Game Based learning in the classroom

How (video) games can enhance learning in History, Music and Physics

Education on the Horizon - Teaching and Learning with New Technology
Dr. Yizhen Huang
University of Potsdam - 17th of May 2021

Loreen Bischoff, Lars Büttner, Christoph Rienaß

1. Introduction

"Gaming is not about entertainment, it is about learning."

(Serge Hascoët, Ubisoft)

1. Introduction

Structure

1. Introduction
2. Recap of our last session
3. History
4. Music
5. Physics
6. Discussion
7. References

2. Recap of last session

- **Gamification**
- **Gameful Learning Environment:**
- **central point: operant conditioning**
    - Reinforcement > behaviour occurs more often
    - Punishment > behaviour occurs less

- **ideal learning environment:**
    - actively encourages taking challenges
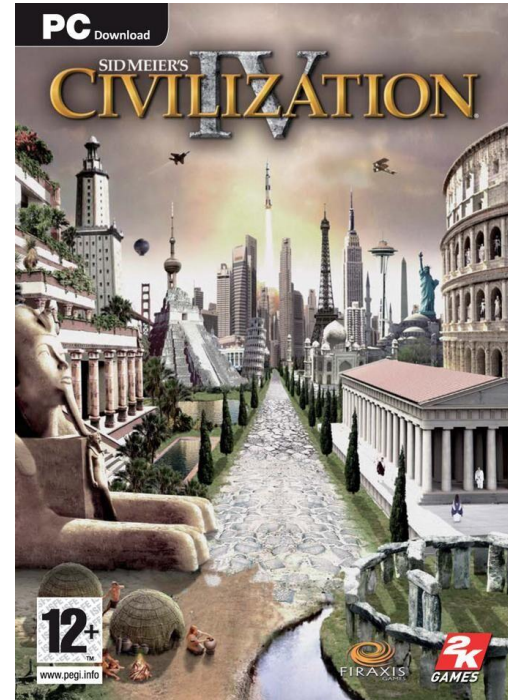   - punishments not too harsh

3. History

3. History

- **establishing familiarity** with historical events, characters, parties etc.
- player becomes part of historic world, ability to **recreate history**
- **application of knowledge** acquired in class

https://civilization.fandom.com/wiki/Civilization_IV

3. History

https://www.youtube.com/watch?v=l_KOpq_BH1g

4. Music

Game-Based Learning of Musical Instruments: A Review and Recommendations

October 2016

Conference: 10th European Conference on Games Based Learning · At: The University of the West of Scotland, Paisley, Scotland

Projects: TELMI (Technology Enhanced Learning of Musical Instrument Performance) · Technology Enhanced Learning of Musical Instrument Performance

Authors:

Margoudi Maria
HighSkillz Ltd

Manuel Fradinho Duarte de Oliveira
KIT-AR

George Waddell
Royal College of Music

4. Music – Technology in Music Learning

https://www.computerweekly.com/photostory/2240108367/Photos-Real-robots-not-in-disguise-walking-and-working-among-us/7/Music-playing-Toyota-robot

4. Music – Technology in Music Learning

4. Music – Games in Music Learning

https://www.scarymommy.com/hand-clapping-games/

4. Music – Games in Music Learning

serious game: "a **mental contest**, played with a **computer**
in accordance with **specific rules**, that **uses entertainment to further
government or corporate training**, **education**, health, public policy, and
strategic communication objectives." (Margoudi et al. 429)

4. Music – Games in Music Learning

4. Music – Games in Music Learning

4. Music – Games in Music Learning

https://www.rockpapershotgun.com/resident-evil-village-music-box-how-to-solve-the-music-box-puzzle

4. Music – Approaches for Music Education

1. **Audio-Based Games (ABG)**

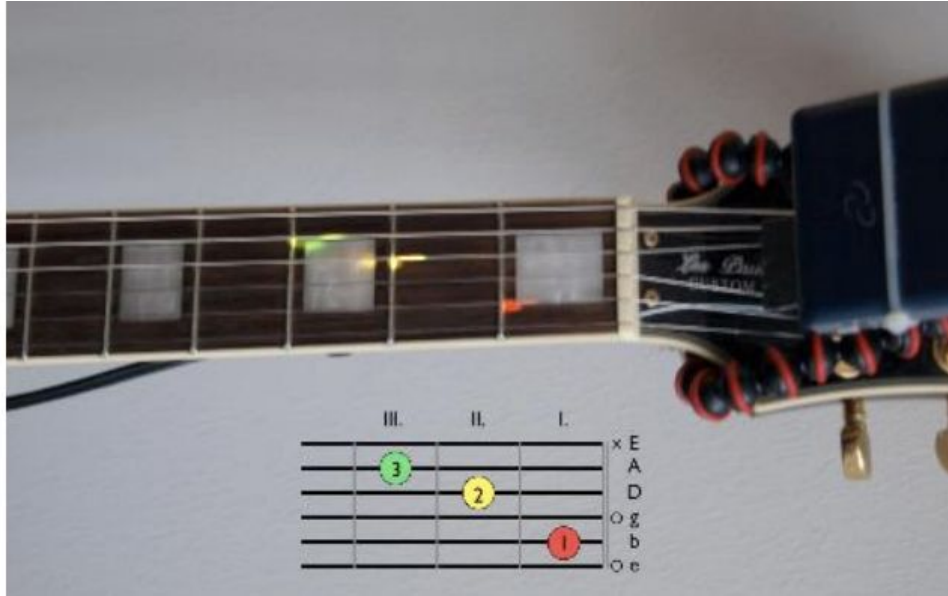   -   sound as central element
    -   high entertainment quality

2. **Computer-Assisted Musical Instrument Training (CAMIT)**

    -   real-time feedback through digital means
    -   aimed at novice learners

4. Music – GBL in the Music classroom

http://www.m-hikari.com/ces/ces2016/ces9-12-2016/p/CES6441.pdf

5. Physics

5. Physics

Trailer: https://www.youtube.com/watch?v=wGHICSMGO04

5. Physics

5. Physics

Table 4: Results of the Pre-Test and Post-Test Spaceflight Knowledge Assessment in Phase 1 (New KSP Players, $n = 11$)

Test	Mean Result (%)	SD	Min	Max
Pre	43.69	23.31	8.33	71.67
Post	70.12	13.70	42.04	93.70

Oberdörfer/Latoschick 2019, p. 25

6. Discussion

1. Which of the presented GBL approaches do you find useful? Why?

2. In which other subjects could GBL be implemented?

7. References

- Grove, T./ Schaller D. T. (2007): "HISTORY BYTES: Playing Games with History". *History News, 62(3),* pp. 5-6.
- KBS Logo: https://de.wikipedia.org/wiki/Kerbal_Space_Program#/media/Datei:Kerbal-space-program-logo.png
- KBS Trailer: https://www.youtube.com/watch?v=wGHICSMGO04
- Kunze, T. (2019): "Video Games and the Education System". in: Elmenreich, W. et al. (Ed.): *Savegame. Agency, Design, Engineering*. Wiesbaden: Springer, pp. 34-40.
- Margoudi et al. (2016). Game-Based Learning of Musical Instruments: A Review and Recommendations.
- Oberdörfer, S./Latoschick, M. E. (2019): "Predicting Learning Effects of Computer Games Using the Gamified Knowledge Encoding Model". *Entertainment Computing,* 32.
- Wainwright, A. M. (2014): "Teaching Historical Theory through Video Games". *The History Teacher, 47(4),* pp. 578 - 612.