11th International Conference of the Immersive Learning Research Network
Selected Academic papers for the iLRN Proceedings

DOI: https://doi.org/10.56198/1q2c7b59

Extended Abstract—Stories of Peso da Régua: The Enigma of the Ancient Vines - The Co-Creation Process of an Immersive Experience in Cibricity

Eliane Schlemmer[1], Maria van Zeller[2], Diana Quitéria Sousa[3] and Patrícia Scherer Bassani[4]

[1] Unisinos, São Leopoldo, Brazil
[2] INESC TEC, Porto, Portugal
[3] Universidade do Porto, Porto, Portugal
[4] Feevale University, Novo Hamburgo, Brazil
elianes@unisinos.br
maria.v.zeller@inesctec.pt
diana.q.sousa@inesctec.pt
patriciab@feevale.br

Abstract. The processes of digitization and connectivity have transformed society, cities, and consequently, the spaces and ways of living, working, producing, and socializing knowledge, as well as teaching and learning. Geographically located spaces are expanded and enhanced in the digital realm, providing a way of being that is no longer solely physical-geographic but also digital across different platforms. This study aims to present the process of ideation and co-creation of an immersive experience in cybercity developed in the context of an international event that occurs in a hybrid format, articulating actions in a physical space – the city of Peso da Régua, Portugal – and in digital spaces. The immersive experience hybridizes physically located and co-created spaces in the Metaverse Spatial, involving co-authorship with Generative Artificial Intelligences. It also articulates immersion, hybridism, and cybercity concepts through a gamified narrative. Historical and fictional characters guide the experience through missions and challenges, which involve geographical clues (spaces of the city), live clues (people from the community), analog clues (cards), and digital clues (such as QRCodes and puzzles). The research employs the Cartographic Method of Research-Intervention rECOnectivo. As results, the article points to clues that can inspire pedagogical practices that integrate cybercity as a new way of teaching and learning in this third millennium.

Keywords: Immersive Experience, Cibricity, Hybridism, Gamification, Inventive Pedagogical Practice, Co-Creation, Co-Design, Immersive Educational Escape Room, Location Based Game.

1 Introduction

The ways we live, teach, learn, work, communicate, and experience daily life nowadays, are no longer confined to traditional physical spaces, geographically located in cities, schools, or different institutions. These activities now are spread into digital spaces across various websites, apps, and networked platforms. The emergence of Generative Artificial Intelligence (GAI) includes also non-humans agents in the scenario. In this context, virtual, augmented, immersive, and hybrid realities emerge, combining physical and digital experiences. These new realities foster new ways of living and coexisting, challenging people and institutions to reinvent themselves.

This leads us to reflect upon the urgency of a more connected and hybridized education based on competencies to inhabit this third millennium. According to the report of the International Commission on the Future of Education [1] “classrooms and schools are essential, but in the future they will need to be built and experienced differently”. This study aims to contribute to booster new practices in educational settings presenting the process of ideation and co-creation of an immersive experience in cibricity.

Immersion was investigated by Murray [2], who defines it as the sensation of being transported to a simulated environment where the user feels completely involved and engaged in the experience. Schlemmer et al [3] states that “immersion is the sensation that makes us feel part of a certain environment, as if we were ‘inside’, ‘immersed’, ‘inserted’ in that universe, this being the feeling of belonging to a reality.” (p. 958).

Cibricity is a term brought by Ribeiro [4] and is understood as the product of the connection between the physical-urban space and cyberspace. Schlemmer [5] refers that cibricity is this city, which from the physical-geographic space, through digitality and connectivity, expands to the digital network, configuring itself as a hybrid city. This hybrid city results from geographic spaces that connect, extend, amplify, and potentiate each other in other digital, informational, and connective graphics, which are managed by different technologies, applications, and digital platforms. These spaces involve humans, biodiversity, technique, information, languages, and territories in the constitution of a network ecology. Cibricity, according to Schlemmer [6], is constituted in the co-engineering of the following dimensions: physical-geographic, digital, informational, interactive, pervasive, and ubiquitous.

Thus, in the context of this study, an immersive experience articulates a sense of involvement and belonging in the space-network, which is constituted in the articulation between physical and digital experiences between human and non-human agents.

