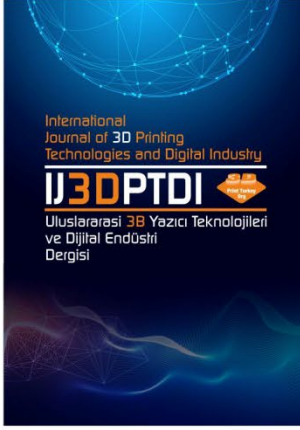




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TRANSFORMING VIRTUAL REALITY TOURISM THROUGH THE CYBER ISPARTA YOUTH CENTER

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ABSTRACT

In recent years, virtual reality (VR) technology has transformed various sectors, and tourism is no exception. Virtual reality tourism offers an innovative way for people to experience the world without actually leaving their homes. In this research, the "Cyber Isparta Youth Center" project, supported by the Western Mediterranean Development Agency, implemented by the Isparta Municipality and in partnership with the Isparta University of Applied Sciences, will be discussed in terms of education and tourism. Within the scope of the project, a virtual reality tour of the Cyber Isparta Youth Center was developed. The developmental research strategy, a variant of the design-based research method, was used. Cyber Isparta Youth Center has been modeled in the Unity Game Engine. A semi-structured interview was conducted to examine the effects of the virtual tour. Participant opinions were categorized into three primary groups based on the content analysis: tourism & usability, technological experience, and educational value.

Keywords: Virtual reality, Tourism, Youth Center, Unity.

1. INTRODUCTION

In recent years, virtual reality (VR) technology has transformed various sectors, and tourism is no exception. Virtual reality tourism offers an innovative way for people to experience the world without actually leaving their homes. This article explores what virtual reality tourism entails, its benefits, current examples, and its future potential, accompanied by relevant references. Virtual reality tourism refers to the use of VR technology to create immersive travel experiences. This technology allows users to explore destinations in a simulated environment, providing a 360-degree view of landscapes, historical sites, and cultural landmarks. With VR headsets, users can walk through famous streets, visit museums, or even partake in activities such as skydiving or underwater diving, all from their living rooms [1].

One of the most significant advantages of virtual reality tourism is that it makes travel accessible to everyone. Individuals with physical disabilities, health issues, or financial

constraints can explore destinations they may never have the chance to visit in real life [2]. Traveling can be expensive, considering accommodation, flights, food, and activities, but VR tourism eliminates these costs, allowing users to experience various destinations without the financial burden [3].

VR allows travelers to explore unfamiliar places without risk, as adventurous activities, like bungee jumping or hiking in remote areas, can be experienced safely in a virtual environment [4]. Experiencing a destination through VR can ignite a desire to visit in person, by providing a taste of what's available, virtual reality can promote actual travel plans [5]. Educational institutions can use VR to take students on virtual field trips, showcasing historical sites, natural wonders, or artistic masterpieces [6].

Several companies and organizations have started integrating VR experiences into their offerings. For instance, airlines and travel agencies now provide virtual tours of destinations to enhance booking experiences.

Museums and cultural institutions are also embracing VR by creating digital exhibits and virtual events [7]. Platforms like Oculus, HTC Vive, and Sony PlayStation VR host a variety of travel-related content, allowing users to explore locations such as Machu Picchu or the Great Barrier Reef. Additionally, tourism boards are increasingly employing VR in their marketing strategies to entice potential visitors [8].

In this research, the "Cyber Isparta Youth Center" project, supported by the Western Mediterranean Development Agency, implemented by the Isparta Municipality and in partnership with the Isparta University of Applied Sciences, will be discussed in terms of education and tourism.. Within the scope of the project, a virtual reality tour of the Cyber Isparta Youth Center was developed.

2. METHODOLOGY

The developmental research strategy, a variant of the design-based research method, was used in this study. Design-based research is used to develop learning tools [9]. Product design and educational program development are the two types of developmental research product or program development [10]. In this study, using the developmental research product method, virtual reality material has been developed. Cyber Isparta Youth Center has been modeled in the Unity Game Engine. Software Development Kit (VR SDK) is configured for Oculus glasses.

