

MEANING AS ACTION

Understanding

Concepts and words are more meaningful when they are tied to personal experiences



Example

People's understanding of pollution is based on their own experiences of it



Applied to social change

Using examples from everyday life experiences helps people understand inequalities



Applied to games

Games enable concepts and words to be understood through the player's experiences



Game example



'Depression Quest' lets people play the role of someone living with depression. The game raises awareness of depression and suicide prevention.

MEANING AS ACTION

Understanding

Concepts and words are more meaningful when they are tied to personal experiences



Cool things to try in your game

Personalised game experience

Personalised character names
Player chooses character's appearance
Personalise game environment

Cut scenes to recap and set goals

Video clips
Flashbacks
Journal entries
Book chapters
Overview images
Broadcasts audio

Storytelling

Introduction of a protagonist
Introduction of the story
Story plot (e.g. conflict, implications and resolutions)
Perspective of storyteller
Skip scenes
Emotional stories
Dramatic scenes
Story premise
Atmospheric music
Sound effects
Characters' voices

SYSTEMS THINKING

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Understanding

Understanding how skills, strategies and ideas fit into the big picture help people learn



Example

Understanding climate change helps people explain the importance of recycling



Applied to social change

Understanding the shape of society helps people explain everyday inequalities

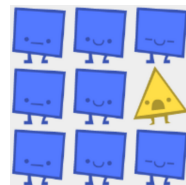


Applied to games

Knowing the objective of the game helps players to understand how to play it



Game example



'Parable of the Polygons' is a segregation simulator used to explore the interaction between social group size and proximity. The players move four types of polygons to form happy groups.

SYSTEMS THINKING

Understanding

Understanding how skills, strategies and ideas fit into the big picture help people learn



Cool things to try in your game

Rules

Game rules
Clear communication of rules
Player tutorial

Game description and outcome

Description of rules
Access to instructions
Game instruction
Questions and answers

Designers' transparency

Designers' voices
Hints on available actions
Consequences of actions

SKILLS AS STRATEGIES

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Problem Solving

People learn and practice skills better when they understand them as strategies for accomplishing their goals



Example

Understanding the importance of practice and training everyday helps athletes win competitions



Applied to social change

People learn and practice ways of treating people fairly as a strategy to reduce social inequalities



Applied to games

A player learns and practices specific skills as a strategy to win the game



Game example



In the 'Citizen Science' game, players learn about responsible actions to save a lake from pollution.

SKILLS AS STRATEGIES

Problem Solving

People learn and practice skills better when they understand them as strategies for accomplishing their goals



Cool things to try in your game

Strategy

Overview of strategy
Description of characters' duties
Illustration of progress in game
Illustration of character's progress

Winning and losing

One way to finish the game
More than one way to finish the game
Incomplete or unresolved endings
Hints on available actions

Goals

Definition of goals
Short-term goals
Long-term goals
Illustration of goals and sub-goals
Missions within the game
Fun goals within the game
Learning goals
Map of the game

SANDBOXES

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Problem Solving

Sanboxes are realistic learning spaces where risks are managed to encourage discovery



Example

Architects create models of houses before building them



Applied to social change

Discussing diferent perspectives encourages people to explore social issues and learn without fearing failure

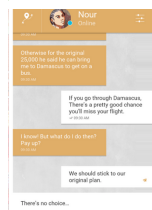


Applied to games

Games offer sandbox levels where players can explore the game without risks



Game example



'Bury me, my love' is a game where a Syrian couple communicates by phone message. The player messages his wife to help her while she flees to Europe as a refugee.

SANDBOXES

Problem Solving

Sanboxes are realistic learning spaces where risks are managed to encourage discovery



Cool things to try in your game

Risk-taking attitudes

Encouraging actions by a reward or penalty
Tutorials levels with no consequences
Repeat task or level when player loses
Re-entry level

Rewards

Self-evaluation score
Information on playing outcomes
Information on learning outcomes
Reward categories (e.g. gifts and lives)
Game levels
Recovery time
Remedial actions

Gaming atmosphere

Fantasy adventure
Trusting environment
Realistic atmosphere
Everyday interactions
Authentic speech and dialogue
Letters from characters
Photos from the past

FISHTANKS

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Problem Solving

Fishtanks are used to manage complex problems by controlling separate elements of the problem



Example

Scientists study river ecosystems by analysing fish in a fishtank and gradually adding more elements from the river environment



Applied to social change

Discussing acts of institutional discrimination helps people understand the causes of social inequalities



Applied to games

Games use fishtanks to avoid overwhelming players



Game example



'1979 Revolution' is a game about the Iranian revolution. Players take the role of a photo journalist to explore the moral dilemmas of increasing complex situations.