The paper is organized as follows: first, in section 2, we present the methodology based in co-creation; in section 3, the literature review and theoretical intermediaries and in section 4, a case study with an immersive experience in cibricity: results and analysis and in section 4, the conclusions.

2 Methodology

The research employs the "rECOnective Cartographic Research-Intervention Method" [7] which views knowledge as the product of an ecology connecting humans and non-humans. The method integrates elements from the Cartographic Research-Intervention Method [8, 9], Living Labs [10], and networked research contexts[11].

The method refers to researching within and through networks, constituted by the connectivity between humans and non-humans, and which produces (from the perspective of co-creation) data throughout the process in a research context that is also an intervention. This is significantly different from other methodological approaches developed from a frontal perspective of the externality and objectivity of the human observer who collects data from a context external to them.

From the perspective of the rECOnective Cartographic Research-Intervention Method, the problem that gives rise to the research emerges from the problematizations that the researcher-cartographer, in connection with technologies and digital platforms, carries out when inhabiting a specific connected context, which is configured as an existential territory.

In the context of this research, the problem emerged when inhabiting the organizational meetings of the V International Congress of RIEOnLIFE and the IX International Festival We, Learning with Cibricity: how to provide an immersive experience for attendees (both physically and online) in the city of Peso da Régua (which hosts the events)?

The congress is organized by an international committee including Brazilian and Portuguese researchers, and aims to establish a common space-time for coexistence, conversations and sharing between teachers and researchers focusing on education in contemporary times based in the OnLIFE Education Paradigm.

The immersive experience should promote the learning about cultural and historical aspects of the city of Peso da Régua and establish relationships with Brazil in order to provide students and teachers with an inventive educational experience. In this sense, a sub-committee of the event was formed, entitled Immersive Experience in Cibricity (in Portuguese, Vivência Imersiva na Cibricidade or VIC), composed with ten participants with interdisciplinary training, including researchers from Brazil and Portugal, doctoral candidates, master's students, and undergraduate students from Brazil and residents of the Municipality of Peso da Régua (Portugal) and Bento Gonçalves (Brazil).

The cartographic research was conduct throughout three territories: a) Literature review; b) Theoretical intermediaries; c) Process of the VIC co-creation (device to be analyzed, the entire process of ideas, discussions, tensions, and development that constituted the journey) that gave rise to the VIC was mapped, recorded, and documented in text, audio, images, and video. Data generated were analyzed using insights from the first two territories.

3 Literature Review and Theoretical Intermediaries

From the perspective of the rECOnective method, the literature review configures the first territory of the research. It allows the researcher-cartographer to be aware of the existing scientific production focusing on the area of the investigation to be able to identify possible gaps where the development of the research can contribute.

We started the literature review with a search for the strings “immersive experience”, “technology”, “hybrid” and “city” and their Portuguese equivalents in Google Scholar, considering open access articles published in the last three years (2022-2024). From the set of articles selected through keywords, we highlight studies that address the hybrid relationship between the physical and the digital from different perspectives, seeking to identify immersive experiences exploring the hybrid context and the technologies used to articulate these different spaces. Virtual reality technologies centralize a large part of the set of articles found. However, for the context of our proposal, we focus on experiences that explore the hybridization between physical and digital presences in the context of mobility.

Lima et al. [12] developed a gamified narrative exploring the city as an immersive learning territory, involving the articulation between physical and digital presence, starting from a WhatsApp group. The participants were immersed in a hybrid presence, combining physical displacement through the city. The different clues received through the application, in addition to solving challenges, guided the participants. The immersive experience proposed by Oliveira et al. [13] started from a Facebook group and was developed entirely online. The proposal involves a gamified narrative articulating different web applications and exploring Google Maps as a space for habitation and co-creation. Menezes and Schlemmer [14] explored Google Earth as a geolocation technology to propose an immersive experience involving the hybridization of the biological, physical, and digital worlds. Videos captured by teachers, recording the movement of the fauna and flora of a municipal park, were made available to students.