The application development stages are presented below;

Stage and Camera Settings for VR: When using VR glasses, you need to use special VR cameras instead of traditional Unity cameras. The main camera was removed and a new VR camera prefab, OVRCameraRig prefab, was added to the scene depending on the targeted VR SDK.

Adding VR Glasses Controls: Appropriate controller prefabs were added to the scene to interact with VR controllers (hand levers, motion sensors, etc.). Oculus SDKs provide the necessary components to manage the inputs of VR controllers.

Interaction and Movement: Movement in the VR environment is usually done with a

"teleportation" (jumping) or "free movement" system to provide user movement. Ready-made movement scripts and teleportation systems were used with the Oculus SDK. Interactions were added using interactive objects colliders and raycast for the user to receive instructions in mission mode. The primary character performs tasks with interactions such as grabbing, picking up and throwing objects.

Testing and Editing: To connect and test the VR headset, the VR headset was connected to the computer and worked on in the Unity Editor to test the developed project. During the test, interactions in the scene were observed using the headset. For optimization, the frame rate was optimized to reach up to 90 fps. In addition, optimization techniques such as LOD (Level of Detail), occlusion culling, light baking and efficient asset management were applied.

Finalization and Publishing: While creating VR projects, the VR headset was selected as the target when making project settings for the target platform Oculus.

A semi-structured interview was conducted to examine the effects of the virtual tour in terms of education and tourism. 30 users were asked what they thought about the tour after the virtual tour experience. User opinions were presented in the form of category, code and frequency with content analysis.

3. FINDINGS

3.1. Cyber Isparta Youth Center

Isparta Municipality, in partnership with Isparta University of Applied Sciences, has put into service the Western Mediterranean Development Agency's 'Entrepreneurship Ecosystem Development Financial Support Program' under the name Cyber Isparta Youth Center for the development of young people (Figure 1).



Figure 1. Cyber Isparta Youth Center.

The center provided training in many areas such as cyber security, mobile and web-based application development, robotic coding, social media expertise, and digital assistance (Figure 2).



Figure 2. Course participants.

In addition to the trainings, Cyber Isparta Youth Center has pre-incubation rooms for students to develop projects in research and development classes (Figure 3).



Figure 3. Pre-incubation rooms.

3D printers and virtual reality glasses are provided to the users free of charge at the center for the project development of the company candidates (Figure 4). There have been many IT projects developed at the Cyber Isparta Youth Center, one of which is the virtual reality tourism project.



Figure 4. 3D printers and virtual reality glasses.

3.2. Virtual Reality Tourism: Cyber Isparta Youth Center

Cyber Isparta Youth Center virtual reality tourism project was developed for promotional purposes. It allows the center to be visited with virtual reality glasses. In fact, the center aims to be visited with virtual reality technology and to attract visitors to the center (Figure 5).



Figure 5. Cyber Isparta Youth Center building exterior.

Cyber Isparta Youth Center Virtual Tour has been modeled in the Unity Game Engine and coded with C#. Visitors can view classrooms where training is given on informatics (Figure 6).

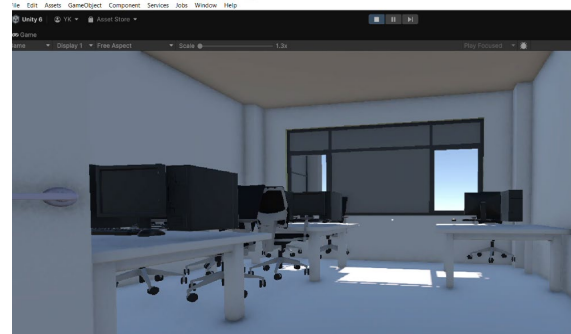


Figure 6. Classrooms.

In the Cyber Isparta Youth Center virtual reality tourism project, the center facilities are presented in a virtual environment. In the virtual tour, the visitor can tour the center as visitor wishes. Visitor can view the virtual universe classroom, robotics classroom and 3D printer facilities (Figure 7, Figure 8).



