THE THESIS OF THE PHD DISSERTATION

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GÖDÖLLŐ

2024

Hungarian University of Agriculture and Life Sciences

Exploration of Virtual Tourism as an Independent Frontier Affected by COVID-19

Doctoral (PhD) dissertation

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Gödöllő, Hungary
2024

Hungarian University of Agriculture and Life Sciences

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TABLE OF CONTENTS

1. INTRODUCTION

The goal of the Introduction chapter is to provide an overview of the historical and technological landscape, emphasizing the integration of personal computers and smartphones into everyday life and the emergence of virtual reality (VR) as a significant advancement. It highlights VR's potential to simulate real-world environments and enhance various experiences, particularly in the realm of tourism. The chapter sets the stage for the research by outlining the significance of VR and virtual tourism (VT) and introducing the focus on specific population segments, such as people with motor disabilities (PwD) and people without disabilities (PwithoutD).

1.1 Tourism

The inception of travel dates to the earliest existence of humanity, manifesting itself in various forms throughout history. In ancient times, nomadic lifestyles were necessitated by the pursuit of sustenance, compelling prehistoric individuals to move in search of food or to escape adverse weather conditions and possible enemies and predators (Kennedy, 2023). The establishment of settlements marked a shift away from constant wandering, leading to the emergence of travel as a means for economic endeavours. Merchants embarked on journeys to foreign lands to enhance trade prospects and seek better prices for their goods in the foreign lands (Department of Ancient Near Eastern Art, 2000).

The intertwining of travel with religious motivations became apparent as pilgrimage and missionary travel gained prominence. Pilgrims embarked on sacred journeys to revered places, while missionaries ventured abroad to propagate their beliefs. Simultaneously, the elite class, privileged in wealth and education, indulged in travel for educational pursuits, medical reasons, and leisure (Casson, 1994).

Advancements in technology, particularly the development of steam trains, cruise liners (Brooks, 2012), and civil aviation, ushered in a new era, democratizing travel for the burgeoning middle class. This shift was further catalyzed by the establishment of tourist companies, exemplified by pioneers like Thomas Cook in Europe (Singh, 2008; Kripps, 2019). These companies offered comprehensive travel packages encompassing transportation to and from the destination, accommodation, catering, transportation within the touristic destination, travel insurance, and a range of guided excursions, making travel a more accessible and widespread practice for mass tourism (Pons, et al., 2016).

The popularisation of traveling led to the creation of tourism organizations worldwide (e.g. UNWTO, WTTC, etc.), at the national level in most modern countries, and local governments

and Destination Management Organizations (DMO). Their goal is to define tourism, classify different traveling by its purpose, and control the activity of the elements of the tourism sector. Before the global COVID-19 pandemic in 2020, tourism stood as one of the most vital industries worldwide, contributing significantly to the global economy. In 2019, tourism's share of the global Gross Domestic Product (GDP) amounted to 10%, highlighting its economic importance (WTTC, 2020). The United Nations World Tourism Organization (UNWTO) reported that 1.3 billion people travelled globally in 2018, with a slight increase to 1.4 billion in 2019 (Blackall, 2019).

However, the emergence of the COVID-19 pandemic had profound repercussions, impacting not only tourists but also the millions of individuals employed within the tourism sector. UNWTO predictions estimated significant losses, including up to 1.1 billion international tourists, a staggering 1.2 trillion US dollars in export revenues, and the potential loss of 120 million jobs (Aljazeera, 2020). Governments worldwide implemented various protective measures, from mandatory COVID testing and mask mandates to complete lockdowns, exacerbating the challenges faced by the tourism industry.

Factors such as financial constraints, health concerns, and unpredictable circumstances contributed to people's reluctance to travel during the pandemic (Polishchuk, 2020). In 2022, certain governments still maintained special conditions for tourists entering their countries. In such a context, the integration of VR in the tourism industry emerges as a promising solution, offering accessibility to tourism experiences without the constraints posed by external factors or unforeseen circumstances. VR has the potential to make tourism available to everyone at any time, overcoming the limitations imposed by global crises and ensuring a more resilient and inclusive tourism sector.

The lockdowns implemented in Italy led to the rise of "digital home-based gastronomy tourism experiences" that catered to VT dining activities. These activities included remote social dining and partying, as well as online cooking classes and courses. The aim of VT in this context was to replicate gastronomic activities through video conferencing, to inspire actual visits to tourism destinations once post-pandemic travel resumes since it creates a pre-experience of a place (Garibaldi & Pozzi, 2020).

As humanity navigates the new millennium, the pervasive influence of technology on daily live has become increasingly pronounced, especially in the wake of the Fourth Industrial Revolution (Industry 4.0) (Bai, et al., 2020). This transformative era is characterized by embedded connectivity, giving rise to a metaverse that permeates society and fundamentally alters the human experience of the world. In essence, it propounds the notion that contemporary

individuals are not merely beholden to their natural senses and industrial capabilities but are instead entering an era of augmented social reality (Philbeck & Davis, 2018).

