

Designing game-based educational projects: From COTS in the classroom to playful design and co-creation of games

- **Organisers' background:**
 - **Jorge Oceja:** Jorge is a teacher, Ed. Psychologist, M.A in instructional by California State University (Fulbright Scholarship), and Ph.D. in Education. He has worked extensively in the public and private sectors and he has been the director of the Fundación Botín educational program (the biggest private foundation in Spain). He has taught in Spain, UK, and USA. Currently teaching and researching in the field of Game Studies at Universidad de Cantabria (Spain), he is in charge of *Playing Emotions*, an educational resource that aims to promote social and civic competences through independent video games.
 - **Bárbara de Benito:** Barbara has a degree in Pedagogy and a Ph.D. in Educational Sciences at Universitat de les Illes Balears. She is a professor at the Department of Applied Pedagogy and Educational Psychology where she teaches subjects related to innovation, co-creation, and learning itineraries. She has been involved in the design and development of educational resources, and she has extensive teaching experience both at a national and international level. Investigator in different founded projects. Investigator at *Dali*, an educational project aiming to empower data literacy through playful approaches, co-founded by the European Commission. She has published in the main academic journals in the field of educational technology.
 - **Gemma Tur:** Gemma Tur is a teacher, Master in Elearning and Knowledge Management, and Ph.D. in Educational Technology. She has coordinated several university programs since 2009. She works at Universitat de les Illes Balears where she teaches various subjects both in the Early Childhood and Elementary Education Degree and in the Master Program. Her work focuses on e-portfolios, Personal Learning Environments, and ICTs. She has published extensively in scientific journals and she is Principal Investigator at *Dali*.
- **Length:** 3 hours
- **Estimated number of participants:** 10
- **Selection criteria:** Teachers and educators working at any educational stage (elementary to university), interested in the educational possibilities of games and video games. Also general public interested in the educational field.
- **Objectives.**
 - Understand the different approaches that can be used in educational sciences to design game-based projects based on the main learning theories
 - Design educational projects under sociocultural approaches using COTS in the classroom. Model: *Playing Emotions*
 - Design educational projects under constructionist approaches based on design-based research (DBR) and co-design. Model: *Data Literacy for Citizenship Erasmus+ project (DALI)*
- **Outcomes.** At the end of this workshop, assistants will be able to:
 - Use indie COTS such as *Braid* and *Gris* to promote social and emotional competences
 - Co-create, pilot, and evaluate game-based pedagogical strategies to promote educational key competences such as data literacy
 - Promote game literacy by working with wide audiences (students in secondary education, young adults, general adults, and seniors)

Justification

Since the origins of the game industry, we have seen attempts to explore the educational possibilities of games and video games. Over the last twenty years, various meta-analyses have demonstrated the medium's possibilities for both developing cognitive abilities and improving academic performance. Classic studies by Sitzman (2011) showed that playing video games improved self-efficacy and the acquisition of procedural and conceptual content, rates of data retention were higher, and the ability to transfer learning to other contexts increased. Other authors have indicated benefits linked to spatial abilities (Quiroga et al., 2019) and problem-solving (Hamlen, 2018). If we look at academic disciplines, there are also meta-analyses showing the benefits of games both generally (Martínez et al., 2022) and in specific subjects such as mathematics (Ottar & Hanghøjh, 2020), Language Arts (Beavis, 2014), Social Studies (Oceja et al., 2022), and foreign languages (Rudis & Poštić, 2017).

However, educational efficacy depends on variables such as the specific educational use of games that teachers advocate for. Frequently, teachers have chosen to bring into the classroom games designed with an explicit instructional purpose, which some authors have referred to as *edutainment* (Egenfeldt-Nielsen, 2005). Many times these practices are based on behaviorist rewards where the game is a prize given when knowledge is shown. In a similar line, we have more complex educational games which some authors have referred to as *research-based educational video games* (Egenfeldt-Nielsen et al., 2016). Besides some successes, players perceive these games as different products from those they normally play. Very often their educational intention contaminates the experience, especially when their technical quality is far from what they are used to in commercial releases. If educational games have been traditionally associated with behaviorism and cognitivism, from a constructivist perspective we find another scenario; these stances advocate for using commercial games that allow free interaction with the environment as it happens within sandboxes. Constructionist approaches, championed by Papert (1993) (a pedagogical application of the constructivist theories), would go further, proposing that learners themselves are the ones who should co-create and code their own games. Finally, we find sociocultural approaches (Gee, 2014), which advocate for using commercial games, looking at them as cultural and artistic products around which we can generate meaningful conversations.

In the workshop we review these theories focusing both on the constructionist and the sociocultural approaches illustrating them with two successful educational projects. We first present the development and implementation of *Playing Emotions*, a project aiming to promote social and emotional competences through indie games. The project, developed in cooperation with Universidad de Cantabria and Fundación Botín has helped teachers from different regions in Spain to use games such as *Braid* and *Gris* in educational settings. Then we introduce *DALI*, an educational project co-founded by the European Commission. This project, which aims to empower data literacy for citizens through the co-design of games, will be used as an example of the constructionist approach.

We expect this workshop to help participants to understand the different possibilities that they have for using games in education through practical examples from these two projects.

Activities

Activity I

Theoretical review: Games and Education. A world of possibilities

Duration: 1 hour

Objective: Understand the different approaches that can be used in educational sciences to design game-based projects based on the main learning theories

Activity development: Combining different teaching strategies, participants will review how classic learning theories (behaviorism, cognitivism, constructivism and constructionism, and sociocultural approaches) have conditioned the use of games in education over time. Explanation, debate, and interactive practical activities will be carried out in order to promote a solid psychological foundation before reviewing the practical cases.

Activity II

Understanding *Playing Emotions*, an educational project to promote social and emotional competences through games

Duration: 1 hour

Activity development: Participants will review how *Playing Emotions* was developed and implemented. From the first ideas to the final product, they will see how it helps teachers to improve their game literacy and to implement activities to foster student' social and emotional competences such as self-esteem, empathy, and emotional identification. Those activities are grouped around three moments: Before the game, During the game, and After the Game. We will show how the games were curated (*Braid* and *Gris*) and what recommendations do teachers receive for selecting other games in the future. Then, we will review how teachers in secondary education introduce the designers' work in the learning process, how they implement the suggested activities, and how they can create their own activities.

Activity III

Understanding *Dali*, an educational project to empower data literacy through games, co-founded by the European Commission.

Duration: 1 hour

Activity development: Participants will first understand the peculiarities of *Dali* project, namely how co-designing games and using other playful strategies can help to achieve high-order complex learnings such as those related with data literacy. To do so, we will focus on the process of game co-design between teachers and several audiences such as young adults, adults, and seniors. We will then review and play some of the games designed for the project and we will share tips for effective co-creation. Participants will be invited to create their own games and share ideas for improving the project.

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