

Abstract. The Gamers4Nature project aims to design and operationalize a set of strategies that prepare and encourage an active participation of the youngest audience in game creation, while promoting knowledge about environmental preservation and biodiversity conservation.

In the first phase, a game creation toolkit will be developed, which will include guidelines on the various phases necessary to achieve this goal, as well as resources and tools that may be useful during the process. Besides being foreseen the evaluation and application of this toolkit in a set of secondary schools, by students of different areas, the toolkit will be used by other public, such as university, allowing people with different backgrounds to be involved in the process of creating games.

The project also includes the organization of game jam events with the goal of developing games around the environment and natural conservation issues. In these events, participants will have the opportunity to apply the knowledge derived from contact with the toolkit and, in multidisciplinary teams, create a set of games that reach the target audience, communicate important messages around the preservation of the environment and conservation of biodiversity and with the potential to awaken consciousness and change behaviors.

With this project, it is considered that an important contribution is made to the promotion of the environment and biodiversity, by proposing a set of strategies to create games that can be used by schools, universities, environmental organizations, public bodies, among others, to improve their communication and educational strategies on the importance of preserving the environment. Finally, it is considered that the project's activities also contribute to the development of a set of soft skills in the participants, such as the ability to work in teams and solve problems, as well as creativity, skills that are increasingly valued in society.

Keywords: Mobile games, Game Jams, Game Design Tools and Techniques

Background Information and objectives

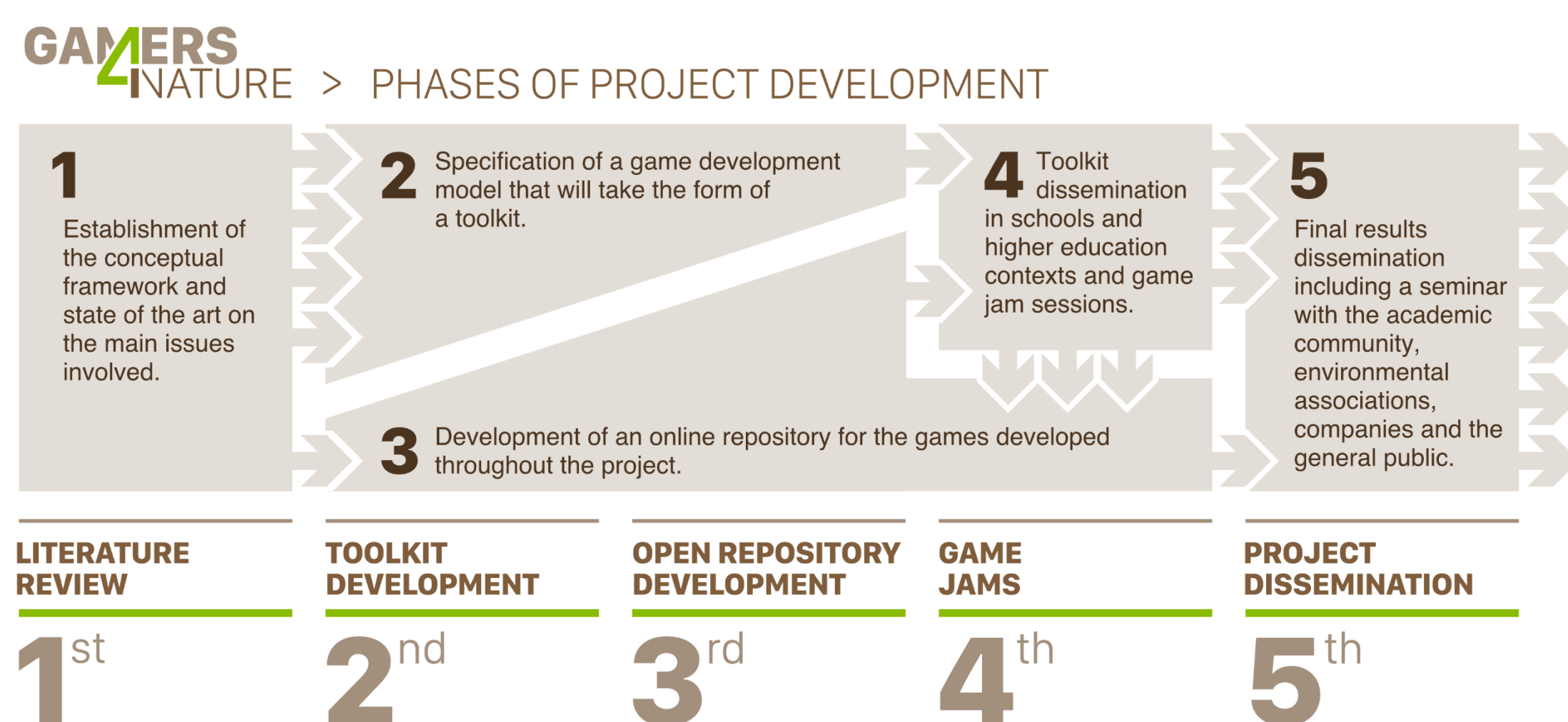
Given the familiarity of a large number of young people with mobile games, these are increasingly being used in contexts other than the merely entertainment context, such as in the educational, professional, advertising, among others. The relevant use of digital games in education has been recognized a few years to this part (Brewer 2003; Earp, Dagnino, and Ott 2014; Gee 2008; McGonigal 2011). Digital games also had proved to be effective in promoting communication about environmental conservation and behaviour change. Against this background, to which are added the growth of the Do-It-Yourself (DIY) culture and several initiatives that aim to broaden participation in the programming area (Coding - the 21st century skill | Digital Single Market 2017), several researchers and practitioners are encouraging users to create their own digital games, which they can subsequently share with the community (Earp, Dagnino, and Ott 2014). This strategy can empower users and offer opportunities for building a range of knowledge and skills not just within specific subject areas, but skills like creativity, problem solving and collaboration, that are part of Twenty-First Century Skills (Earp, Dagnino, and Ott 2014).

