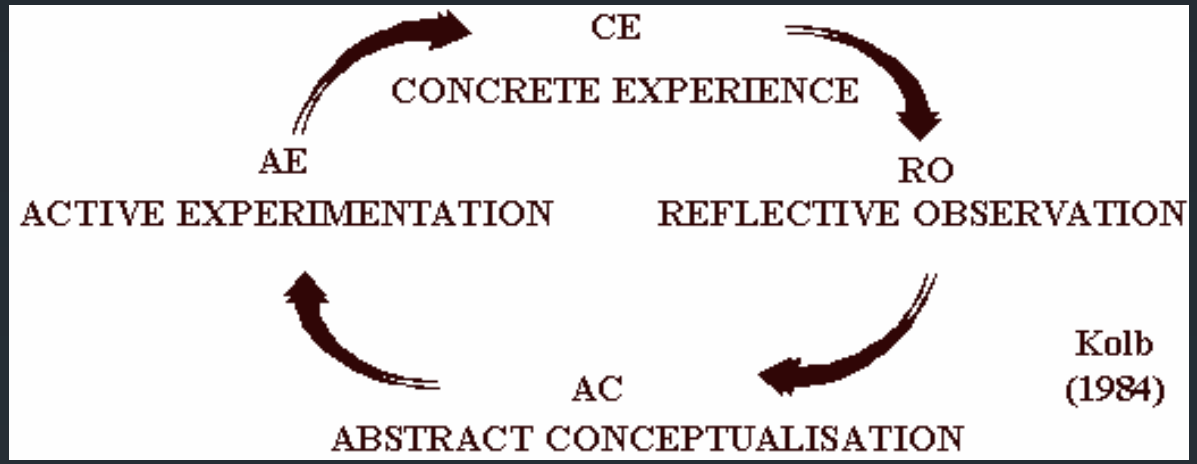
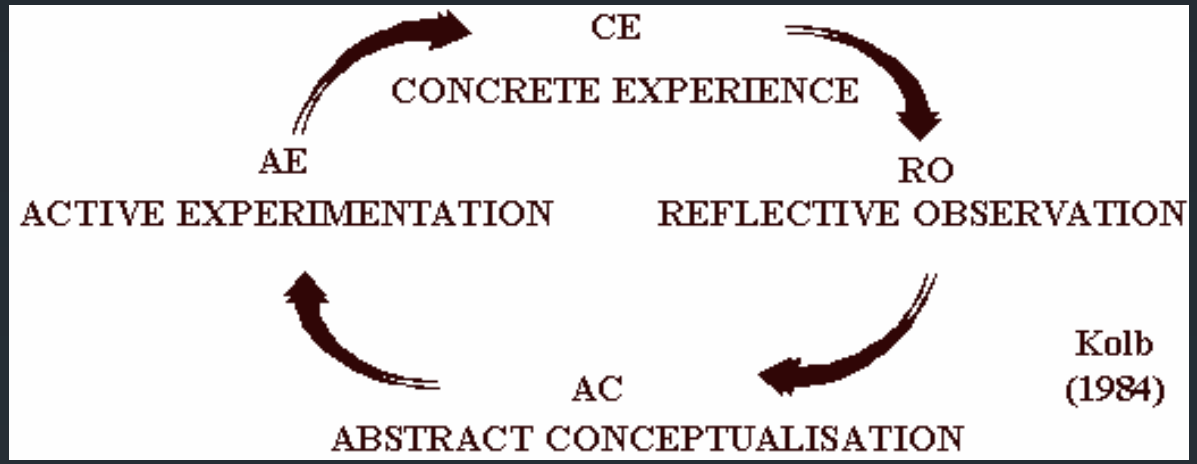


- CE – Learn more effectively by doing

Pedagogy

Kolb's Learning styles (cycles)



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- RO - from the details to the bigger picture. Like to work with others. Learn well from constructive feedbacks

