Virtual Worlds and Roleplay

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PhD course IPED, UiO: CoRe, Oslo, 06.03.18

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Part 1: Virtual worlds and educational affordances

Outline

- Virtual worlds (VW)
- What it is and key characteristics
- Related areas: VR and AR
- Demo of two virtual worlds: SL and MC
- Strengths and shortcomings of VWs
- Educational affordances of virtual worlds
  - Engagment and learning
- Applications domains, some examples
  - Mathematics, social studies

Virtual worlds: What it is

- 3D Virtual World is a web-based simulated world where three-dimensional graphical representations of individuals (avatars) can interact with each other by using text-based or voice-based tools

- Avatars can move around in 3D space and "do things" by using tools and building blocks

- Users communicate and do things by choosing from a set of tools or commands, and get a feel for the presence of others and distances to virtual objects

Engagement and learning

- Engagement (goes under many names)
  - Creativity (Cipollone, Schifter & Moffat, 2014)
  - Playing and socializing (exploration; interaction)
  - Building and destroying (Lego analogy)
  - Modifying elements (flexibility; create new use)
- Learning in schools
  - Domain-specific knowledge and skills taught by teachers and described in a curriculum
- The two activities are related and should be considered together for full support of learning in virtual worlds

Key characteristics

- Main characteristic of virtual worlds is that they support is immersion, which Dede (2009) defines in terms of :
    - Multiple representations
    - Supporting situated learning, and
    - Transfer of learning

- "Immersion is the subjective experience that one is participating in a comprehensive, realistic experience" (Dede, 2009)

Transfer of learning

- Through immersion in the context of learning supported by multiple representations (richly described virtual settings), learning in new situations leverage resemblance to already experienced situations

- Immersion provide opportunities for learning to learn by reflecting on the learning process,

- Learning to learn is one of several generic skills associated with transfer of knowledge from one situation to another

Immersion in life-like situations

Source: www.gazduireweb.org

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Related to virtual worlds

- Virtual reality
  - An immersive environment that aims to be similar to the real world in order to create a lifelike experience grounded in reality or sci-fi, usually requiring user wearing head mounted gear

- Augmented reality
  - An immersive physical, real-world environment whose elements are "augmented" by computer-generated perceptual information, ideally across multiple sensory modalities

Source: Wikipedia (https://en.wikipedia.org/wiki/Virtual_reality)

Virtual reality example

Source: Wikipedia (https://en.wikipedia.org/wiki/Virtual_reality#/media/File:Reality_check_ESA384313.jpg
)

Virtual world example

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Virtual worlds are often referred to as video games, but not all of them are

- Virtual worlds can be games, but virtual worlds are more general, and many games can be created from general purpose virtual worlds

- Game types
  - Strategy, adventure, simulation, action, puzzle, roleplay, sandbox/open world, and more

- Virtual world are often used for roleplay (e.g. Second Life, SIMS) and sandbox games (e.g. Minecraft)

- What is sandbox game and open world?

Demo of two virtual worlds

- Give live demo of Second Life and Minecraft

Strengths of virtual worlds

- Immersion, movement, and doing (spatial attributes)
- Virtual worlds evolved from one of the most celebrated innovations in the history of personal computing and computer graphics (Sutherland's *Sketchpad* program from 1960s)
- VWs allows modeling phenomena that is either expensive, risky, impractical or outright dangerous to carry out in real world settings
- Mods: Changing or adapting a game to new use by creating, reusing, modifying, and importing code or modules from outside the game

Shortcomings of virtual worlds

- Difficult technology
  - If new to videogames must learn how to use function keys
  - Sound problems (headset, comp. settings, firewalls, etc.)
  - CPU intensive and broad Internet bandwidth requirements
  - Mods are difficult to create in some game environments
- Not all teachers have or wish to attain the skills to build constructivist environments, it require assistants
- Some teachers (especially older) may feel over-whelmed by functionality in systems like Second Life
- It is computational expensive to render 3D graphics in some VWs and users find it is slow; alternatives such as Minecraft might be seem too crudely rendered

Educational affordances

- *Affordance*: The qualities or properties of an object that define its possible uses or make clear how it can or should be used (Norman, 1988)
- Educational affordances (Hollins & Robbins, 2008)
  - *Identify* (experimenting with different presentation of self via an avatar while private person remains anonymous)
  - *Space* (avatars can move in space and feel immersed in it)
  - *Activity* (avatars can do things by creating things and manipulating objects, such as boxes and buildings)
  - *Tools* (tools allow you to create and communicate)
  - *Community* (avatars can communicate, socialize, and role-play and you get a feel for other avatars' communicability)