From the literature review, we highlight the following clues:

a) immersion can happen at different levels, involving from navigation in predefined territories to the co-creation of the shared space;

b) the analyzed experiences use a single digital environment as a reference for conducting the narrative;

c) geolocated proposals allow exploring the territory as a physical space and a data space;

d) in the gamified narratives analyzed, the group always receives clues from external entities, who are involved in the context but are not impacted by the experience.

The clues reveal a possible path still open: How to propose an experience that is co-created from the exchanges between the subjects involved, exploring simultaneously two paths and different types of presence?

Based on the clues found in the literature review, we sought some theoretical intermediaries that could contribute to a better understanding of the VIC co-creation process (second territory of research).

Thus, in the context of this study, an immersive experience articulates a sense of involvement and belonging in the space-network, which is constituted in the articulation between physical and digital experiences between human and non-human agents.

Co-design practices have been transforming the landscape of design research by introducing new domains of collective creativity. This movement, described as a significant evolution in design practice, enables the involvement of multiple perspectives in solution development [15]. In this study, a co-creative approach is adopted for the design of XR digital content, fostering facilitation and the expansion of interdisciplinary collaboration. The effectiveness of this approach is particularly evident in cross-pollinating knowledge transfer, a process widely documented in the literature [16–18]. Furthermore, the co-creative approach allows for a deeper investigation into stakeholders' true needs, encouraging the design of immersive and meaningful. As a result, the evolution of design toward co-creation practices expands interdisciplinary impact and contributes to more collaborative and innovative solutions. The use of AI tools in the discussion and ideation process was essential for exploring concepts and cultural understandings. This process enabled faster prototyping and decision-making through the collaboration of the entire team.

The concepts of immersion, immersive experience, and cibricity support the co-creation process of the VIC, which configures the device of the research, thus composing the third territory of the research and is presented next.

4 Immersive Experience in Cibricity: Results and Analysis

This article focuses on the data produced for the VIC device called “Stories of Peso da Régua: The Enigma of the Old Vines”. To organize the sub-committee's work, a Discord server and a Google Drive folder were created. Since April 2024, weekly synchronous meetings on Discord and numerous asynchronous interactions have been held to develop and co-create the VIC.

The analysis focuses on the VIC production process, drawing on clues found in the first and second territories that underpin the research.

The clues revealed by the journey through the research territories guided the proposal of the VIC as an immersive experience Thus, the VIC aims to:

- Explore the potential of gamification to create a geolocated fictional narrative through playful challenges, exploring different realities.
- Foster co-creation through exchanges between the involved subjects, simultaneously exploring two paths and different types of presence involving human and non-human agents.

Initially, the sub-committee focused on the conditions (spatial, technological, and audience) necessary to conceive the VIC, as well as a method to guide its creation and define its characteristics, considering the emerging features of the previous territories.

4.1 From the Perspective of Gamification and Geolocation

At that time, it was determined that the VIC would be characterized as a Contextual Hybrid Escape Game (CHEG) [6] connecting physically located geographic spaces and digital spaces. With involving movement in both physical and digital spaces and elements sensitive to the context of cibricity, it is also configured as a Mobile Ubiquitous Pervasive Extended Reality Game (MUP-ERGs) [19].

The development method for the VIC was guided by the inventive VersOnLIFE methodology[1] [7], supported by the Gamification Framework and Immersive Educational Escape Rooms based on research conducted recently on the field [20–23].

4.2 From the Perspective of Co-Creation of the Route

In the VIC, physical spaces in Peso da Régua were hybridized with different immersive digital spaces and Generative AIs to form ecologically connected and gamified contexts.

The experience consists of a narrative with two interrelated routes through different challenges. The physical face-to-face route explores the territory of the city of Peso da Régua. Participants start from the Douro Museum on a mission to explore the city, immersed in the proposed fictional narrative. The digital face-to-face route starts from the metaverse developed through the Spatial environment and is complemented by an Escape Room conducted on Genially.

