Playing, Discovering, and Learning in Corfu Old Town

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Abstract. Sustainable development of the world's cultural heritage heavily relies on the acquisition of knowledge about its values and ethics. United Nations' 4th Sustainable Development Goal refers to ensuring inclusive education and promoting equal opportunities for lifelong learning for all. Sustainable development through education requires the design, development, implementation and validation of sustainability competencies to contribute to the monitoring of initiatives in the field. Considering the above, the purpose of this chapter is to underline the significance of educational documentation in preserving and promoting cultural heritage using a gamification approach, based on established learning theories derived from the field of educational psychology, including but not limited to behaviorism, constructivism, social constructivism, activity theory, and discovery learning. More specifically the chapter introduces the design of a game named "Discover Corfu old town" (DisCot), which integrates certain United Nations' SDGs. The game refers to the exploration of the Old Town of Corfu, a multicultural World Heritage Cultural Monument and encourages the protection of shared heritage, fostering intercultural dialogue between the players. The gameplay and the ideas behind the design are being presented, emphasising on the diversity understanding, mutual comprehension of the different aspects of the monument's history as well as inclusiveness, all of which can enhance the societal needs for peace and prosperity, which are the basic goals of United Nation's Agenda 2030.

Keywords: Cultural heritage management · Educational Theories · Educational Psychology · Gamification · Sustainability

1 Human Participation - Cultural Heritage - Inclusive Societies

Human participation in the modern knowledge society presupposes the recognition of the value of the past and the consideration of cultural heritage as a fundamental foundation of our identity [1]. The utilization of technologies and multimedia content in the dissemination, communication, promotion and learning of cultural heritage has begun for years to acquire the necessary momentum, at least at a research level. The use of modern and combined media improves the way humans experience and perceive culture [2] and transforms the way history is perceived through research data exchange [3]. The digitisation of cultural elements causes both pleasure for the public and usability for

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heritage experts [4]. Visitors of a cultural heritage site create expectations for the enjoyment and knowledge they will acquire during an on-site visit [5]. In addition, the use of new technologies allows the presentation of cultural heritage focusing on the users themselves and their personal needs [6]. Cultural learning is enhanced through methods of interaction with collaborative features, which can be a practical approach to digital cultural heritage applications and enhance the social dimension in the experience created [7]. Nowadays, the learning process is being intertwined with the use of new technological tools, which are widely used in the tourism and cultural industry and which have been used by all learners, students and non-students. The visitor of a destination also acts as an apprentice [8, 9] as the knowledge acquired expands with the use of technology, creating greater connectivity and personal relationship with the destination visited.

In the same direction, museums are immensely related to education and heritage preservation. They serve as custodians of cultural heritage, preserving art and historical records that reflect local identities and societal development. In addition, they offer unique experiences that go beyond the traditional classroom. New technological tools that used to promote artifacts, interactively engage visitors and promote experiential learning and critical thinking. In the framework of museum education, the organization of educational programs foster deep communication and understanding of different cultures, traditions, and values between the visitors. Museum education makes cultural heritage accessible to audiences and activates individuals to participate in a self-interpreting procedure of heritage, ensuring cultural continuity and inclusion.

Inclusion is not just about disability, nor is it just about education. Inclusion is about social justice and equal opportunities. At the same time, education is not the end in itself but the means of contributing to the realization of an inclusive society with human rights to be the compass of policy making. Inclusive education is the broadest concept that encompasses all efforts to reduce exclusion from school programs, culture and community. Therefore, the issue is about equality, free access, social justice and the struggle for a society without discrimination. These principles must be at the heart of all policies and practices for sustainable development as underlined by United Nation's Agenda 2030.