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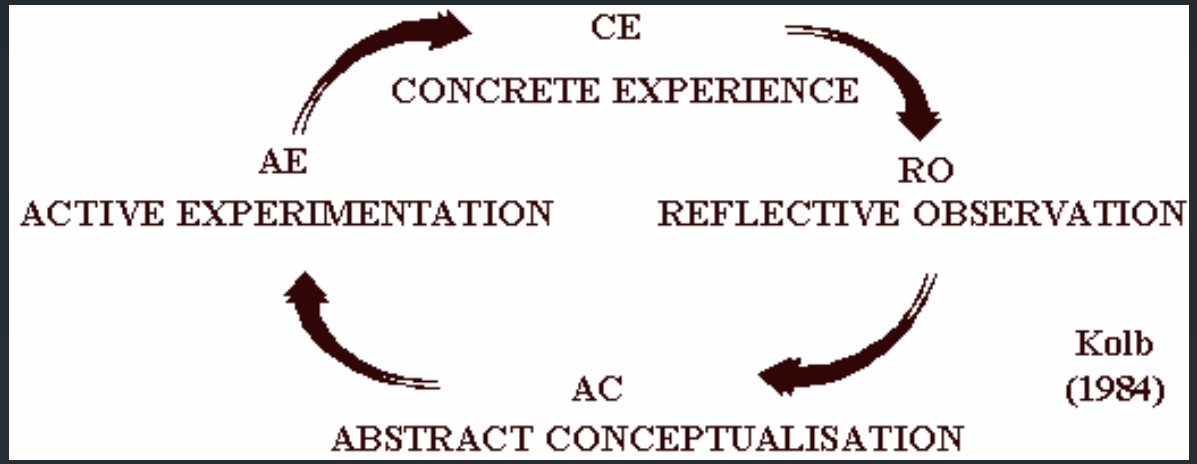

- CE – Learn more effectively by doing
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- AC – thinkers, solve problems, how things work
- AE – prefer thinking than doing; logical and thoughtful outlook

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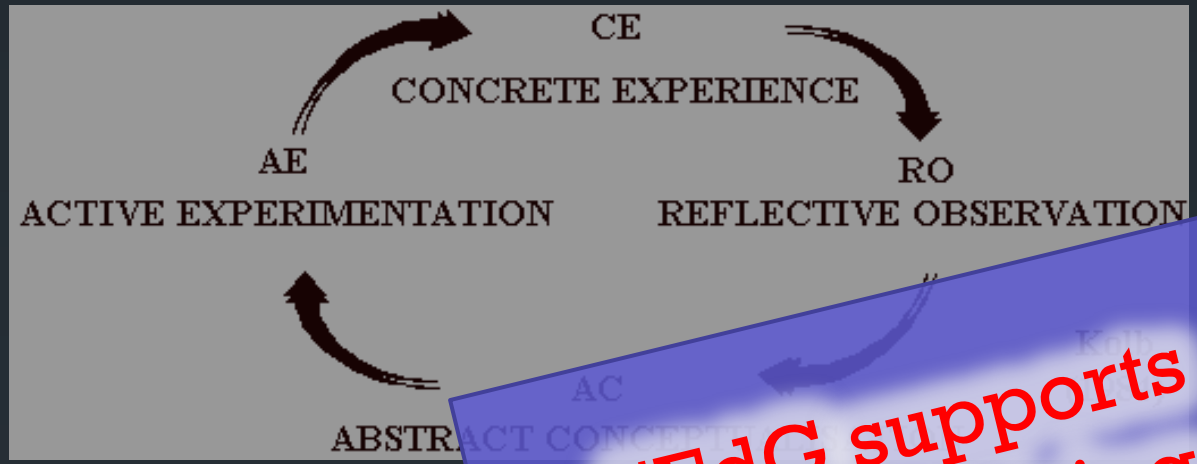
Kolb's Learning styles (cycles)



SEdG supports these learning styles

- CE – Learn more effectively by doing
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- Similar observance made in education is about internal change: learners readiness to learn
- Constructivist view of learning
- Learners build new ideas into concepts based on their prior understanding (Light, Cox et al 2009)

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- Learners: fuller engagement with the material

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- Multiple attempts
- Learners feel much less embarassed compared to a class / social environment