1.2 Technologies

In the year 2024, personal computers and smartphones seamlessly integrate into the fabric of everyday existence. Notably, virtual reality (VR) has emerged as a focal point of technological advancement, evolving on a grand scale. VR is a completely synthetic, computer-simulated environment that mimics the real world and allows users to feel as though they are present in a real-world environment with no physical or geographic boundaries and barriers, where one can navigate and possibly interact with a virtual world, resulting in the real-time simulation of one or more of the user's five senses (Bruno, et al., 2010; Yusoff, et al., 2011; Desai, et al., 2014; Bogicevic, et al., 2019; Yung & Khoo-Lattimore, 2019; Loureiro, et al., 2020). Its applications span various industries, with the tourism sector being no exception. VR has been embraced as an immersion tool, offering unprecedented ways to enhance the travel experience (Alsop, 2022). The usage of a variety of interactive devices such as helmets, data gloves, or sensory feedback devices is significant to meet the needs of the scene and tasks and to control the environment (Tatzgern, et al., 2015).

Despite its use in several industries as an immersion tool (Kavanagh, et al., 2017; Damiani, et al., 2018), the integration of VR in the tourism sphere remains an occasional phenomenon, currently manifesting primarily as a tool employed for marketing, education, and strategic planning purposes (Cho, et al., 2002; Guttentag, 2010; Beck, et al., 2019; Wei, et al., 2023; McLean, et al., 2023; El Archi & Benbba, 2023).

However, despite early enthusiasm, challenges arose as false advertisements and exaggerated promises about VR's capabilities left users dissatisfied. This potential negative perception prompted the adoption of the term "virtual environment" (VE) by some authors, introducing a semantic distinction that sought to address perceived differences between VR and VE. Scholars continue to debate whether these terms are interchangeable (Schroeder, 2008) or carry nuanced distinctions (Luciani, 2007; Sherman & Craig, 2018). While they emerged almost simultaneously and essentially mean the same thing, the slight variations in origin and usage have prompted ongoing discourse among researchers. For the sake of clarity, in current research, both VR and VE are treated as interchangeable.

Amidst these semantic debates, VR enthusiasts have persistently advanced technology and developed new equipment. Ivan Sutherland's creation of the first head motion device in 1968 marked a significant milestone (Carmigniani & Furht, 2011), and researchers at the

Massachusetts Institute of Technology in 1970 pioneered the development of the first interactive map (Naimark, 1978). The 2000s witnessed a surge in VR's popularity, especially within the gaming realm. A plethora of gadgets, including head-motion devices, joysticks, and controllers (Terando, et al., 2007), were designed to enhance the gaming experience, enabling users not only to observe but also to interact with the VEs presented to them.

However, the concept of VT, which is based on VR, is in the exploratory phases. In contrast to conventional tourism, where physical travel to destinations is essential, VT introduces a distinctive alternative. Virtual tours, within this context, present virtual tourists with unique advantages that may elude their real-world counterparts (El-Said & Aziz, 2022). These benefits encompass the ability to explore diverse locales without the constraints of physical travel, partake in remote experiences of historical events or architectural wonders, and engage with different cultures within a virtual realm. The potential of VT lies in its ability to transcend the limitations of physical travel, offering an innovative way for individuals to explore the world. As technology continues to advance, the immersive and interactive nature of VT may redefine the traditional travel experience. This not only broadens accessibility for those facing barriers to physical travel but also opens new avenues for exploration, education, and cultural exchange in a digital landscape.

Amidst the challenging landscape of the COVID-19 pandemic, Chinese authors introduced the term "cloud tourism" to encapsulate the concept of virtual travel facilitated by modern gadgets and cutting-edge technologies (Pan & Yu, 2020). This includes the immersive realms of VR, augmented reality (AR), and 360° panoramic video, allowing individuals to embark on virtual journeys from the safety of their homes. While the moniker gained prominence during the pandemic, the notion of using VR in tourism has roots traced back to the 1990s. Current research emphasizes the application of VR in the tourism domain (Guttentag, 2010; Beck, et al., 2019; Fan, et al., 2022). This conceptual shift has ushered in a transformative era, altering the traditional tourism experience by bringing scenic wonders directly into the homes of enthusiasts. This shift towards VT has become a focal point in research, elucidating its pivotal role in the high-quality development of tourism.