1.1 Quality Education and Sustainable Cities and Communities

The United Nations Sustainable Development Goals (SDGs) cover a comprehensive set of 17 goals designed to pave the way towards a sustainable future for all individuals and the planet [10]. Among these goals, the 4th and 11th SDGs specifically target inclusive societies and inclusive education as crucial pillars for achieving sustainable development worldwide. Inclusive societies are characterized by a deep appreciation for diversity and the promotion of equal opportunities for individuals, irrespective of their background, identity, or circumstances. Inclusive education stands as a vital component of fostering inclusive societies. It embraces an educational approach that acknowledges and addresses the diverse needs of all learners [11]. The 4th SDG "Quality Education" strives to ensure inclusive and equitable quality education while promoting lifelong learning opportunities for everyone. To accomplish this goal, efforts have been initiated for an inclusive education system that uproots any kind of disparities in education and guarantees equal access to all levels of education and vocational training for vulnerable

populations, such as persons with disabilities, indigenous peoples, and children facing challenging circumstances. Additionally, it necessitates the construction and enhancement of educational facilities that are sensitive to the needs of children, disabilities, and gender, providing safe, non-violent, inclusive, and effective learning environments for all. Inclusive education bears numerous benefits for individuals and society as a whole. It fosters individuals' socio-emotional growth, self-esteem, and peer acceptance, diminishes discrimination, and helps fight stigma, stereotyping, discrimination, and alienation in schools and societies, cultivating social cohesion and a sense of belonging [12].

The 11th SDG "Sustainable Cities and Communities" aims to cultivate cities and human settlements that are inclusive, safe, resilient, and sustainable. Achieving this objective entails ensuring access to secure and affordable housing, basic services, and public spaces for all individuals. Moreover, it calls for the promotion of social inclusion and the reduction of inequalities, particularly among marginalized and vulnerable groups. Inclusive societies and inclusive education are indispensable components for the realization of the 4th and 11th UN Sustainable Development Goals. Attaining these goals necessitates the establishment of an inclusive education system that eradicates gender disparities, guarantees equal access to education and vocational training, and provides safe, non-violent, inclusive, and effective learning environments. Simultaneously, it requires the creation of inclusive, safe, resilient, and sustainable cities and human settlements by ensuring access to secure and affordable housing, basic services, and public spaces, and by actively promoting social inclusion while reducing inequalities. By collectively pursuing these aspirations, we can make significant strides towards building a sustainable future where no one is left behind.

The importance of learning in the sustainable management of cultural heritage is also evident through UNESCO's Thematic Indicators on Culture, which were designed in 2019 as an Annex to the 2030 Agenda for Sustainable Development. These indicators are divided into 4 categories: a) environment and resilience, b) well-being and livelihood, c) knowledge and skills, and d) inclusion and participation. The third category clearly refers to the contribution of culture to the enhancement of learning and the creation of knowledge and competencies, focusing, among others, on the transmission of local cultural values, the promotion of empowerment through the educational process that can foster cultural diversity and a deeper comprehension of sustainability. The social implications and the active involvement of local communities in cultural management are often overlooked by decision-makers and are not always included in their strategic objectives. In this direction, UNESCO has established another initiative, the Global Network of Learning Cities, which is oriented to the exchange of expertise and good practices between the participating cities.

1.2 Cultural Management: Museum Education and Digital Games

Museum education refers to the applied pedagogy that constitutes the methodological framework for the pedagogical use of the museum. That is, it simultaneously constitutes a research field of cultural management and an innovative educational practice without setting restrictions on the target groups. Thus, museums have the potential to become key public pedagogies for sustainable development [13].

Museum-pedagogical activities play a catalytic role in the learning process:

- learning becomes an "active" process based on the active participation of visitors
- active learning takes place through the transformation of ideas-information and the creation of meaning
- transformation of ideas-information is based on learning theories

The museum education practice aims to obtain an attractive and memorable experience for the visitors, emphasising both the individual and social dimensions of this experience in an inclusive learning environment. Visitor participation is widespread in museum pedagogy, making it a best practice for transmedia learning [14, 15].

Current literature shows that digital educational games have a significant role to play in museum education [16]. Digital educational games offer an engaging and dynamic learning environment, as they promote information understanding by actively involving learners in problem-solving and decision-making. Cultural digitisation may bring exhibitions to life and make historical, cultural, or scientific topics more approachable and engaging in museum education. Visuals, sound and motion sensors are common features in digital games. This multisensory technique simplifies complicated subjects and may be tailored to different learning styles making applications inclusive. This function may be used by museums to provide an engaging inclusive learning environment for visitors and adapt to a player's preferences and needs.