Theoretical perspectives

- Virtual worlds support sociocultural learning principles (Mørch et al., 2018; Silseth, 2012)
  - Learning situated in a social practice
  - Pedagogical scaffolding
  - Engagement in playful activities (e.g. roleplay)
- .. and constructivist learning principles
  - Active learning
  - Learning by doing
  - Learning new knowledge and skills by building on previous experiences

Application domains

- Roleplay environments have been used to supplement conventional teaching in history, architecture, and languages

- Minecraft have been used for teaching mathematics and architectural modeling but also in social studies, history, and language classes

- These educational virtual worlds should be thought of as a meta-medium (Kay & Goldberg, 1977) as they are general enough to model any other real or computational environment

- Limited only by human imagination

- Think what you can do with Lego and add one more dimension
  - Unlimited access to building blocks
  - Unlimited access to building space

Mathematics application

- From paper by Bos et al. (2014): "Play becomes an opportunity to explore mathematical ideas within an online community"

- Minecraft are used to teach mathematics at all levels in elementary school, according to authors

  – Tasks for Grade 1-5 learning goals, an example

    - *Grade 5-Geometry*: "Understand the concept of volume and relate volume to multiplication and addition"

Social studies application

- *Grade 7 learning task*: Build a model of the Norwegian parliament building (Storting) and create a roleplay that addresses key activities in the process of passing a bill (i.e., creating a new law)

Implications for research

- Research questions

- Research methods

  - Observation (in semi-naturalistic settings)

    - Capturing verbal activity and non-verbal activity

  - Video observation

    - Virtual ethnography

      - Screen capture software

    - Co located settings

      - Video equipment

- Choice of virtual world

  - What is your preference?

Part 2: Roleplaying in virtual worlds

Outline

- Why is role play popular in virtual words and games
- Two studies
  - Cultural Awareness in Military Operations (CAMO)
  - Social LEarning by Design (SLED)
- Focus is on creating and enacting role play scenarios
- Methods, data examples and results

Why using role play in educational studies of virtual worlds and games

- Children have used blocks (of all kinds), Lego (since 1950s) and other toys to play for long time

- Virtual worlds is a modern version of playful environments

- We know more about how such environments increase engagment and joy in players but less about how they support (domain specific) learning

- Several 21st century (generic) skills are triggered
  - Problem solving; creativity; collaboration, etc.
  - More recently: life long learning, learning to learn

Research goals in CAMO and SLED

- Virtual worlds research
  - Creating new (virtual) contexts for collaboration and learning
  - Scenario development and role play as a technique to promote active learning
  - Role of teacher in scaffolding learning in VWs
- Theoretical perspectives (keywords for our research)
  - Social presence
  - Reflective practice
  - Constructivist learning
  - Zone of proximal development

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Methods

- Case study

- Building model worlds for specific domains
  - Afghan village (military training)
  - Virtual classrooms (distance education)

- Ethnographic inspired research methods
  - Hybrid (F2F & distributed) settings
  - Distributed settings (virtual ethnography)

- Data collection
  - Video and voice capture, interview, survey, focus group

CAMO: Cultural Awareness in Military Operations

- Two year project from 2011 to 2012 administered by Norwegian Defense University College (FHS), NTNU (IDI), UiO (InterMedia/IPED)

- *Goal*: Evaluate Second Life as a platform for teaching about *multicultural awareness* for military personnel in Norway (soldiers and interpreters) before deployment to Afghanistan for 6 month service in ISAF forces

- Explore the potential of computer supported collaborative learning (CSCL) as alternative to individual-oriented E-learning
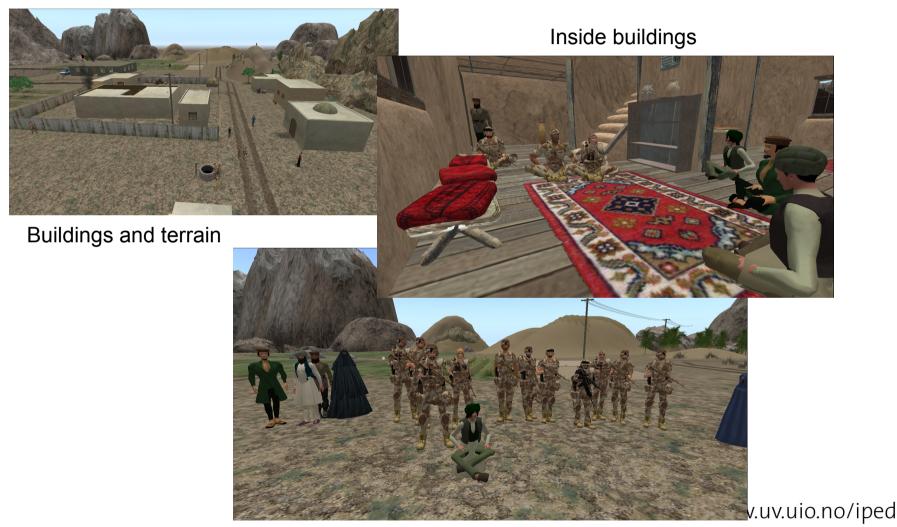
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Multicultural awareness