The game making can also be undertaken in a collaborative environment, involving people with different backgrounds, which could result in a richer game. One of the strategies to achieve this are game jams. Game jams had been used to help solving scientific problems, expose and overcome sensitive issues and for inclusivity (Kultima 2015; Myerscough et al. 2017). In this way, game jams are often seen as tools for learning different kinds of subject matters and skills (Kultima 2015). One aspect that seems to be lacking is reflection about the importance of a phase of encouraging and preparing people of different skills and backgrounds to participate in these events, with the idea that this could lead to more complete and better games.

The Gamers4Nature project aims to design and operationalize a set of strategies that prepare and encourage an active participation of the youngest audience in game creation, while promoting knowledge about environmental preservation and biodiversity conservation. Being involved in creating games promotes the learning of skills that are necessary to achieve this goal (related to game development tools, programming languages, art styles) but also presents an opportunity to develop knowledge and skills that are not merely technical. In addition, by engaging potential players themselves as creators of games, there is a greater prospect that this message reaches the intended audience and with far greater relevance.

Project activities

The project gamers4Nature will be organized in five stages described in the picture below.



Main results and Contribute

- one book comprising the toolkit to game design strategies;
- a toolkit to game design strategies;
- an open online repository;
- scientific publications;
- a final seminar, enclosing the final project's remarks, involving schools and universities, which will result in a set of recommendations that stimulates investment and innovation practices using technologies;
- thesis (masters and doctoral) developed within the aims of the project;
- a digital repository to securely store and distribute the games.

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References

- Brewer, Carol. 2003. "Computers in the Classroom: How Information Technology Can Improve Conservation Education." *Conservation Biology* 17(3): 657–60. <http://onlinelibrary.wiley.com/doi/10.1046/j.1523-1739.2003.01739.x/full>.
- "Coding - the 21st Century Skill | Digital Single Market." 2017. <https://ec.europa.eu/digital-single-market/en/coding-21st-century-skill> (May 30, 2017).
- Earp, Jeffrey, Francesca Maria Dagnino, and Michela Ott. 2014. "Learning through Game Making: An HCI Perspective." In *Universal Access in Human-Computer Interaction. Universal Access to Information and Knowledge*, eds. Constantine Stephanidis and Margherita Antona. Springer International Publishing, 513–24. http://dx.doi.org/10.1007/978-3-319-07440-5_47.
- Gee, James Paul. 2008. "Learning and Games." *The ecology of games: Connecting youth, games, and learning* 3: 21–40.
- Goddard, William, Richard Byrne, and Florian "Floyd" Mueller. 2014. "Playful Game Jams: Guidelines for Designed Outcomes." In *Proceedings of the 2014 Conference on Interactive Entertainment, IE2014*, New York, NY, USA: ACM, 6:1--6:10. <http://doi.acm.org/10.1145/2677758.2677778>.
- Kultima, Annakaisa. 2015. "Defining Game Jam." In *10th International Conference on the Foundations of Digital Games (FDG 2015)*.
- McGonigal, Jane. 2011. *Reality Is Broken: Why Games Make Us Better and How They Can Change the World*. Penguin.
- Myerscough, Kaelan Doyle, Richard Eberhardt, Mikael Jakobsson, and Claudia Lo. 2017. "Jamming for Allies: Finding a Formula for Inclusive Design Exploration Collaborations." In *Proceedings of the Second International Conference on Game Jams, Hackathons, and Game Creation Events, ICGJ '17*, New York, NY, USA: ACM, 26–32. <http://doi.acm.org/10.1145/3055116.3055121>.
- Sandbrook, Chris, William M Adams, and Bruno Monteferri. 2015. "Digital Games and Biodiversity Conservation." *Conservation Letters* 8(2): 118–24. <http://dx.doi.org/10.1111/conl.12113>.