FISHTANKS

Problem Solving

Fishtanks are used to manage complex problems by controlling separate elements of the problem



Cool things to try in your game

Different gaming spaces

Tutorials
Game level
Scene change
Houses and rooms

Decomposition of problems

Repeat challenges
Time limited tasks
Interviews with characters
Review characters' answers

Interactions

Increasing complexity of interactions
Interaction between characters
Interaction between objects

Reflective opportunities

Creative writing
Collection of souvenirs
Personal spaces for writing
Pause the game
Character alone time

INFORMATION

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Problem Solving

Providing information when needed enhances learning (e.g. information just-in-time or on-demand)



Example

Road signs are examples of just-in-time information and web-search is an example of on-demand information



Applied to social change

Encouraging curiosity and reflection helps people make use of available information



Applied to games

The rules of the game are available on-demand as a manual or just-in-time as instructions



Game example



'Spent' is a game about surviving poverty and homelessness. Players are given facts about homelessness and poverty to inform their decisions in the game.

INFORMATION

Problem Solving

Providing information when needed enhances learning (e.g. information just-in-time or on-demand)



Cool things to try in your game

Information

Information about the game
Description of the game rules
Information on characters
Educational purpose
Educational content

'On Demand' information

Encourage curiosity (e.g. unusual situations or analogies)
Web-search
Surprises

'Just In Time' information

Signs
Reminders
Indications
Hints

CYCLE OF EXPERTISE

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Problem Solving

Developing expertise through practice



Example

Musicians progress through their grades by practicing and performing set pieces of music



Applied to social change

Learning through cycles of reflection (theory) and action (practice) helps people understand social issues



Applied to games:

Games create cycles of expertise through levels where players develop expertise at solving challenges



Game example



'Code Combat' is a game where players learn how to program. Every line of code written has a direct consequence in the game that the players observe.

CYCLE OF EXPERTISE

Problem Solving

Developing expertise through practice



Cool things to try in your game

Cycle of expertise

Developing expertise through levels

Link theory to practice

Test skills in the game
Gain of character's accessories (e.g. badges)
Access to explanations and training
Mentoring by other characters

Repetitions of actions

Repetition of actions in different contexts
Motivational support
Illustrate progression
Feedback and hints

PLEASANTLY FRUSTRATING

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Problem Solving

Creating challenges that feel hard but achievable enhance learning



Example

Playing sports against people at a similar level makes the competition pleasantly frustrating



Applied to social change

People feeling empowered to learn and act is essential for social change



Applied to games

Games adjust the level of difficulty of challenges and give feedback to players



Game example



'Just dance' is a dancing game with increasingly complex moves.

PLEASANTLY FRUSTRATING

Problem Solving

Creating challenges that feel hard but achievable enhance learning



Cool things to try in your game

Feedback

- Feedback as motivation and information on performance
- Opportunity to learn from mistakes
- Feedback given by the game, characters or objects
- Self-evaluation feedback
- Progress bar

Adjustment of difficulty

- Customisation
- Time adjustment
- Increase or reduce the number of hints
- Tracking performance
- Gaining or losing lives
- Accessories to help the player

WELL-ORDERED PROBLEMS

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Problem Solving

Solving problems in an increasing order of difficulty enhances learning



Example

Learning dance steps before performing a dance



Applied to social change

Starting by reflecting on inequalities in one's own life helps understand larger social issues



Applied to games

The first levels of games help players acquire skills that are needed later in the game



Game example



In 'Dragonbox Algebra 5+' players learn to solve complex calculations. They start with very simple sums before solving more complex equations.