Before the advent of the pandemic in 2020, tourism stood as one of the pillars of the global economy, with some countries relying heavily on its contributions (Sathiendrakumar & Tisdell, 1989; Sr & Croes, 2003; Sharma, et al., 2021). However, the emergence of COVID-19 necessitated swift and stringent measures, including the suspension of tourist activities, to safeguard citizens from the perils of the virus. The tourism industry bore the brunt of these protective measures, experiencing severe disruptions. Live streaming of tourism gained

popularity during the pandemic in China (CGTN, 2020). Numerous tourism destinations, travel agencies, and individuals initiated live streaming of tourism experiences through various platforms, including TikTok, WeChat, Kwai, Weibo, Mafengwo, etc. During the early phases of the pandemic, the VT movement was organized through collaboration with a tourism advisor in Malaysia. Their VT version involves live broadcasting on travel websites, such as Airbnb, where web users can experience a guided walking tour around various tourism site. In Italy, a nation heavily impacted by the pandemic, gastronomic tourism sites have also adopted interactive online experiences, utilizing AR and VR, to sustain connections with consumers (Garibaldi & Pozzi, 2020). The pandemic crisis has notably driven an increase in tourist engagement with VT (Sigala, 2020).

Even after four years, remnants of the pandemic persist, with some countries maintaining restrictions on tourist visits. The data from October 2022 indicates a resurgence in the number of infected individuals, hinting at the possibility of a new wave. The persistence of similar data trends at the beginning of August 2023 and at the end of December 2023 underscores the enduring challenges faced by the global community in managing the impact of the ongoing COVID-19 pandemic. Despite efforts to contain the virus and alleviate its consequences, the recurrence of comparable data suggests a sustained struggle to curb the spread and implications of the virus (WHO, 2023). In this climate of uncertainty, VR emerges as a timely contender to redefine tourism, offering a viable alternative that aligns with the current global scenario.

As the world grapples with the unpredictability of the ongoing health crisis, the integration of VR as a form of tourism gains significance. It not only provides a bridge between the limitations imposed by the pandemic and the innate human desire for exploration but also establishes itself as a resilient and adaptable solution for the evolving landscape of the tourism industry. In this environment of continued uncertainty, the role of VT gains further prominence as a resilient and adaptable solution to the evolving dynamics of the tourism industry.

The surge in cloud tourism amid the COVID-19 pandemic has been a catalyst for the accelerated momentum of VT, amplified by the metaverse boom in 2021 (Fennell, 2021). This growing trend prompts important questions regarding the sustained popularity of technology and its potential impact on tourists' travel intentions. It also raises broader inquiries about the lasting influence of these virtual experiences on the overall quality of tourism. These questions not only delve into the evolution of technology but also highlight the critical role of consumer groups in driving and shaping its adoption. Some authors insist that after the COVID-19 pandemic will be over VT and real tourism continue co-exist together (Zhang, et al., 2022).

The pivotal query revolves around whether the current fascination with VT is merely a transient phenomenon or if it represents a lasting paradigm shift. Understanding the enduring appeal of technology is crucial in gauging its long-term influence on travel behaviours and preferences. While the initial surge may be attributed to the unique circumstances of the pandemic, sustained interest and continued development suggest a deeper and more lasting impact. Furthermore, assessing the impact of VT on tourists' travel intentions is essential. Does the virtual experience serve as a substitute for physical travel, or does it complement and enhance traditional tourism? Understanding how these virtual encounters resonate with different consumer segments is vital for predicting the technology's role in shaping future travel patterns.

Effectively contributing to the quality of tourism is another key consideration. Beyond being a temporary substitute during restrictions, can VT enhance the overall travel experience? Crucially, these questions underscore the dynamic interplay between technology and consumer behaviour. The trajectory of VT hinges not only on technological advancements but also on the evolving preferences and expectations of diverse consumer groups. Understanding the motivations, desires, and concerns of these groups is essential for tailoring VT experiences that resonate with a broad audience.

In navigating these inquiries, researchers and industry stakeholders play a pivotal role in shaping the future of VT. By exploring the multifaceted dimensions of this technological evolution and its implications for different consumer cohorts, a more nuanced understanding can be gained. This, in turn, will inform strategies for the continued development and integration of VT into the broader landscape of travel experiences.

1.3 Dissertation outline

The present dissertation takes a unique approach to the study of VT, designating it as an independent and distinct form of tourism rather than an integrated component of traditional touristic experiences. Motivated by the unprecedented circumstances of the COVID-19 pandemic, which highlighted the significance of modern technologies, the dissertation delves into the exploration of VT as a standalone product with inherent appeal to potential tourists.

The impetus for this research arises from the distinctive attributes of VT, including its unparalleled uniqueness, utilization of cutting-edge technologies, and demonstrated inclusivity. The pandemic, with its widespread disruptions to conventional travel, underscored the relevance and potential of VT in providing alternative and accessible travel experiences. This inspired the author to investigate the perceptions and preferences of potential tourists regarding VT, particularly examining the willingness of individuals to engage with VT and

discerning its utility for specific segments of the population based on factors such as age and health conditions.

