

The first scientific role-playing game

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Abstract. We present here an edutainment strategy to communicate science and technology which is strongly based on personal motivation of the learner candidate: participants/players learn because they find it useful/interesting in order to achieve their own goals in some unique game. Our own goal is to capture young people's attention in an immersive and collective storytelling experience within the framework of a role-playing game specifically designed for scientific literacy. The first experiences in public high schools of Argentina are reported here.

Keywords. Role-Playing Games, Edutainment, Scientific Literacy

1. Introduction

A usual choice for the public communication of science and technology (PCST) are popular science talks which success depends not only on how much engaging is the topic for the people attending but also on the ability of the speaker to present such contents. The following informal edutainment (educational entertainment) strategy changes this approach: it is strongly based on personal motivation. In other words, participants/players do not learn because somebody try to engage them with an interesting topic, they learn because they need to in order to achieve their own goals in an immersive and collective storytelling (shared imagination) experience framed within a well-known game format: role-playing games (RPGs for short; Bowman 2018). RPGs are games where the players assume some fictional role in an also fictional setting. Tabletop RPGs (being Dungeons & Dragons the most popular) focus on personal interaction between players who work as a party (or may be not) in some adventure proposed by the game master (GM). The GM is also responsible for all the setting, including the role of all non-player characters. We present here a RPG specifically designed for scientific literacy that offers an informal framework for the PCST by exploring its unique hard sci-fi universe. We also report our results using the aforementioned RPG-based edutainment strategy that had been offered as an extracurricular activity in public high schools of Argentina.

2. A serious game-changer: scientific role-playing games

"Chameleon 792" (the title of our game, 792 for short) is a hard sci-fi tabletop RPG given that: (1) its carefully designed fictional universe is completely built on scientific concepts; (2) it needs face-to-face interaction in order to achieve a more personal experience. Then, it is a serious game that offers the perfect environment to apply our three-steps edutainment strategy: (1-Setting) the GM (world) builds an adventure with the scientific concepts that want the party to become aware of; (2-Mission) the party plays the adventure and finds the concepts previously planted in it by the GM; (3-Discussion) the party and the GM have a brief closure talk about the most appealing scientific content faced by the players during the mission. Then, participants undergo self-paced learning,

and those contents that the party finds most interesting are used by the GM to provoke them intellectually. In conclusion, 792 might be a serious game-changer candidate, being the first title of a new class of RPGs that can be used as tools for scientific literacy and that we have collectively termed as scientific role-playing games (Sci-RPGs for short).

3. The first Sci-RPG: a complete hard sci-fi worldbuilding set

The present open playtest version of the Sci-RPG Chameleon 792 starter book has more than 300 pages to play the 792 right out of the box. It includes a last appendix, "Scientia", where we describe, however briefly, more than 160 scientific concepts from all sciences that were used to build up from the scratch the embryonic version of the 792 hard sci-fi universe. The "Mission Ground Zero: 6EQUJ5" (also included in the starter book) is our first full Sci-RPG mission. It consists of an astronomy-based example that includes all the material to simulate an open-world Sci-RPG experience. 6EQUJ5 extends for more than 25 pages: two self-awareness (human-like intelligence) and four instinctive (non-human-like animals) species are described, an extrasolar binary system composed of nine planets is introduced with two of those planets that are inhabited by the self-awareness species, tokens for three megacities and a space station are also included. Some of the scientific contents planted in the mission are: extrasolar systems and the Solar System, propulsion mechanisms for interplanetary exploration and sustainability.

4. The first Sci-RPG school workshops: a novel edutainment strategy

Based on the 6EQUJ5 mission we organized four workshops on three different public high schools of San Carlos de Bariloche (Argentina) during 2018 and 2019 (due to the COVID-19 outbreak the programmed workshops for 2020 were cancelled). The workshops consisted of 3 to 4 sessions of 2 to 4 hours each and for groups of 5 students (girls and boys). We show here a few answers collected in an anonymous poll as part of the positive and encouraging feedback received from the participants, notice that motivation was key to foster their curiosity about astronomy related content:

(1) *Yes, I would recommend the game because one can have fun while solving situations that the mission forces you to face, and not only using the laws of physics but also breaking them.* (2) *Yes, totally help me to socialize.* (3) *Time flies because the game is so interesting.* (4) *I would kept playing more sessions if I could.* (5) *Yes! It would have been awesome to explore further the fictional world.* (6) *Actually, I did not expect a game like this. The idea is very original.* (7) *I had the feeling while we were playing that the story changed with our decisions and actions.* (8) *After the sessions I started to be curious about black holes.* (9) *I would like to learn more about the planets.* (10) *I want to know more about astronomy, dark matter, time and space and the different dimensions.*

5. Final remarks

The 792 starter book in spanish and an english sneak peek version are freely available [here](#) and [here](#), respectively. In 2021 we will present the 792 in a dedicated web site.

References

Bowman, S. 2018, in: J.P. Zaga & S. Deterding (eds.), *Immersion and Shared Imagination in Role-Playing Games* (Role-Playing Game Studies: Transmedia Foundations. New York: Routledge), p. 379-394