Politecnico di Torino
Dipartimento di Automatica e Informatica

PhD in Computer and Control Engineering
XXXV cycle

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Gaming for Sustainability:
Theoretical Framework for the Analysis and Design of Games Promoting Sustainability Skills and Attitudes

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1. Introduction

Multiple interacting environmental, social and economic phenomena generate sustainability complex problems which demand non-traditional solutions [1]. Developing sustainability complex problem-solving skills and attitudes requires specific learning environments and it should be the central focus of contemporary education [2]. Even though games centred on simulation gameplay mechanics can satisfy these requirements, game developers and researchers need new methodological tools which integrate the gameplay process, learning process and complex problem-solving process in order to address the need for sustainability [3].

2. Aim

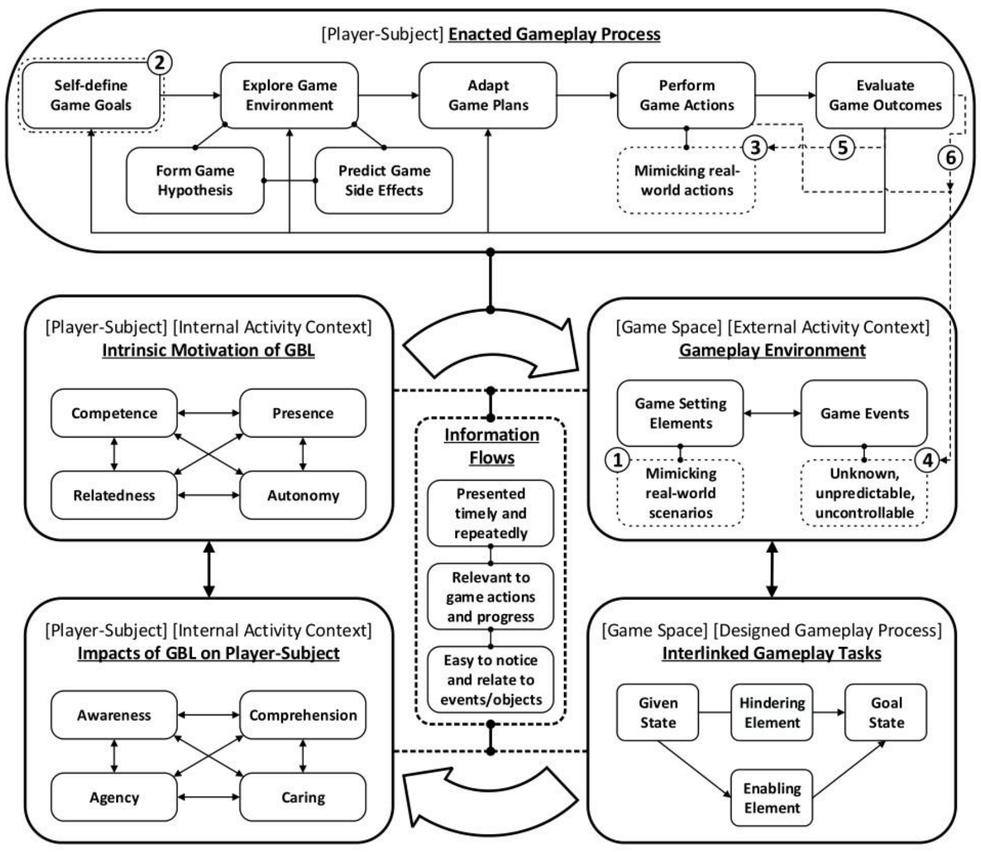
The aim of this thesis is to develop a theoretical framework for the analysis and design of core gameplay features which may function as affordances for promoting key sustainability complex problem-solving game-based learning skills and attitudes.

3. Method

The research aim is achieved through:

- Reviewing available entertainment and serious games frameworks for the analysis and design of gameplay features that may promote simultaneously player enjoyment and complex problem-solving capabilities.
- Modeling core gameplay features, based on reviews and theories, which may function as sustainability complex problem-solving game-based learning affordances.
- Evaluating the proposed gameplay features in existing games and testing their perceived effects on players with a validated analysis instrument.

4. Results



5. Conclusions

The developed and validated analysis instrument for the identification of sustainability complex problem-solving game-based learning affordances in existing games and their perceived effects on players can be a useful tool for game analysts, designers and research in the fields of sustainability, complexity and education.

6. References

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3. Gyaurov, D., Fabricatore, C., & Bottino, A. (2021, September). Development of an Instrument to Analyse Gameplay Features Promoting Complex Problem-Solving Conditions. In ECGBL 2021 15th European Conference on Game-Based Learning (p. 296). Academic Conferences Limited.