WELL-ORDERED PROBLEMS

Problem Solving

Solving problems in an increasing order of difficulty enhances learning



Cool things to try in your game

Game level design

Tutorials
Increasing levels of difficulty
Use of acquired skills or knowledge

Adaptive approaches

Customisation of difficulty level
Adjusting time available

Structured problems

Overview of the problem
Problems provided by the player, other characters or game events
Multiple ways to solve a problem

MANIPULATION AND DISTRIBUTED KNOWLEDGE

4

Empowered learners

Manipulating things in an environment supports immersion and facilitates learning through exploration



Example

Understanding cultures can be enhanced by visiting countries as well as reading about them



Applied to social change

Critically engaging with other people and objects in different contexts enables people to question and extend their knowledge



Applied to games

Controlling characters and objects helps a player to become immersed in the game



Game example



In 'Quandary' players lead a new human colony where they need to make ethical decisions based on the testimonials of characters they meet.

MANIPULATION AND DISTRIBUTED KNOWLEDGE

Empowered learners

Manipulating things in an environment supports immersion and facilitates learning through exploration



Cool things to try in your game

Player's Control

Control over characters
Control over objects
Clear description of characters' skills
Clear description of objects' attributes

Use of tools

Educational tools (e.g. access to book pages)
Tools for play (e.g. puzzles, games, mazes)

Different perspectives

Compare characters' perspectives
Questioning of characters' knowledge
Reflection
Information revealed by characters or objects

Gaming environment

Different contexts in the game
Description of boundaries within the game

CO-DESIGN

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Empowered learners

Learning as an active process involving interaction with other people



Example

Asking questions and discussing topics helps people develop their own understanding



Applied to social change

Social interaction enables people to learn from one another



Applied to games

Players' actions with characters or other players shapes their gaming experience



Game example



The game 'Nanocrafter' is a scientific discovery game that invites players to explore biology and develop research ideas in an online community of experts and other players.

CO-DESIGN

Empowered learners

Learning as an active process involving interaction with other people



Cool things to try in your game

Consequences of actions

Illustrations of the consequences of player's actions
Irreversible consequences
Replay opportunities

Interaction between characters and objects

Dialogue within the game
Development of friendships between characters or players

Sharing of knowledge

Diary entries
Questions and answers in discussion forums

Interaction between players

Community building activities
Integration with social media platforms

CUSTOMISATION

2

Empowered learners

People have different preferences about how they process and remember information



Example

Some people learn better from visual representations than from text



Applied to social change

Flexibility over how to learn a topic helps people discover ways of learning that suit their skills and abilities



Applied to games

Games can offer a range of different learning and playing styles



Game example



In the football game 'FIFA', players can customise the level of difficulty and competition within their games.

CUSTOMISATION

Empowered learners

People have different preferences about how they process and remember information



Cool things to try in your game

Player preferences

Playing styles e.g. achievers (winning points), socializers (social interactions), explorer (discovering areas), fighters (competition)

Learning styles e.g. visual learners (visualising information), auditory learners (hearing information), reading or writing learners (using text), kinesthetic learners (hands-on experiences)

Different styles

Different styles during the game

Customisation
Adjust level of pressure
Adjust pace
Adjust level of explanation
Adjust time

Different learning activities

Writing and reading activities
Audio statements
Creative expression
Web-quest
Incomplete statements

IDENTITY

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Empowered learners

People's sense of identity changes as they learn



Example

Studying engineering helps people develop their identity as an engineer



Applied to social change

Learning about inequalities changes the way people see themselves and others



Applied to games

Players develop an identity through their characters experiences



Game example



'The Sims' is a simulation game that allows players to project their identity through their characters. It also invites players to explore different identities by playing multiple characters.

IDENTITY

Empowered learners

People's sense of identity changes as they learn



Cool things to try in your game

Customisation

Character's appearance and accessories
Character's personality
Character's abilities and skills
Game environment (e.g. location, music, background)

Clear character goals

Descriptions of character's goals
Tutorials about character's goals
Pop-up information and reminders

Intriguing characters

Unexpected skills or abilities
Counterstereotype characters
Unpredictable character personalities
Character's secrets

Evolution of identity

Developments in character's identity
Developments in player's identity
Physical changes in characters and objects
Characters gaining titles and accessories