2 Gamified Transmedia Educational Applications for Cultural Heritage: A Dynamic Interplay of Pedagogy and Technology

An educational application or platform for cultural assets that utilize cutting-edge technology affordances such as Augmented Reality (AR), combined with traditional materials including maps, flashcards, and compass, as well as techniques of gamification and transmedia storytelling, can offer users a comprehensive learning experience that fosters active involvement with cultural heritage. This approach can engage users in meaningful discovery to gain a profound understanding of cultural heritage by adhering to sound pedagogical principles. These principles are derived from well-documented learning theories, such as behaviorism, constructivism, and social constructivism which are related to other theories including, activity theory, and discovery learning. These related theories are branches of constructivism and contribute to the overall effectiveness of the approach [17, 18]. This section demonstrates how the learning process can effectively promote and protect cultural heritage by integrating diverse theories into the design of educational applications, utilizing gamification and transmedia storytelling techniques.

2.1 Principles Based on Behaviorism

Behaviorism principles are incorporated into gamified transmedia applications, especially AR applications, to encourage users to explore cultural heritage sites and artefacts by providing positive reinforcement for their engagement in an incidental and effortless learning process [19]. AR can monitor user progress and motivate them to continue exploring by supplying structured and clear feedback. AR applications enhance users'

understanding by presenting visual and audio cues that highlight important aspects of the heritage site or artefact. Additionally, research has shown that game-based learning environments that incorporate elements of behaviorism can be effective in promoting learning outcomes. For example, a study by Plass et al. [20] found that a game-based learning environment that used a reinforcement-based approach improved students' performance on a post-test compared to a traditional lecture-based approach. The combination of positive and negative consequences is more effective than a traditional classroom-based approach. Although behaviorism principles can be used as a theoretical framework for developing AR educational gamified applications, other theoretical foundations can also be applied to create engaging and interactive experiences that promote cultural heritage, such as constructivism and social constructivism.

2.2 Principles Based on Constructivism and Social Constructivism

AR experiences that integrate constructivist and social constructivist principles can provide captivating and immersive learning opportunities that inspire users to investigate cultural heritage. Constructivist principles emphasise the importance of active, experiential learning in which learners construct knowledge and meaning from their interactions with the environment [21]. AR applications have been shown to enhance learning outcomes and engagement by encouraging users to interact with cultural assets dynamically and engagingly, promoting deeper levels of learning and understanding [22]. Furthermore, games and other interactive media can be effective tools for promoting constructivist learning, as they provide chances for users to experiment, make decisions, and receive feedback in a low-risk environment. AR games merge game structures with AR technology's immersive potential, allowing users to connect with cultural artefacts or monuments. This dynamic relationship is influenced by the interplay between constructivism and behaviorism. Vygotsky [21] also emphasises the importance of social interaction and collaboration in the learning process, arguing that learning is a social activity that occurs through dialogue and interaction with others. AR experiences can incorporate social features, such as multiplayer games or shared storytelling. By integrating elements of both constructivism and social constructivism, AR designers can create immersive and interactive experiences that encourage users to explore cultural heritage in a meaningful and engaging way.

2.3 Principles Based on Activity Theory

"Tools are created by societies over the course of human history and change with the form of society and the level of its cultural development" [21]. The principles of activity theory emphasise the importance of understanding the context of an activity, including the social interactions, tools, resources, goals and motivations that drive the activity [23]. Thus, the impact and social relevance of activity theory are based on our ability to understand how objects and activities change over time. In the context of cultural heritage, activity theory emphasises the importance of understanding the social interactions, tools, and resources that are used and re-used in the preservation and interpretation of cultural artefacts. Research has demonstrated that the use of mobile technology and AR in cultural heritage can lead to positive experiences for visitors and confirmed a strong positive correlation

between motivation and learning outcomes [24]. Studies on visitors to museums are found that the use of their smartphones to access information about exhibits, take photos, and share videos and their experiences on social media is very motivating [25]. To sum up, mobile technologies and AR have the potential to enhance the visitor experience and promote learning in cultural heritage contexts. By designing mobile applications that take into account how visitors engage with cultural artefacts through technology, museums can better meet visitors' needs and support human activities.