Technology

SEdG game design

- Technology is as importance as look and feel

- Friedl (2003) – online games is an art form in the way the designer conveys the message to players

- Message made up graphical and interactive content, as well as culture and worldview

Technology

SEdG game design

Use of *Character*

- Adds fun to interaction
- Cultivate sense of purpose
- Responsible for own learning
- Virtual social actors create their online presence

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- Virtual social actors create their online presence

- Self-presence can be invoked by an object that represents an individual player
- Avatar reinforces online presence in self-identification

Tamborini, R., & Skalski, P. (2006). The role of presence in the experience of electronic games…

Li, D., Liau, A. et al (2012). Player–Avatar Identification in video gaming: Concept and measurement…

Technology

SEdG game design

- *Survey* ~ virtual world has some resemblance to physical world of survey work

- Not a “closed-up view” for the learners
- Lays out an overall view
- Some degrees of *panning*
- Learners have a strong sense of where they are and want to go to explore further

Technology

- Game development platform: *Construct 2*
- Published games consist of a set of files conforming to HTML5 and web app standards
- Widest reach, platforms and browsers

Technology

- Integration to Moodle by way of embedding
  - Moodle’s strength in classifying and organising materials
  - SEdG provides richer games environment for activity-based learning
- Constraint of Moodle integration
  - Game files on external server, supports real-time updates
- Tested on a wide range of devices

Usefulness and benefits – User survey

Increased enjoyment in learning experience using SEdG more than traditional methods?

- Yes 47%
- No 21%
- Comments
  - “people can learn more easily by loading examples via games”
  - “it’s more interactive way of learning, more fun and more relaxing”

Usefulness and benefits – User survey

Focused better on learning with SEdG compared to reading printed books?

- Yes 29%
- No 24%

Usefulness and benefits – User survey

Increased ability to retain what they learn when using SEdG?

- Yes 29%
- No 21%

Usefulness and benefits – User survey

How likely to use SEdG for learning when there is a choice?

- Yes 24%
- No 27%
- Suggestions
  - Less graphics, sound and animation
  - Show immediate response or checkpoints when learners have done an assessment action
  - “the layout of questions could be a little more attractive with more figures, charts and different design”

Usefulness and benefits – User survey summary

- No significant barriers in using a games approach in general, and SEdG in particular
- No observable issue with nature of online presence (*character*)
- Over 92% of the learners progress to the final year of study towards their professional qualification

Usefulness and benefits – Developer's achievement

Measurable achievement in applying e-learning principles

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- Spend much shorter time compared to instructor-led or text instruction methods
- Maintain a much longer time in the work because of the enjoyable nature of learning by playing

Usefulness and benefits – Developer's achievement

Measurable achievement in applying e-learning principles

- Spend much shorter time compared to instructor-led or text instruction methods
- Maintain a much longer time in the work because of the enjoyable nature of learning by playing
- Involve at a much deeper level of critical engagement with the material
- Relate the work more easily to real-life situations

Usefulness and benefits – Developer's achievement

Measurable achievement in game design maximising re-use and re-purposing

- SEdG games can be modified easily
- Produce different versions
- Different scenarios
- Different questions

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Extending learning styles

- Engaging interactive materials
- No constraint on time, place, size of materials
- Learn ahead (flipped?) for fast learners
- Own management to learning

Usefulness and benefits – Learners with special needs

- Adopt industry best practice on coding standards to support special needs
- Learners have increased control over the medium through which the materials are delivered
- Rich interactive environment increases enjoyment in learning

Transferability of SEdG

Highly transferrable innovation

- Similar organisational culture, into a wide range of technological situations
- File formats conform to best practice
  - Copy files on to web server, open game in web browser
- Any (e-learning) platform that supports web technologies
- Games options make use of text files, supports easy and quick transfer

Conclusion

Proven benefits to learners

- Increased learning outcome
- Increased enjoyment
- Increased more meaningful interaction
- Increased retension
- Increased learning succession / progression

Proven benefits to learning designers and instructors

- Incorporating learning styles and use of rich media

Reducing gap on “play learning” and professional learning

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Any questions?

Thank you for your support and interest

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