- An important part of today's training in military academies

- A recent study criticizes military training in Norway for not taking into account

- Multiperspective awareness
  - E.g. gender differences

- Knowledge of foreign cultural symbols
  - E.g. religious symbols

Six learning goals for scneario

1   Minimize communication with children

2   Understand proper interaction with women

3   Recognize the physical features that distinguish an ordinary dwelling from a mosque

4   Proper greetings and introductory small talk with meeting village inhabitants

5   Be able to initiate a meeting with the chief of the village

6   Carry out a conversation with the chief of the village in order to exchange critical information

Model of Afghani village in SL

Buildings and terrain

Inside buildings

Participants (role players)

Source: CAMO project

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Case study

- One-day experiment at Norwegian military academy, Linderud, Oslo
- 11 soldiers in training to become officers, 2 female
- In additions, 4 soldiers were interpreters
- Half of the soldiers had been in Afghanistan before
- 4 Afghani living in Norway played the role of village inhabitants
- All received 1 1/2 hours training in using Second Life in one week before the experiment
- A questionnaire on cultural awareness was filled out beforehand

Experimental setup (computer lab)

Classroom 1: soldiers and interpreters
Classroom 2: Afghani village inhabitants

Sample screen

Attach file: festningen (hele)

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Example roleplay situation

Role play: Talking to woman outside her house, involving male village inhabitant,
soldiers (male and female), interpreter, and two observers from research team   www.uv.uio.no/iped

Sample data transcript (voice chat in SL)

Team leader:	It is nice to hear that all is well here in the village. It seems the security situation is good in the village.
Interpreter:	Taliban attacked us and ISAF soldiers have returned fire
Interpreter:	ISAF soldiers have ransacked the village
Interpreter:	Our people get very angry over this
Interpreter:	The soldiers believe that the inhabitants of the village are Taliban, but there is no Taliban here in the village. Taliban is in Pakistan
Interpreter:	Pakistanis, Chechens, they are not here!
Interpreter:	Our people are very good. Good people!
Team leader:	Yes, but you say your self that there is Taliban attacks here. Do they come all the way from Pakistan to attack here then?
Interpreter:	They come from Pakistan and hide in this area, and attack us

- This excerpt is a dialogue at the end of the conversation between the team leader and the village chief.
- the team leader has managed to get the chief to open up by starting conversation with informal talk
- In this manner he reached the goal to get the necessary information about the presence of Taliban activity in the area.

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Show video clip: Høvding-compund-del-3

CAMO Results

- Method for incremental scenario development
  - Identify goals for learning
  - Describe (mini) scenarios for each goal
  - Define informal scripts for action
  - Activate the participants through role playing, allowing them freedom to interpret their role
- Examples of learning goals
  - Identifying possible threats; correct behavior during a prayer; food during Ramadan; talking to a women; Dealing with children; basic polite phrases in the local language

SLED: Social LEarning by Design

- Distance education master's program in special needs education at U.S. University

- 34 students (and full time teachers) took part the study, met 7 times online , each one 1-hour sessions

- All meetings held in SL, organized by an experienced distance education teacher, who created the world
  - interactive lecturing of theory (concepts), individual activities, small group activities in separate rooms, and role-playing to apply theoretical concepts

- Researchers from our university (UiO) collected and analyzed the data (Mørch et al., 2018)

Teaching theory by 10 minute poster presentations of key concepts while engaging the students in: 1) plenum Q/A , and 2) break out in group rooms to collaborate and practice role play

Teaching theory .. conflict as concept

Collaboration to create role play

Application of concepts in role play

Results SLED

- Role of teacher when teaching in Second Life
  - Allow for social interaction
  - Scaffold the students learning of new technology
  - Plan for activities, procedures, and transitions
- Collaborative activities to engage students
  - Responding to teacher Q/A using voice and chat
  - Creating role play scenarios
  - Role playing (application of concepts)
  - Debriefing with teacher