2.4 Principles Based on Discovery Learning

Bruner [14] who was increasingly influenced by Lev Vygotsky, stated that if individuals can approach learning as a task of "discovering something" rather than "learning about it" then they carry out their activity with the autonomy of self-reward. Discovery learning theory, as proposed by Bruner, prioritizes active student engagement in the learning process and emphasises the importance of experiencing success or failure as a means of obtaining information and the significance of context and social interaction. This approach contrasts with behaviorist principles, which rely on reward and punishment to motivate learning. By promoting student exploration and investigation of topics, providing opportunities for hands-on experimentation, and fostering critical thinking and problem-solving skills, discovery learning can facilitate deeper conceptual understanding and more effective retention of information. Additionally, this approach can promote student curiosity and enthusiasm for the subject matter by allowing learners to take an active role in their own education. The educational framework of AR relies predominantly on principles of discovery learning and behaviorism. AR applications stimulate users to explore hidden components of an image, QR code, or any other identifier, while the strictly linear sequence of AR connections links distinct elements or points. As a result, users are required to utilize prior knowledge and not simply engage in a process of trial and error. Discovery learning is the foundation of a pedagogical approach that enables users to engage with and experience cultural heritage through interactive activities.

2.5 Principles Based on Gamification

Less structured game applications that incorporate features such as rewards, points, prizes, and leaderboards are often referred to as gamification [26]. Gamification is rooted in applied behavioral psychology and relies heavily on motivation, feedback, progress, and reward, making it an integral part of any game, whether digital or not [27]. Gamification is a widely used technique with applications in many domains, including health services, education, and cultural heritage studies, as it is effective in promoting behavioral change and learning [28]. Inserting gamification techniques in educational materials is a complex process that requires collaboration among experts from various fields, including psychologists, educators, game designers, and programmers. Game elements, such as scenarios, rules, challenges, conflict, problem-solving, interactivity, social interaction, and win state, are incorporated into educational materials to enhance social interaction and improve student performance by motivating them to participate in learning activities that are typically perceived as tedious, demanding, or boring [20].

One of the main benefits of gamification is that it provides a virtual environment that encourages exploration, experimentation, and action-taking without the fear of negative consequences associated with making mistakes [29]. By creating a safe and supportive learning environment, gamification can help users overcome the fear of failure and increase their willingness to take risks and try new things. In the context of cultural heritage, AR applications overlay digital information and interactive elements onto real-world artefacts and cultural sites, such as museums and archaeological sites. Users can explore and learn about these sites in a fun and engaging way, by completing challenges, solving puzzles, and unlocking rewards. For example, users may be prompted to find hidden clues or answer trivia questions about the artefacts they encounter. By gamifying learning experiences, AR applications motivate users to engage with the cultural heritage material in a way that is both entertaining and educational.

2.6 Principles Based on Transmedia Storytelling and Transmedia Learning

Transmedia storytelling is a narrative technique that uses multiple platforms and media formats to tell a story [30]. This approach creates a more immersive experience for the audience by offering different perspectives, insights, and experiences through each medium [31]. By expanding across different media, such as books, films, pictures, flashcards, video games, and social media, transmedia storytelling can also create a more comprehensive, inclusive and nuanced understanding of the story and its characters. In summary, transmedia storytelling is a powerful tool for creating dynamic and captivating narratives that can inspire audiences across different platforms and media formats. Transmedia storytelling supports the implementation of innovative educational practices that prioritize student-centred learning and collaborative skills development. Warren et al. [32] contended that "a transmedia story is never-ending, and it is continuously reshaped with the help of peer constative feedback". Therefore, it can be considered a continuous learning process where linear learning is no longer applicable (Fig. 1).

Furthermore, knowledge is constructed through social interaction based on pre-existing knowledge. Transmedia, as a storytelling technique, served as the foundation for a novel pedagogical approach known as "transmedia learning". Transmedia learning combines traditional learning theories such as behaviorism, constructivism, and social constructivism with contemporary inclusive educational approaches and methods such as Differentiated Instruction and Universal Design of Learning. This approach uses all the available, platforms, media and tools, under the prism of multimedia learning and cutting-edge technology, such as AR, to provide a more engaging and interactive learning experience [33, 34].