The narrative is composed of eight missions distributed across eight points of interest (POI):

(1) Douro Museum, where the goal is to uncover the GPS coordinates of four locations indicated in a mysterious letter accompanied by respective postcards (Big Ben, London, UK; Eiffel Tower, Paris, France; Colosseum, Rome, Italy; Christ the Redeemer, Rio de Janeiro, Brazil);

(2) Water Fountain, where the mystery of the vines is associated, suggesting that the solution to the puzzle is linked to the ancestral knowledge of viticulture;

(3) Régua Pier, where participants are immersed in the rich culture and history of Régua sweets, with the opportunity to interact with the "Rebuçadeiras" and uncover the secrets behind this delicacy;

(4) Interactive Tourism Shop of Peso da Régua, a modern and technological space where participants can explore various tourist attractions of the region;

(5) João Araújo Correia Statue, where there is a puzzle to be revealed about his literary work;

(6) Library, where participants are invited to search for historical technical information on grape cultivation and pest control;

(7) Peso da Régua City Hall, where participants learn to recognize the city's coat of arms and its elements;

(8) Peso da Régua Municipal Auditorium, where participants gather for the game's conclusion. They must show all the collected items to exchange for the final reward.

The narrative has a personalized virtual assistant, "U.V.A." (Ancestral Verification Unit). U.V.A. is an avatar personified as an animated and stylized grape that "knows everything" about Peso da Régua, accompanies participants throughout the game, and facilitates the completion of challenges by providing tips and information along the educational escape room route.

Each POI has an entity associated with the game narrative. In addition to an entity, each POI, after completing the mission, has a reward accompanied by a badge symbolized with a star that is incremented for each mission surpassed.

Regarding the game mechanics, the Genially Escape Room uses many interactive objects for only the first seven game missions: (1) decipher GPS coordinates; (2) solve a puzzle; (3) group classification; (4) multiple-

[1] "Verse" from the Metaverso and OnLIFE Education framework. This methodology blends diverse spaces (geographical and digital), technologies (analog and digital), presences (physical and digital), and languages (human and AI-generated), integrating the two primary metaverses approaches [25]. It incorporates elements from the adapted cartographic research-intervention method as a pedagogical practice [26] and gamification elements focused on empowerment [27].

choice questionnaire; (5) missing words; (6) fill in the blanks; (7) connecting dots, depending on objects with different shapes and colors (considering accessibility for people with visual impairments).

The physical experience has interlocutors present on-site, such as actors and characters who leave audio messages. The actors include the Marquês do Pombal and a woman who sells traditional sweets from Régua called "rebucadeiras"; this lady sells sweets daily on the streets of Régua. Other characters, like Barão de Forrester, leave a physical letter on-site, and Ferreirinha leaves an audio message, Miguel Torga leaves a message presented and read on-site. João de Araújo Correia is present in his local statue, and UVA acts as an agent that operates only digitally.

The 20-minute route through the streets of Peso da Régua has eight mission points, with various activities in the form of missions that are assisted by students in Bento Gonçalves. At the last mission point, the "key" is found, and the VIC ends. Throughout the entire route, communication will be prioritized, and at the end, the whole group will meet on a digital "mural", where they will leave a message about the VIC.

This VIC was carried out by the whole team, taking into account the different backgrounds that made valuable contributions to the process of creating and developing the VIC. The use of Generative AIs supported the entire process of creating the characters, based on documentation provided by the Portuguese team and then generated by the Brazilian team. The negotiation and discussion on this subject were very proficient, and the results were very satisfactory and effective. The use of narration tools made it possible to generate different voices quickly and the team was able to negotiate this point.

5 Final Considerations

This co-design process involved collective activities spanning the duration of the design processes. "Co-creation" is widely referred to as "collective creativity, i.e. creativity shared by two or more people" or even as suggested in the article as involving generative agents with AI. To narrow down the implications even further, the authors emphasized the term "co-creation" to describe collective activities that span the duration of design processes. These phases of design thinking methodology were: (1) Problem understanding (team engagement, online site exploration and introduction of the technology), (2) Design and analysis (Brainstorming of ideas and space route), (3) Developed and implement (design with content: narrative, characters creation; Prototyping with no-code software and implementation of game mechanics), (4) Evaluating Acceptance (Testing virtual and local with the team), (5) Verify (Deployment with immersive platforms locally and analysis of the results). The results of the different phases were achieved through weekly online sessions, the development of the solution was carried out remotely and discussed online, and the tests were carried out online and on site. In the end, it was possible to evaluate the co-design process and the VIC experience and identify co-creation processes with AI agents for new projects, particularly in the creation of characters and narrations. This methodological model, used to guide the design of games with AR experiences for museum designers and professionals, is in line with Maria van Zeller's 'Play the Museum' framework, applied in an online context [24].