There are three main research questions that the author tried to answer in this dissertation:

- RQ1. How is VR currently utilized in the field of tourism?
- RQ2. Can VT be considered a novel category within the tourism industry?
- RQ3. What is the level of receptivity among individuals towards VT?

The objective is to introduce and conceptualize the novel notion of VT while investigating the willingness of individuals across various age groups and health conditions to engage with this emerging form of tourism, by using focus-group interviews and questionnaires.

The current dissertation consists of nine chapters: Introduction, Literature Review, Materials and Methods, Results and Discussion, Conclusions, Recommendations, Limitations, Future Research, Summary, New Scientific Results, Bibliography, and Appendices.

2. MATERIALS AND METHODS

Within this chapter, a comprehensive examination of the principal objectives and the methodological framework utilized in the present study unfolds, offering an in-depth comprehension of the study's structure and approach.

2.1 Research Objectives

Objective 1: Unveiling VR Applications in Tourism.

The primary goal of this objective is to illuminate the diverse applications of VR within the tourism industry. Through an exhaustive literature review and analysis, current research aims to discern the multifaceted ways in which VR technologies are currently integrated into various facets of tourism.

- RQ1. How is VR currently utilized in the field of tourism?
- RQ1.1 What are the existing applications of VR in the tourism industry?
- RQ1.2 How do businesses and tourists leverage VR technologies for enhanced tourism experiences?

- H1. VR is employed in diverse ways across the tourism industry.
- H1.1 Various applications demonstrate the versatility of VR in enhancing tourism experiences.

Objective 2: Exploring the Concept of VT.

This objective involves a meticulous exploration of the emergence of VT as a distinct paradigm within the broader spectrum of tourism. By scrutinizing existing VR applications, current research seeks to identify foundational elements contributing to the conceptualization of VT.

- RQ2. Can VT be considered a novel category within the tourism industry?
- RQ2.1 What defines VT as a unique form of tourism?
- RQ2.2 How does VT differ from traditional tourism experiences?

- H2. VR serves as the foundation for VT.
- H2.1 Non-immersive VR technologies form the basis for the emergence of VT.
- H2.2 Semi-immersive VR technologies form the basis for the emergence of VT.
- H2.3 Fully immersive VR technologies form the basis for the emergence of VT.

Objective 3: Assessing Tourist Receptivity to VT.

This objective revolves around investigating the receptivity of different segments of tourists towards VT. Particular emphasis is placed on understanding whether individuals with motor disabilities exhibit a distinctive inclination towards embracing VT experiences.

- RQ3. What is the level of receptivity among individuals towards VT?
- RQ3.1 What factors influence people's willingness to embrace VT?
- RQ3.2 Are there demographic variations in the acceptance of VT?

- H3. Receptivity towards VT varies among different types of tourists.
- H3.1 Younger generation ("Generation Z") exhibit higher receptivity towards VT, considering wide range of new technology usage within the generation.
- H3.2 Middle generations ("Generation Y") exhibit higher receptivity towards VT, considering its potential to address accessibility challenges.
- H3.3 Older generation ("Generation X") exhibit higher receptivity towards VT, considering its potential to address accessibility challenges.
- H3.4 Individuals with motor disabilities exhibit higher receptivity towards VT, considering its potential to address accessibility challenges.

Figure 15 serves as a concise summary of the overarching objectives, specific research questions, and testable hypotheses formulated to guide the current research.