3 Discovering Corfu Old Town Through a Gamified Transmedia Application

The Old Town of Corfu has been a recognized as historical monument by the Greek state since 1980 [35] and has been a UNESCO World Heritage Site (decision 31 COM 8b.40) since 2007 [36]. The Old Town of Corfu is the only Greek historic city of this size that is

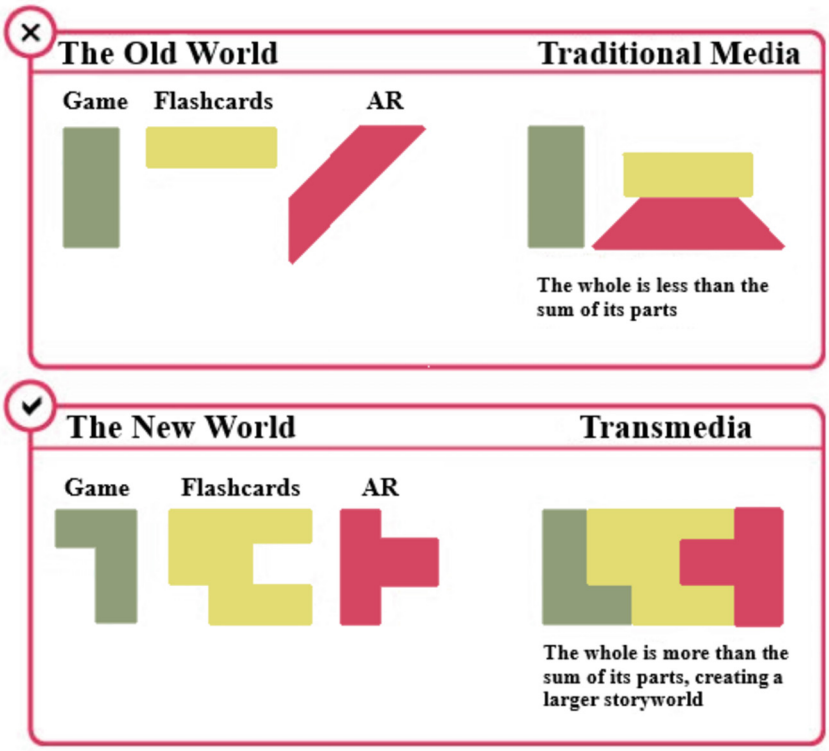

Fig. 1. Transmedia: the whole is more than the sum

mostly preserved unchanged from the Middle Ages until today, expressing with authenticity in the area, the particular historical conjuncture that shaped it. Special features of many different periods are combined in a cultural mosaic that includes fortresses, monuments, archaeological sites, historical sites, small squares, small and large parks, a road system of characteristic roads (kantounia), mansions with heterogeneous style (neoclassical, Venetian, modern, etc.), churches and other religious places, historical buildings, museums, residences, schools, shops and public and private services. The Old Town remains the main attraction of the island as a complex space and a unique cultural entity of high aesthetic values, while at the same time, it is a vibrant city that hosts the vast majority of cultural institutions and activities of the local cultural economy [37].

The Corfu old town acquires characteristics of an open-air museum, thanks to its vast expanse and multicultural character. Cultural elements, natural beauty, and the historicity of private and public spaces are harmoniously integrated with the contemporary activities of users, including permanent residents, professionals, and visitors. This creates the impression of a "living museum". As mentioned, sustainable development of the world's cultural heritage heavily relies on the acquisition of knowledge about its values and ethics. In this context and taking into account that Corfu old town is one of the most popular destinations for both formal and informal educational trips,

attracting visitors from Greece and abroad as well, our team has developed a gamified museopedagogical application named "Discover Corfu old town" (DisCot). The gamified museopedagogical application "DisCot" has been designed in the framework of the project "Hologrammatic Corfu" which has been funded by the Operational Program "Ionian Islands 2014–2020" and the European Union. "Hologrammatic Corfu's" goal was to create an interactive touristic guide for the monument of the Old Town of Corfu, using transmedia storytelling techniques. One of the main deliverables of the project was to present touristic walking tours that were accessible to people with physical barriers in mobility. More than 80 points of interest were inspected and characterised according to their accessibility status. DisCot was not an initial deliverable of the project but during the implementation phase, the vast amount of information and multimedia produced by the project led to the inspiration of this application in order to a gamification approach in the process also be included. When the game was being designed, one of the aspects assessed for the choice of the points of interest involved was the accessibility status, so that no player is left behind due to mobility restrictions.

