Learning outcomes, skills and competences by using games

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Game based learning

- An important form of learning
- Rarely used, “not serious enough”
- Changes with ICT – new approaches
- Collaborative learning, also without ICT
- High quality games involve construction, synthesis and application of knowledge
- Through playing games, the player performs activities, essential in constructivist learning theories
Games and different theories of learning

- **Behavioral approach**
  - Question – response – feedback
  - “Drill and practice”
  - Quizzes, point and click, practicing basic arithmetic operations

- **Constructivist approach**
  - Active role of learner
  - Higher taxonomic levels of knowledge
  - Problem-based learning
  - Teacher:
    - suitable games, guidance and responses, summary of the learning results
Games in pedagogical practice

- Can be used in all levels of education
- Recently used where is very difficult to train people in real situations (e.g. army, healthcare)
- More and more common in education and areas where communication, negotiation and teamwork are required
- Bruner (1966):
  - Learning as an active process
  - People construct their own insights
  - Build on past knowledge and experience
Increasing the frequency of games

- Increasingly popular in recent years
- Easier to build
- The average of people playing games is getting older
- Games on smartphones
When to use games in education

- Game tailored to the desired learning outcome
- Bloom’s Taxonomy
- Types of learning:
  - Cognitive (thinking)
  - Affective (emotional domain)
  - Psychomotor skills (physical abilities and cognitive knowledge)
<table>
<thead>
<tr>
<th>Revised Bloom’s Taxonomy</th>
<th>Definitions of Terms</th>
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<tbody>
<tr>
<td>CREATE</td>
<td>Construct, create, design, put elements together to form a functional whole.</td>
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<tr>
<td>EVALUATE</td>
<td>Make judgments based on criteria and standards through checking.</td>
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<tr>
<td>ANALYZE</td>
<td>Break material into constituent parts, determine how the parts relate to one another</td>
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<tr>
<td>APPLY</td>
<td>Carry out or use a procedure through executing or implementing.</td>
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<tr>
<td>UNDESTRAND</td>
<td>Interpret, classify, summarize, compare, explain.</td>
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<tr>
<td>REMEMBER</td>
<td>Recognize, memorize, repeat from long-term memory.</td>
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</tbody>
</table>

*Table 1 Revised Bloom’s taxonomy with terms*
Learning goals

- Kapp's taxonomy:
  - declarative knowledge,
  - conceptual knowledge,
  - knowledge-based rules,
  - procedural knowledge,
  - soft skills.
Competencies for the 21st century

- Communication
- Collaboration
- Creativity and innovation
Educational games

- Planet Hexagon, a Hex Game, WSF, UVAB, HVL, UL
- StoryLand of Options, a role-playing game, UL
Planet Hexagon

The game promotes among other things:
• Development of creative thinking,
• Communication,
• Intercultural awareness,
• Cooperative skills,
• English language skills.
Testing the game

- Phase 1 (32 students)
- Phase 2 (12 + 9 students)
- Three different aspects:
  - Questionnaire
  - Interview
  - Observing
Results

- Gaining more collaboration skills
  - 70 to 92 %
- Communication in the group
  - 75 to 92 %
- Communication between the groups
  - 47 to 66 %
- Game is cooperative and competitive
StoryLand of Options

The main learning goals of the game are:
• Increasing general knowledge of Slovenia and Slovenian culture;
• Practicing and developing communication and collaboration skills in English;
• Practicing and developing intercultural awareness and tolerance for differences;
• Improving decision-making skills and increasing ability to take practical and effective action, etc.;
Testing the game

- 38 students
- Two different aspects:
  - Questionnaire
  - Observing
Results

- Work of the team on building the story
- Work of the team with other teams to find hidden words
- Communication within the team
- Development of different skills by playing the game
Conclusion

- Both games can be classified at the highest taxonomic level, create, in Bloom’s taxonomy.
- Different types of skills - knowledge-based rules, procedural knowledge and soft skills, in which they develop team communication, collaboration, decision-making, and strategy development.
- Achieved all our goals.
- Fun during the game.
Resources