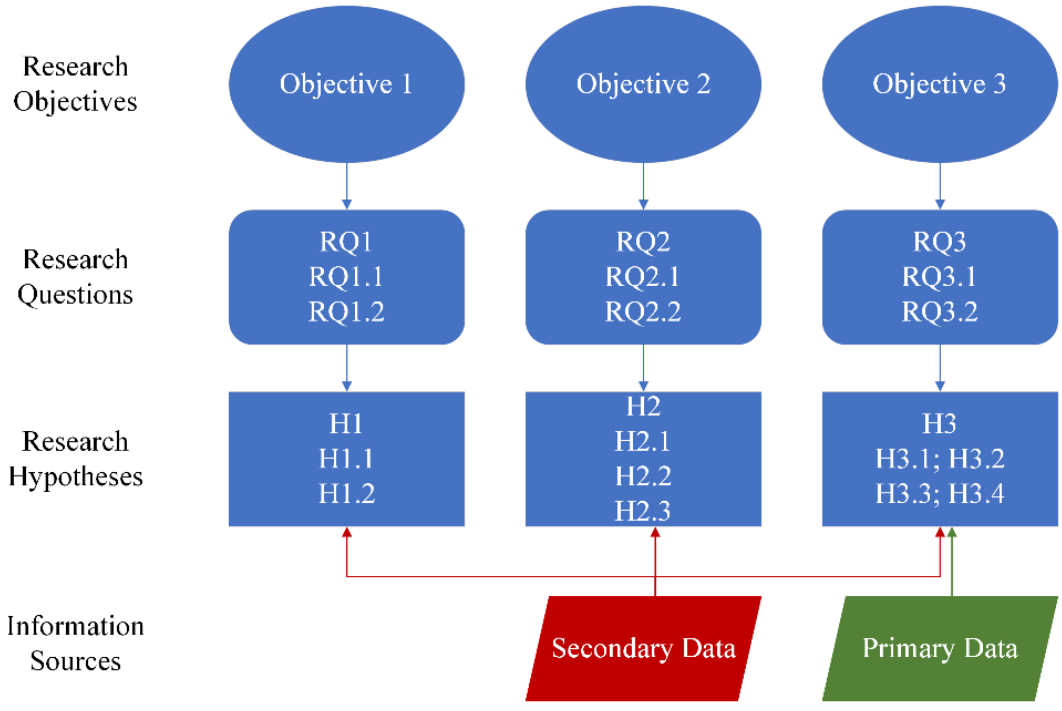

Figure 1: Research Summary
Source: own work

2.1.1 Research gap and contribution

Tourism industry has witnessed the integration of VR technologies, yet there remains a discernible gap in understanding the full spectrum of possibilities and implications associated with the emergence of VT. Existing literature offers insights into the applications of VR in tourism, acknowledging its potential to enhance user experiences. However, the gap arises in the comprehensive exploration of whether VT can be recognized as a distinct category within the broader tourism paradigm.

This dissertation aims to bridge this gap by systematically investigating the multifaceted relationship between VR and tourism, proposing that VR could serve as the foundational technology for the evolution of VT. While some studies have touched upon the use of VR in specific tourism applications, there is a lack of in-depth analysis regarding its potential to redefine the very nature of tourism experiences.

The proposed hypotheses lay the groundwork for exploring the diversity of VR applications in tourism, elucidating the transformative potential of VR in shaping VT. Furthermore, the examination of receptivity towards VT among different segments of tourists, including those with motor disabilities, adds an inclusive dimension to the research.

The confirmation of these hypotheses would contribute to filling the research gap by providing a nuanced understanding of how VR is currently employed in tourism, the conceptualization of VT as a distinctive form of tourism, and the factors influencing individual receptivity towards this innovative paradigm. This research endeavours to advance the theoretical foundations of tourism studies and offer practical insights for industry stakeholders seeking to capitalize on the evolving virtual experiences in tourism.

2.2 Data Collection

2.2.1 Secondary Data

In this dissertation, secondary data for analysis were sourced from reputable scientific platforms, namely "Web of Science," "Scopus," and "Google Scholar," in addition to scholarly journals, books, and electronic resources. The dataset also included information gathered from official websites of companies specializing in VR products or services, relevant blogs, and video interviews. In the comprehensive literature review conducted for this dissertation, a total

of 357 sources were employed. More than half of these sources comprised scientific journal articles, with additional contributions from categories such as "Web site," "Book," and "Conference Proceedings." The detailed distribution of sources from the current research is visually presented in Figure 16.