3.1 "Discover Corfu Old Town" Game Development Life Cycle

Creating a gamified museopedagogical application, like DisCot, follows the steps of game development and requires a specific process with guidelines, called Game Development Life Cycle (GDLC) that includes the following phases (Fig. 2): (1) *Concept/Design*, (2) *Alpha version*: (i) pre-production, (ii) production, (iii) testing, (3) *Beta version*, and (4) *Release* [38].

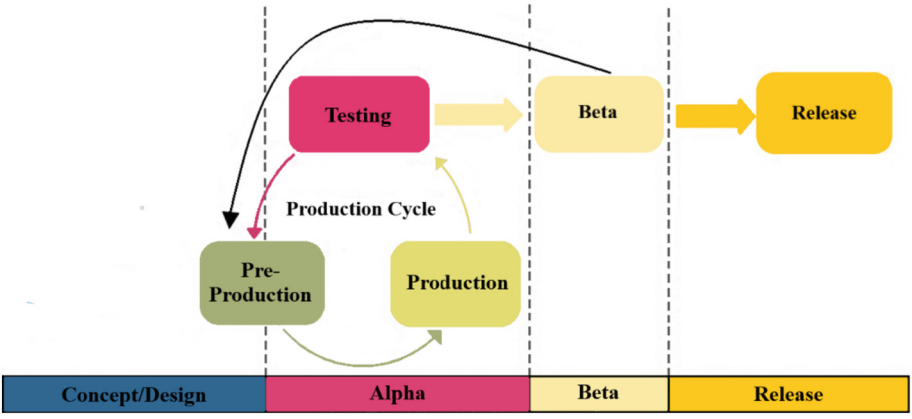

Fig. 2. Game Development Cycle (GDLC). (Source: Content Design for Inclusive Educational Environments [11])

3.2 Concept of the Museopedagogical Application DisCot

"Discover Corfu old town" (DisCot) integrates certain United Nations' SDGs. The game refers to the exploration of the Old Town of Corfu through twelve (12) selected landmarks, a multicultural World Heritage Cultural Monument and encourages the protection

of shared heritage, fostering intercultural dialogue between the players. The gameplay and the ideas behind the design are being presented, emphasising on the diversity understanding, mutual comprehension of the different aspects of the monument's history as well as inclusiveness, all of which can enhance the societal needs for peace and prosperity, which are the basic goals of United Nation's Agenda 2030.

The multiculturalism of the Old Town of Corfu is due to the historical imprint of different peoples, such as Venetians, English, and French, but also religions, such as Orthodox and Catholic Christians, Anglicans and Jews, etc. The current physiognomy of the old town incorporates the creative coexistence and inclusion of many different cultures.

Two characteristic locations-monuments of the Old Town of Corfu out of the twelve included in the game are then described, which are symbols of the city. These imposing monuments signify the city's multicultural character, as well as their reuse for the current needs of a living city. The Palace of St. Michael and St. George accommodates the Museum of Asian Art, while in Liston, many cultural and religious events take place, such as the processions of Saint Spyridon, the Patron Saint of the island. One of the most famous events is "The Breaking of Botis" on Holy Saturday during Easter. The breaking of botis (botis is the ceramic pot in Corfiot dialect) symbolises the victory of life over death.

Palace of St. Michael and St. George. Palace of St. Michael and St. George is an impressive neoclassical building which was built in the 19th century (1819–1823) during British rule in the Ionian islands, under Sir Thomas Maitland (1759–1824), the first High Commissioner of the Ionian Islands (Fig. 3). The building was designed by British Army engineer and architect Sir George Whitmore (1775–1862) and is made of Maltese tufa. In 1864, following the Union of the Ionian Islands with Greece, it became the property of the Greek state and today houses the Museum of Asian Art. The palace comprises a central three-storey p-shaped building which connects to two side wings through an outer Doric peristyle. Two gates surround the building, the gate of St. Michael and the gate of St. George. The main entrance leads to the ground floor which includes a magnificent staircase leading to the first floor where the monumental halls of the Order of St. Michael and St. George are housed. The permanent exhibitions of the museum are showcased in these halls. The exhibition extends to the second floor of the building.

