Chapter 19
Chemistry Edutainment:
A Storytelling Activity for Middle-School Children

José Ferraz-Caetano

https://orcid.org/0000-0001-7226-8995

REQUIMTE-LAQV, Faculty of Sciences, University of Porto, Portugal

Dora Dias

https://orcid.org/0000-0001-7564-5493

Unidade de Ensino das Ciências, Faculty of Sciences, University of Porto, Portugal

ABSTRACT

Creating a fun, interactive, and useful science activity for teaching purposes can be a real challenge, especially if it is addressed to middle-school children. More and more science communicators are employing novel communication techniques to better reach out to their audience. In science communication, storytelling is valuable to sparking interest in science. Given that there are many episodes in the history of science that can serve as inspiration, the authors of this chapter share how they used storytelling, based on a real-life event, to create a science communication activity for middle-school children. Focused on chemistry and ethics, these topics were introduced through hands-on laboratory activities with ethical questions embedded in the story line. This task challenges the students to come up with answers by themselves, through a problem-based learning model. By adding game logic elements to this activity, the authors created a unique form of communicating science, both educational and entertaining, which children appreciated.

INTRODUCTION

In this chapter, the authors will discuss in detail how they transformed an event from the history of science in the 19th-century, known as the "Crime on Flores Street", into a storytelling-based activity focused on chemistry and ethics, thus calling it "Ethics against Chemistry". This chapter emphasizes the potential

use of storytelling in science education, presenting a framework of a new science communication activity, which was well-received by the students.

"Ethics against Chemistry" was designed for middle-school students, to be used in a non-formal classroom environment. Moving through the sections of this chapter, we will explore all stages of storytelling development, including the adaptation of the real story into a student-friendly activity, as well as the association of storytelling with gamification. Following the introduction of the concepts of storytelling and edutainment, section two of this chapter presents the activity outline, addressing the general aspects of its framework. The primary focus will be on structuring the activity whilst addressing our proposed goals for student interaction. In the following section we present in detail our activity framework. Firstly, a review of "Crime on Flores Street" is presented, to explain key aspects retained in the activity design. Then, the focus will turn to the storytelling adaptation of this case, detailing key aspects such as its history, characters, and student engagement. The section ends with a clear-cut explanation of how the gamification elements were added to the activity, highlighting the connections made with the edutainment and storytelling framework. The addition of game logic elements has turned this activity into a form of entertainment without neglecting the educational side, thus creating a unique form of chemistry and ethics "edutainment". The next section of this chapter contains the assessment of the activity. We will focus on the feedback given on the activity, specifically in its storytelling and edutainment components. This part of our research aims to analyze the suitability of this approach from the students' perspective. In the final section we discuss the challenges and possible research opportunities created by this work.

Previous results of this activity were presented in the following conferences: XVII ENEC / III International Seminar of Science Education in Porto (Portugal) and *Encontro de Ensino e Divulgação da Química* in Coimbra (Portugal), both in 2019.

BACKGROUND

Edutainment

Edutainment is a challenging learning methodology that tackles many problems of traditional forms of education. The student is the focal point of the learning activity, making edutainment a dynamic part of the educational process. Students can express their preferences based on their experience and learning interactions. Teachers, on the other hand, can use this information to improve their outputs (Johnson, 2010, p. 55; Zhigeng, 2019). Learning new skills while gathering experience and feeling emotions while being entertained is pivotal for this educational method (Donovan, 2010, p. 138). Edutainment positions itself as an entertaining mechanism that can provide knowledge to many people, while being aesthetically appealing (Buckingham, 2005, p. 41). But the key factor of this methodology is the informal approach of the lessons. As such, extensive or highly dense subjects are treated in a way that is more appealing to the audience (De Vary, 2008, p. 35; Sorathia, 2010, p. 265). Broadly speaking, edutainment comes as an amalgamation of the concepts of 'education' and 'entertainment'. "Learning from entertainment" requires an establishment of gamification practices to renew traditional forms of education. In other words, it tackles the students' lack of focus and interest (often cited as one of the major issues in traditional learning methodology) by providing them with opportunities to create a positive learning experience (Zin, 2010).

Current research on edutainment methodologies usually presents two routes of educational strategies: the use of entertaining elements or the integration of educational content into an entertainment sphere.

26 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/chemistry-edutainment/267607

Related Content

Leveraging Artificial Intelligence for Digital Actionable Transformation of Business: Strategies for Integrating Intelligent Technologies
Zuber Peermohammed Shaikh (2025). *Business Transformation in the Era of Digital Disruption (pp. 181-212).*
www.irma-international.org/chapter/leveraging-artificial-intelligence-for-digital-actionable-transformation-of-business/357685

A Dynamic Resource Provisioning VNE Algorithm Based on Graph Theory
Isha Pathak, Deo Prakash Vidyarthiand Atul Tripathi (2018). *Advances in Data Communications and Networking for Digital Business Transformation (pp. 73-97).*
www.irma-international.org/chapter/a-dynamic-resource-provisioning-vne-algorithm-based-on-graph-theory/205224

Looking Back and Looking Forward: Journalism's Contrasting Two Futures
Anat Balint (2022). *Redefining Journalism in an Age of Technological Advancements, Changing Demographics, and Social Issues (pp. 115-126).*
www.irma-international.org/chapter/looking-back-and-looking-forward/299607

Exploring the Effectiveness of Storytelling in Advertising Through Eye-Tracking
Luis-Alberto Casado-Aranda, Juan Sánchez-Fernándezand Arminda Paço (2021). *Handbook of Research on Contemporary Storytelling Methods Across New Media and Disciplines (pp. 158-179).*
www.irma-international.org/chapter/exploring-the-effectiveness-of-storytelling-in-advertising-through-eye-tracking/267594

Citizen Journalism: News Gathering by Amateurs
Rabia Noor (2017). *Handbook of Research on Citizen Engagement and Public Participation in the Era of New Media (pp. 194-229).*
www.irma-international.org/chapter/citizen-journalism/172233