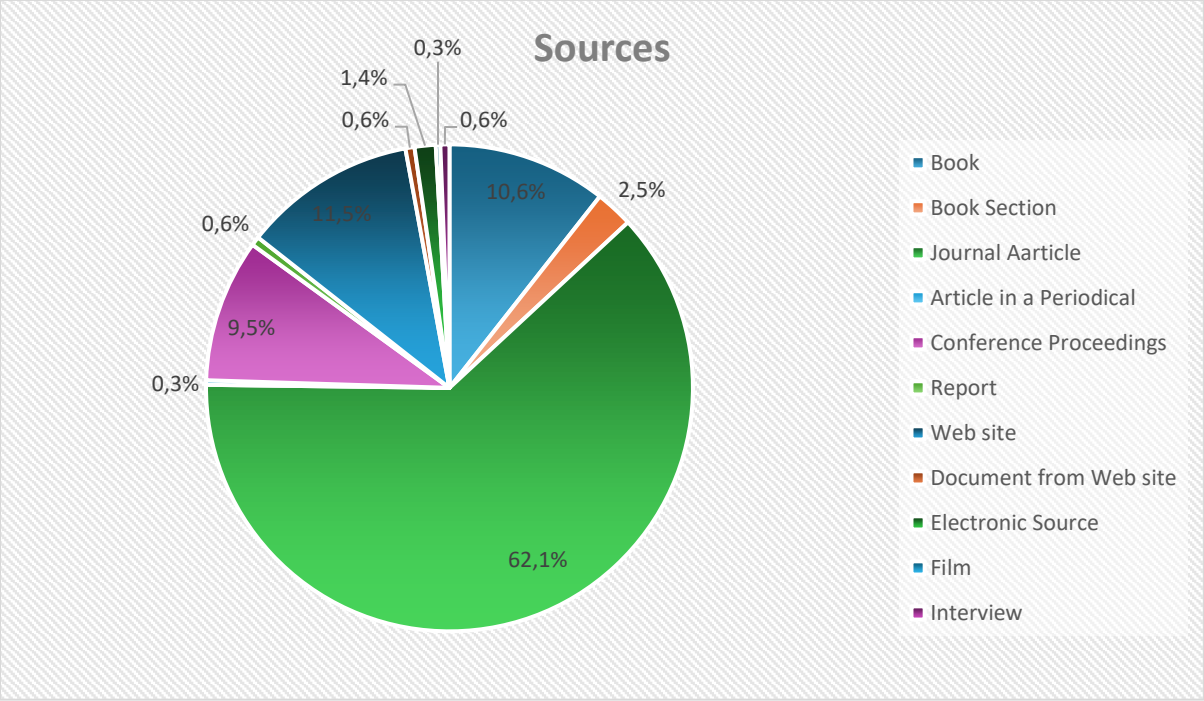

Figure 2: Source distribution used in dissertation
Source: own work

To conduct a comprehensive analysis of the VT literature retrieved from the WoS, a systematic method was employed. This method was chosen to ensure a thorough and organized examination of the available literature, providing a robust foundation for the subsequent chapters of the dissertation.

2.2.2 Primary Data

In the primary data analysis, a mixed method was employed, encompassing both qualitative and quantitative research approaches. Qualitative research was conducted through a focus-group interview and open-ended questions in the questionnaire, offering insights into participants' perceptions of VT, its advantages, and disadvantages.

I. Focus-group Interview

A focus-group interview was chosen for its effectiveness in eliciting genuine opinions, fostering open discussions, and generating new ideas. The focus group allowed for a nuanced exploration of participants' views on VT without the constraints of multiple-choice questions.

In the primary data research phase, focus group interviews served as a valuable method to glean insights into the perceptions of potential tourists who were not professionally aligned with tourism and were unfamiliar with current virtual trends in this industry.

The focus-group interview was structured as an open discussion, initiated by the interviewer providing a clear definition of VT ("Virtual Tourism is a process of immersing people in the virtual environment by using various gadgets (VR helmet, gloves, smell and test sensors, etc.") to ensure participants had a common understanding relevant to the research. Each group, comprising five individuals, engaged in discussions for approximately an hour. Throughout the session, the interviewer periodically introduced prepared topics to guide the conversation, including:

1. Identify potential users of VT.
2. Explore the advantages associated with VT.
3. Discuss the drawbacks or limitations of VT.
4. Brainstorming strategies for enhancing the popularity of VT.

In total, 20 people participated in the focus-group interview. They were divided into four groups by five people each. All of the participants belonged to the 20s–30s age group and were intentionally selected from Gen Y and Gen Z, as their technological literacy and openness to progress were deemed critical for understanding their perspectives on VT, and were referred to as "digital native" (Palfrey & Gasser, 2010), compared to older generations. The focus group interviews took place in April 2024, took about an hour, and became a base for formulating survey questions.

II. Survey

Quantitative research was conducted through an online questionnaire that was created based on the results of the focus-group interview. To ensure accessibility and minimize errors, the questionnaire featured a user-friendly interface, simple language, and explanations of specific terminology. Google Forms was chosen as the survey platform for its ease of use, accessibility across devices, and intuitive design. The program facilitated data collection and analysis, allowing for the download of responses in various formats.

The survey encompassed 20 questions strategically categorized into three main sections:

1. Touristic Behaviour: understanding participants' travel patterns before and after the COVID-19 pandemic.
2. Awareness and Experience: exploring participants' awareness and experience with VR in tourism, along with their opinions on VT.

3. Demographic Data: Collecting information on age group, nationality, income level, and status to assess potential influences on participants' perspectives.

The questionnaire was disseminated via the Internet to maximize outreach and engage a broader participant base, aligning to obtain a representative and diverse sample. The data collection took place in April 2023 and December 2023. The utilization of an online platform facilitated ease of access for respondents, allowing them to complete the survey at their convenience. This methodological choice also facilitated the integration of data obtained from participants with varying degrees of familiarity with VT, thereby enriching the overall dataset. The strategic design of the survey questions sought to elicit nuanced responses, providing valuable insights into the intricate interplay between participants' travel habits, their perceptions of VR technology, and demographic factors that might influence their viewpoints. The comprehensive nature of the questionnaire aimed to capture a holistic understanding of individuals' attitudes toward VT, laying the foundation for a nuanced analysis within the broader context of the dissertation.