The development of the co-creation experience was successfully carried out. For this, it was necessary to consider cultural factors in the methodological process, such as terminology issues. We always kept in mind that finding a consensus would be more interesting, but the particularities that define us enrich the cultures of the two cities. In this sense, there was a principle present throughout the entire process of ideation and development of the experience, which was based on the acceptance of cultural diversity and an attempt to find common points in each culture. Thus, the characters that guided us through the story are local reference figures from Peso da Régua in various domains, such as literature, viticulture, gastronomy, and politics. These characters, who present the challenges throughout the experience, are virtual and physical interlocutors that bring humanization, but are accompanied by a virtual character that links the two experiences.

The narrative created by the team had a fictional and historical basis, with gamified activities, called missions, that will allow Brazilian students to be "agents" supporting Portuguese students in solving puzzles and advancing in the experience. This support involves researching information online, solving logical challenges, and communicating with the students on-site.

At the end of each mission, the rewards are for both "teams," rewarding the success of all and inter-city communication. The VIC allows for the enhancement of each individual's knowledge, as well as the group's action. These objectives were taken into account in the ideation meetings, as well as in the implementation meetings.

The design meetings of the experience were moments of cultural and scientific interaction, as well as the transfer of knowledge and practices in designing geo-located gamified experiences. The performance of a multidisciplinary team co-creating the experience was an interdisciplinary cultural experience of scientific excellence.

Acknowledgements

This article is financed by National Funds through the Portuguese funding agency, FCT - Fundação para a Ciência e a Tecnologia, within project UIDB/50014/2020 (DOI 10.54499/UIDB/50014/2020).