Figure 7. Virtual universe classroom

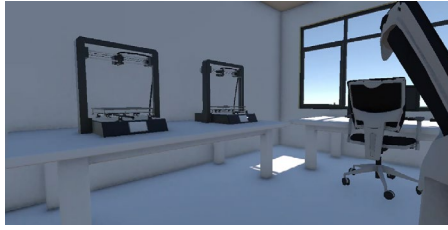


Figure 8. 3D printer.

In the virtual tour, visitors can also visit the "research and development halls" and the pre-incubation center. During the tour, information about the center is given by voice.



Figure 9. Research and development halls.

Also, the visitor can take part in the virtual tour and must follow the instructions to perform the task. For example, the tasks of starting the 3D printer and taking the virtual reality glasses to the instructor are presented in Figures 10 and 11.



Figure 10. Starting the 3D printer task.

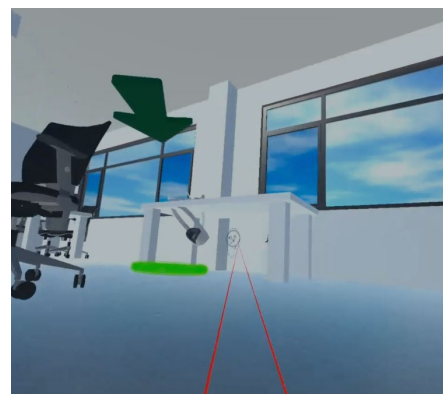


Figure 11. Taking the virtual reality glasses to the instructor task.

3.3. Virtual Tour Participant Opinions

According to the content analysis, participant feedback was grouped under three main categories: Educational Value, Technological Experience, and Tourism & Usability. In the Educational Value category, the most frequently mentioned theme was interaction, with a frequency of 9 (see Table 1). This was followed by attractiveness (7), learning (6), instructiveness (5), and encouragement to technology (5). Within the Technological Experience category, the most emphasized codes were use of technology (7) and realism (6), indicating participants' appreciation of the strong and immersive technological infrastructure. In the Tourism & Usability category, accessibility was highlighted most frequently (8), followed by promotion (5), touristic value (4), user-friendliness (4), multi-purpose design (4), smooth navigation (3), and scalability (3). These findings indicate that the virtual tour is perceived as an effective tool in both educational and digital tourism contexts.

Table 1. Participants' opinions virtual reality tourism

Category	Code	F
Educational Value	Attractiveness	7
	Interaction	9
	Learning	6
	Instructiveness	5
	Encouragement to Technology	5
Technological Experience	Realism	6
	Use of Technology	7
Tourism & Usability	Accessibility	8
	Promotion	5
	Touristic Value	4
	User-friendliness	4
	Smooth Navigation	3
	Multi-purpose Design	4
	Scalability	3

Sentences quoted verbatim from the participants' virtual tour opinions:

Educational Value

"The virtual tour was very appealing and kept my interest throughout. The environment was engaging and visually captivating." (Attractiveness, f=7).

"I really enjoyed the interactive tasks in the VR tour. It wasn't just passive viewing; I could actively participate and complete tasks." (Interaction, f=9).

"I learned a lot about technology, robotics, and 3D printing. The virtual tour provided a great opportunity to understand these topics in depth." (Learning, f=6).

"The tasks in the virtual tour were very informative. I could easily understand the concepts being taught through the interactive components." (Instructiveness, f=5).

"This tour really inspired me to learn more about the technology behind virtual reality and robotics. It made me more interested in these fields." (Encouragement to Technology, f=5).

Technological Experience

"The sense of realism was incredible. It felt like I was actually there, interacting with the technology and machinery in the classes." (Realism, f=6).

"The use of technology was amazing. The VR setup, along with the robotics and 3D printing demonstrations, was a seamless experience that made everything feel cutting-edge." (Use of Technology, f=7).

Tourism & Usability

"The tour was very easy to access, and I had no trouble navigating through the virtual environment. It was user-friendly and available to anyone." (Accessibility, f=8).

"This virtual tour is a great promotional tool for the Isparta Youth Center. It allows people to explore the center without physically visiting it." (Promotion, f=5).

"For tourists, this is a great way to explore Isparta from a distance. It provides a unique experience that highlights the region's technological achievements." (Touristic Value, f=4).