The study was conducted bilingually, utilizing both English and Russian languages, to maximize the dataset. This approach facilitated broader participation and ensured that individuals comfortable with either language could contribute their insights. Conducting the study in two languages catered to a more diverse participant base, enabling a comprehensive analysis of responses from individuals with varying linguistic preferences. Additionally, the political restrictions that Russia currently faces affect traveling possibilities for Russian citizens. This can become a potential market segment for VT.

One survey was employed to gather data from individuals both with and without motor disabilities, with the primary divergence occurring in Section 2. This section specifically focused on respondents' awareness of VR and VT, their firsthand experiences with these technologies, and their opinions regarding the utility of VT as a distinct form of tourism.

In the attempt to gather enough respondents with motor disabilities for analysis, the distribution of the questionnaire within common social media groups proved ineffective. To address this challenge, a targeted approach was adopted, focusing on social media platforms dedicated to PwD. Simultaneously, outreach efforts were extended to organizations specifically catering to PwD. The strategy involved reaching out to relevant organizations through email and contact forms available on their websites, leveraging their established platforms for individuals with motor disabilities. A Google search conducted on December 6, 2023, at 3 p.m. CET, with the query “community for people with motor disabilities,” resulted in checking 90 different links globally. Nineteen emails were sent, and contact forms were filled in for 26 organizations. A

subsequent search on December 12, 2023, at 7 a.m. CET, using the Russian query “сообщества для людей с ограниченными возможностями” (translated as "community for people with motor disabilities"), involved checking 80 different links. 28 emails were sent to organizations in post-Soviet countries, and 83 emails were sent to official government organizations across different subjects of the Russian Federation.

However, the obtained feedback was notably low, with several organizations either not responding to emails or facing issues such as outdated or incorrect email addresses. Some responses included requests for additional research details or suggestions to redirect the inquiry to a more suitable organization within their network.

In total, three organizations declined participation, while three organizations agreed to share the questionnaire within their respective platforms. The outcomes of this outreach effort are summarized in Table 13.

Table 1: Feedback from emails
Source: own work

Type of feedback	International	Russian
No feedback	30	102
Error message	4	2
Confirmation message	3	1
Agree to help	1	2
Not agree to help	2	1
Miscellaneous message	5	3

The process of engaging with social media platforms for data collection involved registration, seeking approval to post in relevant groups, and crafting the posts. Distinct steps were taken for Russian-speaking and International English-speaking media. Despite variations in the number of groups and their responsiveness, an integrated analysis was undertaken due to the inability to compare responses between the two linguistic groups. Key insights were derived from three highly effective social media platforms: "Facebook," "Odnoklassniki," and "Vkontakte." Table 14 provides a detailed overview of the outcomes.

Table 2: Feedback from social media platforms
Source: own work

Platform	International (total/approved)	Russian (total/approved)	Number of impressions on the post	Was not approved or was deleted

«Vkontakte[1]»	-	37/11	31	26
«Facebook[2]»	32/18	4/2	38	16
«Odnoklassniki[3]»	-	27/15	7	12
«X[4]»	1	1	18	-
«Telegram[5]»	-	2/1	1	1
«LinkedIn[6]»	1	-	32	-
Forums for PwD	2/1	1/1	20	1

On "Facebook," although only half of the communities accepted the questionnaire post, those that did boasted a combined follower count exceeding 37,000. However, the posts generated limited engagement, with only 38 impressions.

On "Odnoklassniki," nearly half of the communities removed the questionnaire post, and one even banned the profile. The remaining approved groups had a collective follower count exceeding 21,000, but the posts received only 7 impressions.

"Vkontakte" featured numerous communities for PwD, but a third of them either removed the post, did not approve it, or ignored administrator messages. The approved groups had a total follower count of 13,500, and the posts garnered 31 impressions.

Other utilized social media platforms did not yield significant results for the current research. The posts were disseminated in December 2023, and the results were aggregated in February 2024, providing a two-month window for survey participation.

While online surveys offered cost-efficient and global reach, potential drawbacks included a lack of control over the sample, limited population diversity, and uncertainties regarding participant engagement. The snowballing sample principle was leveraged to encourage participants to share the survey with their networks.

ANOVA Analysis.

To determine whether there is a significant variation in the means of the groups being compared or if the differences observed could have occurred by chance. ANOVA allows to assess the

[1] Vkontakte is a Russian online social media and networking service, often compared to Facebook. It allows users to create profiles, connect with friends, share multimedia content, and join communities.

[2] Facebook is a widely used global social networking platform. Users can create personal profiles, connect with friends and family, share text and multimedia content, and engage with others through comments and likes.

[3] Odnoklassniki is a Russian social network that focuses on connecting classmates and old friends. It provides features for sharing photos, updates, and communication with classmates.