References

1. UNESCO: Reimagining our futures together: a new social contract for education. UNESCO (2021).
2. Murray, J.H.: Hamlet on the Holodeck: The Future of Narrative in Cyberspace. Instituto Itaú Cultural, São Paulo, Brazil (2003).
3. Schlemmer, E., Lopes, D.Q., Marson, F., Carolei, P., Thomazzoni, E.S.: SBGames K&T: o rastreio, o toque, o pouso e o reconhecimento atento. In: SBC – Proceedings of SBGames, XIV SBGames. pp. 955–961. SBGames, Teresina, PI – Brazil (2015).
4. Ribeiro, S.E.: A cidade como rede conectiva de educação cidadã., http://www.repositorio.jesuita.org.br/handle/UNISINOS/9368, (2020).
5. Schlemmer, E.: A vida está ON, https://educatrix.moderna.com.br/a-vida-esta-on/?fbclid=IwAR2e_68FkTq1h27NNxvjsfkpjj3viI9OGjBYlNM_Fvmd4Lre5n0-VtwBnwY, (2021).
6. Schlemmer, E.: A 'cibricidade' como espaço de ensino e de aprendizagem, https://pp.nexojornal.com.br/ponto-de-vista/2022/11/08/a-cibricidade-como-espaco-de-ensino-e-de-aprendizagem, (2022).
7. Schlemmer, E.: Metaversos e novos mundos numa ecologia de inteligências: o habitar da cidadania digital na educação OnLIFE. In: Magalhães, M., Di Felice, M., and Franco, T.C. (eds.) Cidadania digital: A conexão de todas as coisas. pp. 317–342. Alameda Casa Editorial, Lisboa/São Paulo (2023).
8. Passos, E., Kastrup, V., Tedesco, S. eds: Pistas do método da cartografia: A experiência da pesquisa e o plano comum. Sulina (2016).
9. Passos, E., Kastrup, V., Escóssia, L. da eds: Pistas do Método da Cartografia: Pesquisa-intervenção e produção de subjetividade. Sulina (2017).
10. Mitchell, W.J.: Me++: The Cyborg Self and the Networked City. Mit Press, Cambridge, Massachusetts, USA (2003).
11. Di Felice, M.: Redes sociais digitais, epistemologias reticulares e a crise do antropomorfismo social. Revista USP. 0, 6 (2012). https://doi.org/10.11606/issn.2316-9036.v0i92p6-19
12. Lima, C.C. de, Oliveira, L.C. de, Schlemmer, E.: Prática pedagógica gamificada na configuração de um território imersivo de aprendizagem. APEduC. 4, 106–122 (2023).
13. Oliveira, L.C. de, de Andrade, F., Schlemmer, E.: EDUCAÇÃO ONLIFE E TRANSFORMAÇÃO DIGITAL: a prática pedagógica inventiva "Novas Aventuras de Dom Quixote." Video Journal of Social and Human Research. 1, 37–56 (2022). https://doi.org/10.18817/vjshr.v1i2.25
14. Menezes, J., Schlemmer, E., Hohendorff, R.: Discoveries at parcão – a cibricidade como potência para o desenvolvimento do pensamento computacional na educação OnLIFE. Presented at the January 1 (2022).
15. Sanders, E.B.-N., Stappers, P.J.: Co-creation and the new landscapes of design. CoDesign. 4, 5–18 (2008). https://doi.org/10.1080/15710880701875068
16. Ranjan, K.R., Read, S.: Value co-creation: concept and measurement. J Acad Mark Sci. 44, 290–315 (2016). https://doi.org/10.1007/s11747-014-0397-2
17. Trischler, J., Pervan, S.J., Kelly, S.J., Scott, D.R.: The Value of Codesign. J Serv Res. 21, 75–100 (2018). https://doi.org/10.1177/1094670517714060
18. Suhari, M., Dressel, M., Schuck-Zöller, S.: Challenges and best-practices of co-creation: A qualitative interview study in the field of climate services. Clim Serv. 25, 100282 (2022). https://doi.org/10.1016/j.cliser.2021.100282
19. Schlemmer, E.: Metodologias Inventivas na Educação Híbrida e OnLIFE. In: Educação digital, a distância e em rede. pp. 124–150. Universidade Aberta / Imprensa da Universidade de Coimbra (2022).
20. Sousa, D., Coelho, A., Torres, M.: Educational escape rooms activities to facilitate learning strategies and improve teaching, learning, and assessment processes. In: EDULEARN22 Proceedings. pp. 2534–2539. 14th International Conference on Education and New Learning Technologies, Palma, Spain (2022).
21. Sousa, D., Coelho, A., Torres, M., Garcia, A., Paula Pinto, T.: Adaptability and Procedural Content Generation for Educational Escape Rooms. In: Costa, C. (ed.). Proceedings of the 16th European Conference on Games Based Learning, ECGBL 2022. pp. 766–773. Dechema e.V., Lisboa, Portugal (2022).
22. Fotaris, P., Mastoras, T.: Room2Educ8: A Framework for Creating Educational Escape Rooms Based on Design Thinking Principles. Educ Sci (Basel). 12, 768 (2022). https://doi.org/10.3390/educsci12110768
23. Fotaris, P., Mastoras, T.: Room2Educ8: A Conceptual Framework for Designing Educational Escape Rooms. In: Costa, C. (ed.) Proceedings of the 16th European Conference on Games Based Learning, ECGBL 2022. pp. 693–701. PublisherDechema e.V., Lisbon, Portugal (2022).
24. van Zeller, Maria.: Jogos com realidade aumentada nos Museus. Caleidoscópio, Lisboa (2023).
25. Di Felice, M., Schlemmer, E.: Ecologias dos Metaversos e Formas Comunicativas do Habitar, uma Oportunidade para Repensar a Educação. Revista e-Curriculum. 20, 1799–1825 (2022). https://doi.org/10.23925/1809-3876.2022v20i4p1799-1825

26. Schlemmer, E.: Tecnologia-conceito ECODI: uma perspectiva de inovação para as práticas pedagógicas e a formação universitária. In: VII Congresso Iberoamericano de Docência Universitária. Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto, Porto, Portugal (2012).
27. Schlemmer, E.: Games e Gamificação: uma alternativa aos modelos de EaD. RIED. Revista Iberoamericana de Educación a Distancia. 19, 107 (2016). https://doi.org/10.5944/ried.19.2.15731