"The interface was very intuitive, and I had no trouble finding my way through the different classes and tasks. It was simple yet effective." (User-friendliness, f=4).

"Navigation within the tour was very smooth. I never got lost and could easily move between

different areas of the center." (Smooth Navigation, f=3).

"I like how this virtual tour serves multiple purposes. It's not only educational, but also functions as a digital tourism tool, allowing both tourists and students to engage." (Multi-purpose Design, f=4).

"I believe this system could be scaled to reach even more people, which would be great for educational and tourism purposes in the future." (Scalability, f=3).

4. RESULTS AND DISCUSSION

Informatic literacy initiatives at youth centers continue to have a significant impact on closing the digital divide [11]. These initiatives level the playing field and provide equal chances for success by guaranteeing that all young people have access to the required resources and information. Another significant result is the promotion of creativity and innovation [12]. Young people are better equipped to create, develop, and make significant contributions to society as their informatics skills improve [13-14]. Young brains may turn ideas into reality when they are exposed to coding, digital design, and data science since these fields foster an imaginative mentality.

Youth development is revolutionized by the incorporation of informatics literacy programs into youth centers [15-16]. By utilizing these easily available educational tools, creating encouraging surroundings, putting successful programs into place, and tackling the digital divide, we lay the groundwork for a better, more technologically savvy future [17].

As technology continues to advance, the future of virtual reality tourism looks promising. Improvements in VR hardware and software will allow for even more immersive and realistic experiences. Integration with artificial intelligence (AI) could personalize experiences based on user preferences, while advancements in haptic technology could provide a tactile element to virtual tours [18]. Moreover, as global travel continues to face challenges such as pandemics and environmental concerns, virtual reality tourism may offer a sustainable alternative. Travelers can explore the world and its wonders without the carbon footprint that physical travel often incurs [19-20].

5. CONCLUSION

Virtual reality tourism is revolutionizing the way we think about travel. By making exploration accessible, cost-effective, and safe, VR opens up a world of possibilities for those eager to experience new places and cultures. As technology evolves, the virtual tourism landscape will expand, offering even more immersive experiences. Whether as a supplement to traditional travel or as a stand-alone experience, virtual reality tourism is here to stay, inviting everyone to explore the globe from the comfort of their homes.

VR is helping to transform the tourism sector by offering significant opportunities and innovative experiences. Some of the benefits of virtual reality in tourism are:

- Virtual tours and promotions,
- Cost and time savings,
- Accessibility and inclusiveness,
- Education and information,
- Post-trip interaction,
- New marketing and sales opportunities,
- Facilitating travel decisions,
- Individual experiences and needs.

Participant opinions were categorized into three primary groups based on the content analysis: Tourism & Usability, Technological Experience, and Educational Value. In terms of educational value, the most emphasized code was interaction (f=9). Participants highlighted not only passive viewing but also the importance of task completion and interactive learning processes. Regarding the technological experience, participants particularly emphasized the sense of realism and the effective use of technology. From the perspective of tourism and usability, the system's accessibility (f=8) and its potential for promotion were found to be significant. Additionally, the multi-purpose structure of the application, which appeals to both tourists and students, was particularly noteworthy.

As result, virtual reality offers great potential in the tourism sector for both travel companies and tourists. VR is used as a very important tool both in terms of marketing and in the decision-making processes of tourists. It also creates significant opportunities in terms of accessibility and inclusiveness.