Liston. Liston, one of the most important sights of Corfu, is located in the western part of Spianada Square (Fig. 4 and 5). It is a residential complex and its construction began during the French Empire (1807–1814). It was built by the French diplomat Matthieu de Lesseps (1771–1832). The Corfiot engineer and military officer, Ioannis Parmesan (1748–1826) drew up the plans and partly undertook construction supervision. The external features of Liston are slightly inspired by the Rue de Rivoli de Paris and the Napoleonic architecture of the period. At the same time, care was taken to maintain its uniformity and to be consistent with the prominent buildings of the previous Venetian historic town, such as the Kompitsi mansion and the building of San Giacomo theatre which today houses the Town Hall.

The incorporation of these particular landmarks into the gamification approach is crucial for promoting intercultural understanding. These well-known locations, rich in historical and cultural significance, may assist people from different backgrounds to

Fig. 3. Palace of St. Michael and St. George

Fig. 4. Liston

Fig. 5. The Breaking of Botis

interact meaningfully and learn from one another. People can have a greater understanding of various cultures, traditions, and values by visiting these places, which promotes respect and regard for one another. The sharing of thoughts, experiences, and viewpoints on these websites aids in shattering stereotypes, bridging cultural divides, and fostering a sense of interconnectedness across cultures. In the end, the Old Town of Corfu might act as a compelling symbol that brings people together, encouraging harmony and intercultural understanding. As it emphasises the significance of inclusive and diverse educational approaches in attaining sustainable development, intercultural understanding is directly related to learning theories and the United Nations Sustainable Development Goals. Learning theories encourage including different experiences and cultural views in the learning process. They place a strong emphasis on how interaction, communication, and cooperation between people from various backgrounds may advance information sharing and promote cross-cultural understanding.

3.3 Designing the Museopedagogical Application "DisCot"

DisCot aims to enrich visitors' experience and facilitate learning about the historical and cultural significance of the Old Town of Corfu. In addition, DisCot has the potential to contribute to visitors' comprehension of the artworks and history presented in Corfu's museums. Regarding organized educational school trips, students explore the selected monuments of Corfu's Old Town alongside their educators. In this way, they can learn basic historical information effortlessly and through playful methods. At the same time,

they cultivate a set of "transferable" skills, such as spatial orientation, compass use, reading a traditional map, and getting accustomed to AR applications. Similarly, individual visitors, whether they belong to a special category such as a family or a group of visitors with particular characteristics such as a group of students-tour guides from other areas, explore and delve deeper according to their interests. They can discover Corfu's Old Town through the lens of history and culture.

Scenario – Rules. Visitors explore twelve (12) selected landmarks of the Old Town of Corfu through the process of the "Treasure Hunt Game" and discover hidden information. The twelve (12) selected landmarks of the Old Town of Corfu through which the game of hidden treasure unfolds are (Fig. 6):

1. Old town's fortresses
2. Statue of Schulenburg
3. Palace of St. Michael and St. George
4. Liston
5. Saint Spyridon church
6. Well mouth in Kremasti Square (campo veneziano)
7. The Metropolitan Church of Our Lady Spilaiotissa, St Vlasios and St Theodora Augusta
8. Gate of the New Fortress
9. Jewish synagogue "Sinagoga Vecchia"
10. Annunziata Bell Tower
11. "Duomo" Cathedral of Saints James and Christopher
12. Town hall (Loggia Nobilei-The Nobles Arcade)

