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

### 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.

### Applied to social change
Using examples from everyday life experiences helps people understand inequalities.

### Cool things to try in your game

<table>
<thead>
<tr>
<th>Personalised game experience</th>
<th>Cut scenes to recap and set goals</th>
<th>Storytelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personalised character names</td>
<td>Video clips</td>
<td>Introduction of a protagonist</td>
</tr>
<tr>
<td>Player chooses character's appearance</td>
<td>Flashbacks</td>
<td>Introduction of the story</td>
</tr>
<tr>
<td>Personalise game environment</td>
<td>Journal entries</td>
<td>Story plot (e.g. conflict, implications and resolutions)</td>
</tr>
<tr>
<td></td>
<td>Book chapters</td>
<td>Perspective of storyteller</td>
</tr>
<tr>
<td></td>
<td>Overview images</td>
<td>Skip scenes</td>
</tr>
<tr>
<td></td>
<td>Broadcasts audio</td>
<td>Emotional stories</td>
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<tr>
<td></td>
<td></td>
<td>Dramatic scenes</td>
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<tr>
<td></td>
<td></td>
<td>Story premise</td>
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<tr>
<td></td>
<td></td>
<td>Atmospheric music</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sound effects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Characters' voices</td>
</tr>
</tbody>
</table>
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 games**
Knowing the objective of the game helps players to understand how to play it.

**Applied to social change**
Understanding the shape of society helps people explain everyday inequalities.

**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.

**Cool things to try in your game**

<table>
<thead>
<tr>
<th>Rules</th>
<th>Game description and outcome</th>
<th>Designers’ transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Game rules</td>
<td>Description of rules</td>
<td>Designers’ voices</td>
</tr>
<tr>
<td>Clear communication of rules</td>
<td>Access to instructions</td>
<td>Hints on available actions</td>
</tr>
<tr>
<td>Player tutorial</td>
<td>Game instruction</td>
<td>Consequences of actions</td>
</tr>
<tr>
<td></td>
<td>Questions and answers</td>
<td></td>
</tr>
</tbody>
</table>
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 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.

### 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

#### Wining 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
Sanboxes are realistic learning spaces where risks are managed to encourage discovery.

### Example
Architects create models of houses before building them.

### Applied to games
Games offer sandbox levels where players can explore the game without risks.

### Applied to social change
Discussing different perspectives encourages people to explore social issues and learn without fearing failure.

### 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**

<table>
<thead>
<tr>
<th>Risk-taking attitudes</th>
<th>Encouraging actions by a reward or penalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutorials levels with no consequences</td>
<td>Repeat task or level when player loses</td>
</tr>
<tr>
<td>Re-entry level</td>
<td></td>
</tr>
</tbody>
</table>

**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 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 games**

Games use fishtanks to avoid overwhelming players.

**Applied to social change**

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

**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 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
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.

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
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.

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
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 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.

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

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
Solving problems in an increasing order of difficulty enhances learning.

**Example**

Learning dance steps before performing a dance.

**Applied to games**

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

**Applied to social change**

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

**Game example**

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

---

**WELL-ORDERED PROBLEMS**

- **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

---
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 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.

**Applied to social change**

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

**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

- **Different perspectives**
  - Compare characters' perspectives
  - Questioning of characters' knowledge
  - Reflection

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

- **Gaming environment**
  - Different contexts in the game
  - Description of boundaries within the game
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.

**CO-DESIGN**

Empowered learners

**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

- **Interaction between players**
  - Community building activities
  - Integration with social media platforms

- **Sharing of knowledge**
  - Diary entries
  - Questions and answers in discussion forums
People have different preferences about how they process and remember information. Games can offer a range of different learning and playing styles. Flexibility over how to learn a topic helps people discover ways of learning that suit their skills and abilities.

**Example**
Some people learn better from visual representations than from text.

**Applied to games**
Games can offer a range of different learning and playing styles.

**Applied to social change**
Flexibility over how to learn a topic helps people discover ways of learning that suit their skills and abilities.

**Game example**
In the football game ‘FIFA’, players can customise the level of difficulty and competition within their games.

---

**CUSTOMISATION**

Empowered learners

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**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
People's sense of identity changes as they learn

**Example**
- Studying engineering helps people develop their identity as an engineer

**Applied to games**
- Players develop an identity through their characters' experiences

**Applied to social change**
- Learning about inequalities changes the way people see themselves and others

‘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.

**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