Advances in Gamification in Education

Reza Hajari, Won-Sook Lee

School of Electrical Engineering and Computer Science. University of Ottawa

Contact email: rhaja050@uottawa.ca

IARIA

uOttawa

Reza Hajari

- Reza completed his Bachelor's degree in Software Engineering in 2017. He started his Master's degree in Computer Science (CO-OP and Thesis) in University of Ottawa in 2018. He worked at BlackBerry QNX from May 2019 to December 2019 as a Core OS Software Developer for his CO-OP program. From 2014 to 2016, while studying, he also worked on video game development using Unity3D and Unreal Engine 4 with C# and C++ programming languages. He is currently finishing his master's thesis with the title of "*Application Programming Interface for Gamification in Education*".

Introduction

- Online education and COVID-19 pandemic.

- Gamification as a tool to improve class engagement.

Usage of Gamification

- Gamification has been around for a long time.

- Rewards, ranks, achievements and labels.

- Gamification market share in 2020 is US$ 9.1 billion and is set to grow up to US$ 30.7 billion by 2025.

uOttawa

Design of Gamification

- Strictly reward based gamification problems:

  - System should always give more and new rewards.

  - The users might get tired and be less motivated toward achieving more rewards.

- A video game design view could help gamification designers.

- The idea of adaptive gamification.

uOttawa

Adaptive Approach in Gamification in Education

- Static adaptation in gamification in education

  - User categorization into learner profiles.

  - Changing game elements according to the learner profile.

- Dynamic adaptation in gamification in education

  - User categorization into learner profiles.

  - Adapts to user's behavior and activities.

  - Customizing gamification game element pool.

  - Changing the functionality of a game element.

  - Can be done beside the static adaptation.

uOttawa

Adaptive Approach in Gamification in Education

- Results of different studies that employed adaptive gamification in education:

Paper[1]	Results				
	Duration	Type	Profile	Activity	Effectiveness
[13]	Short	Dynamic	-	Performance	Positive
[14]	Short	Dynamic	-	Performance	Positive
[15]	Long	Static	Personality	-	Positive
[16]	Long	Static	Player Type	-	Positive
[17]	Long	Static	Personality	-	Positive
[18]	Long	Static	Player Type	-	Positive
[19]	Long	Static	Player Type	-	Mitigated
[20]	Long	Static	Player Type	-	Mitigated
[21]	Long	Dynamic	-	Behaviors	Mitigated

1. Paper names are corresponding the references in the paper.

uOttawa

Adaptive Gamification Model in E-Learning

- Adaptive Gamification model for E-learning adapted from [1]
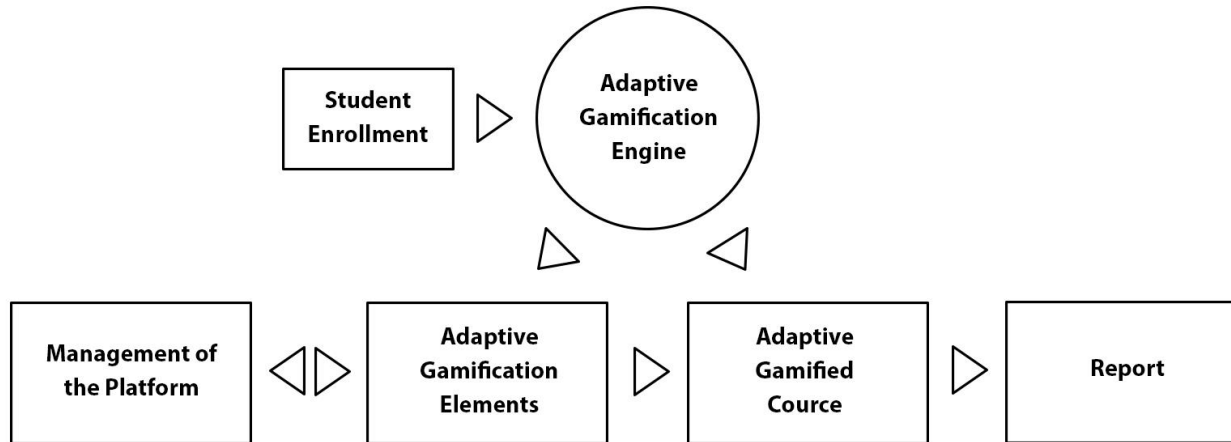
[1] S. Kamunya, E. Mirirti, R. Oboko and E. Maina, "An Adaptive Gamification Model for E-Learning," 2020 IST-Africa Conference (IST-Africa), 2020, pp. 1-10, 2020.

Effectiveness of Gamification

- Gamification in Higher Education Institutions.

- Massively Multiplayer Online (MMO) game as a gamification tool.

- 24 Business students participated.

- Feedback was mostly positive.

- Some students were not sure about the system assessment.

- A comprehensive explanation of how the system works is needed.

Narrative for Gamification in Education

- Gamification systems and video games are comparable.

- Following features are needed for a gamification narrative:

  - Actor: learner or student.

  - Choice: options for progression.

  - Interactivity: system should response to users' actions.

  - A sequence of events.

  - Space, time and date of interactions.

uOttawa

Conclusion

- Gamification in education has gained more attention and has improved over the years.

- Problems that still remain unresolved:

  - Not enough real life evaluations of the systems.

  - Size of the test audience.

  - Duration of the tests.

  - Lack of proper assessment.

  - Inability to scale previous results for different cases.

uOttawa

Future Work

- Comparing the gathered data from different literature reviews in adaptive gamification in education.

- Correlating previous results to different and new contexts.

- Analysing all the other aspects of gamification that have not been discussed in this paper.

uOttawa

Advances in Gamification in Education

Thank you!

Reza Hajari, Won-Sook Lee

Contact email: rhaja050@uottawa.ca

IARIA

uOttawa