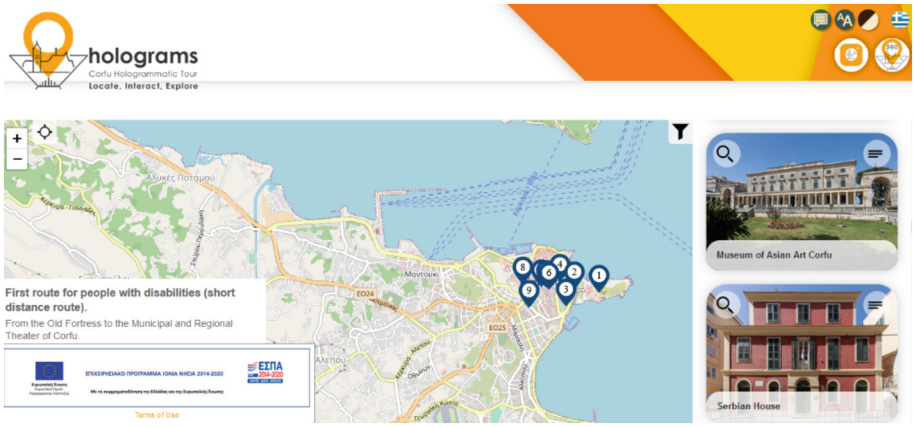

Fig. 6. Discovering the hidden information about Corfu old town

DisCot begins at the hotel where the guests are staying, to directly involve local professionals in the procedure. The teacher or the team leader picks up the game material from the reception, which is a chest including 60 folders (5 per location), a compass and

Fig. 7. DisCot material

a vintage map of Corfu (Fig. 7), and informs the group that they are going to play a game. Until then, the students or the team are not aware that they are going to participate in game activities. The first folder, which is also known as the folder of point 0, includes a QR code that, when scanned, provides players with the necessary information to find the Old Fortress. Old Fortress is point 1 which is the first of the twelve points of interest and the action begins. To connect the twelve points, players must answer questions that utilize their knowledge and the various tools provided, including AR overlays, flashcards, the compass, and the map. After reaching point 12, the game is complete. While the game is well-organized, both team leaders/educators and players may expand the activities by exploring other aspects of the points.

Challenges, Conflicts, and Problem-Solving of DisCot. The challenges, conflicts, and problem-solving refer to the issues that players attempt to address and resolve, such as the correct sequence of activities that will lead them to the right point.

Interactivity - Social Interaction of DisCot. Successful interaction is achieved through computer-mediated interaction (smartphone/tablet), narration, pedagogical agents (who confirm answers and reward students), and peers who act as pedagogical agents as well (peer mentoring).

Win-State of DisCot. DisCot is a game that can be played by a single team or by multiple teams, depending on the players' number. The game's competitive nature, with the winning team being the one that completes the game first, serves as a motivational factor for students to achieve success in addition to the completion of the museum education application.

3.4 Assessing the Museopedagogical Application "DisCot"

Any product, especially when it comes to an educational application, requires evaluation before release. The development of DisCot relies on the dynamic composition of the members of a transdisciplinary design team consisting of a historian, a tour guide, a cultural heritage manager, a psychologist, an educator, and IT/game developers. According to the Game Development Life Cycle, a series of internal evaluations will take place during the development of the prototyping, both for issues related to the gameplay experience and the sequence of points of interest, as well as for technological issues. The app will then be given to potential users, such as teachers and students with and without mobility and learning difficulties, to evaluate. Their evaluations will be taken seriously to improve the application to be distributed to the hotels and then to the participants of organised educational tours as well as individual visitors. Also, the application will be distributed to schools in Corfu, so that locals can also engage in a playful learning experience and get to know aspects of their city that they might not be aware of.

4 Conclusion

The unique capabilities that each component of the gamified transmedia educational application offers to create an engaging and interactive learning experience for users are referred to as the component's dynamic affordances. The above-described application

takes advantage of different media and technologies to create a seamless and immersive learning experience that motivates users to interact with the information and actively participate in the learning process by employing a gamified and transmedia approach. Interactivity, feedback, personalisation, and social interaction are just a few examples of the dynamic affordances that each component can offer. These elements all help to make learning more effective and interesting. The integration of gamification into tourism experiences can be a powerful tool for incorporating learning theories and promoting the United Nations Sustainable Development Goals (SDGs) in the context of sustainability. Overall, this chapter illustrated how the learning process may be a useful tool when integrated with a gamified transmedia application and how gamification can improve travellers' engagement and knowledge acquisition by implementing learning theories like game-based learning or experiential learning.

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