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REFERENCES

1. Duziak, D., "Blockchain for Hospitality and Tourism: A Guide to the Future", Pages 87-113, Apress, Newyork, 2023.
2. Foggin, B., "Tourism in the leisure lives of people with disability". Buhalis D. and Darcy S. Editors, Accessible Tourism, Pages 98-122, Channel View Publications, Bristol, 2011.
3. Siddiqui, M. S., Syed, T. A., Nadeem, A., Nawaz, W., and Alkhodre, A., "Virtual tourism and digital heritage: an analysis of VR/AR technologies and applications", International Journal of Advanced Computer Science and Applications, Vol. 13 Issue 7, 2022.
4. Mallikarjuna, B., Sebastian, S., Chandra, R., Dadheech, P., and Sharma, M., "Virtual Reality in Tourism Industry within the Framework of Virtual Reality Markup Language", IEEE 3rd World Conference on Applied Intelligence and Computing (AIC), Gwalior, Pages 274-279, 2024.
5. Vinnakota, S., Mohan, M. D., Boda, M. J., Askarzai, W., Devkota, M. P., Shetty, M. S., and Choden, M. T., "Venturing into virtuality: exploring the evolution, technological underpinnings, and forward pathways of virtual tourism", Educational Research (IJMCER), Vol 5 Issue 6, Pages 08-49, 2023.
6. Asif, M., Mondal, A., Soumil, S., Das, A., & Sahoo, P., "Augmented Reality and Virtual Reality in Education: A Transformative Journey into Immersive Learning Environments", Kumar, R., Dhar, A., Banerjee, A. and Mahapatra, a. Editors, Advances in Computational Solutions, Pages 185-204, 2024.
7. Kamariotou, V., Kamariotou, M., and Kitsios, F., "Strategic planning for virtual exhibitions and visitors' experience: A multidisciplinary approach for museums in the digital age". Digital Applications in Archaeology and Cultural Heritage, Vol. 21, e00183, 2021.

8. Buhalis, D., Leung, D., and Lin, M., "Metaverse as a disruptive technology revolutionising tourism management and marketing", *Tourism Management*, Vol. 97, 104724, 2023.
9. Brown, A. L. "Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings". *Journal of the Learning Sciences*, Vol. 2 Issue 2, Pages 141–178, 1992.
10. Richey, R.C., Klein, J.D. and Nelson, W. A., "Development research: Studies of instructional design and development", Jonassen D. H. Editor, *Handbook of research for educational communications and technology*, Mahwah, NJ: Lawrence Erlbaum Associates, Pages 141-150, 2013.
11. Detlor, B., Julien, H., La Rose, T., and Serenko, A., "Community-led digital literacy training: Toward a conceptual framework". *Journal of the Association for Information Science and Technology*, Vol. 73 Issue 10, Pages 1387-1400, 2022.
12. Rayna, T. and Striukova, L., "Fostering skills for the 21st century: The role of Fab labs and makerspaces", *Technological Forecasting and Social Change*, Vol. 164, 120391, 2021.
13. Stofkova, J., Poliakova, A., Stofkova, K. R., Malega, P., Krejnos, M., Binasova, V., and Daneshjo, N., "Digital skills as a significant factor of human resources development". *Sustainability*, Vol 14 Issue 20, 13117, 2022.
14. Li, L., "Reskilling and upskilling the future-ready workforce for industry 4.0 and beyond", *Information Systems Frontiers*, Vol. 26, Pages 1694-1702, 2022.
15. Buchan, M. C., Bhawra, J., and Katapally, T. R., "Navigating the digital World: Development of an Evidence-Based Digital Literacy Program and Assessment Tool for Youth", *Smart Learning Environments*, Vol 11 Issue 1, Pages 1-24, 2024.
16. Özcan, B., "Impact of Demographic Characteristics on Information Management Attitudes Among Youth Center Directors. *Journal of Education and Recreation Patterns*", Vol. 5 Issue 2, Pages 265-284, 2024.
17. Kelly, K. and Zakrajsek, T. D., "Advancing online teaching: Creating equity-based digital learning environments", Taylor and Francis, Newyork, 2023.
18. Bhowmik, A. K., "Virtual and augmented reality: Human sensory-perceptual requirements and trends for immersive spatial computing experiences", *Journal of the Society for Information Display*, Vol. 32 Issue 8, Pages 605-646, 2024.
19. Siddiqui, S. and Sujood., "Promoting carbon neutrality: Indian tourists' intentions to adopt energy-saving behaviours", *Current Issues in Tourism*, Vol. 27 Issue 23, Pages 1-21, 2024.
20. Singh, B., "Assimilating Virtual Reality (VR) for Environmental Conservation in Tourist Spots". *In Solutions for Managing Overtourism in Popular Destinations* IGI Global Scientific Publishing. Pages 193-212, 2025.