[4] X is a microblogging and social networking platform that allows users to share short messages. Users can express thoughts, opinions, or share links and multimedia content within a character limit.

[5] Telegram is a cloud-based instant messaging app that prioritizes privacy and security. Users can send messages, multimedia files, and create groups or channels.

[6] LinkedIn is a professional networking platform. It is used for building professional connections, sharing work-related updates, and networking within industries.

impact of categorical independent variables (factors) on a continuous dependent variable, identifying which factors, if any, have a significant effect on the outcome variable.

This analysis was used for two aspects: different generations familiarity with VR and VT. Respondents were classified into distinct age groups and generations based on the options provided in the survey. These options included age ranges such as less than 18, 18-24, 25-33, 36-50, and more than 50. Specifically, individuals selecting less than 18 and 18-24 were categorized as Gen Z, those within the 25-33 range were identified as Gen Y, while respondents falling within the 36-50 and more than 50 categories were designated as Gen X. Statistical analysis was conducted by using ANOVA analysis via DATAtab (DATAtab Team, 2024). First step was to test the normal distribution. Table 15 shows the results of four different statistical tests used to assess whether your data follows a normal distribution. A high p-value (greater than 0.05) suggests that the data does not significantly deviate from normality. All four tests indicate that your data do deviate significantly from the normal distribution. This means that you should proceed with statistical methods that do not assume normality of the data.

Table 3:Normality Distribution Tests of the sample
Source: own work

Normality distribution tests	Familiarity with VR		Familiarity with VT	
	Statistics	p	Statistics	p
Kolmogorov-Smirnov	0.33	<.001	0.26	<.001
Kolmogorov-Smirnov (Lilliefors Corr.)	0.33	<.001	0.26	<.001
Shapiro-Wilk	0.79	<.001	0.79	<.001
Anderson-Darling	37.29	<.001	33.37	<.001

As a next step, data was analysed by using following calculations:

- Frequency indicates the number of respondents in each age group who provided data on their familiarity with VR.
- Mean indicates the average familiarity score for each age group.
- Std. Deviation measures the dispersion or variability of the familiarity scores within each age group.
- Variance represents the spread of data points around the mean.
- 95% Confidence Interval for Mean provides a range within which the true population mean of familiarity with VR is estimated to lie with 95% confidence.

This analysis lays the groundwork for further investigation into the factors influencing VR and VT adoption among different generations, contributing to a deeper understanding of technology acceptance and usage patterns.

3. RESULTS AND DISCUSSION

The goal of the Results and Discussion chapter is to present and interpret the findings of the research study. This chapter begins by presenting the raw data collected during the study in the form of tables, charts, and graphs. Following the presentation of the results, the discussion section interprets the findings. The author analyze the data, identify patterns or trends, and compare the results with existing literature. This chapter aims to provide insights, explanations, and implications of the findings, addressing any unexpected outcomes or discrepancies. It also discusses the significance of the results, their theoretical and practical implications, and potential avenues for future research. Overall, the Results and Discussion chapter is crucial for understanding the meaning and relevance of the study's findings within the broader academic and practical contexts. Consequently, this study endeavors to address the research questions, and this section delineates the study's design, methodology, and offers an analysis of the gathered data.

4.1 Focus-group Interview

The focus group interview commenced with a succinct introduction to the concept of VT, providing participants with a foundational understanding. The ensuing discussion was both dynamic and multifaceted, with each participant presenting distinctive viewpoints and considerations related to the potential adoption of VT.

4.1.1 Group 1

Man 1 (22 y.o., Morocco, student) emerged as an active contributor to the conversation, proposing numerous positive scenarios for the VT application. From envisioning a reduction in the reliance on traditional zoos to the immersive experience of historical events, he displayed a keen interest in the transformative possibilities of VT. Additionally, he delved into the realm of interpersonal relationships, suggesting VT as a tool for long-distance couples to virtually travel together. Notably, he raised important concerns regarding cybersecurity and the actual level of relaxation that users might experience during virtual travel, offering valuable insights that contribute to the ongoing discourse on VT.

Man 2 (21 y.o., Jordan, student), leveraging his experience with VR, expressed reservations about potential medical contraindications and the legal intricacies surrounding the functioning of VT. His apprehensions extended to the readiness of individuals for a transformative change, emphasizing the need for an effective marketing campaign to propel the popularity of VT.

Man 3 (26 y.o., Jordan, employee) played a pivotal role as a mediator within the group, acknowledging the validity of opinions presented by both Man 1 and Man 2. He underscored

the notion that VT may cater to different individuals and stages of development, asserting that it need not be a constant choice but a tool for specific, perhaps urgent, experiences.

Woman 1 (22 y.o., Russia, student), while maintaining a more reserved stance, contributed thoughts on safety within VT simulations. She highlighted the absence of physical threats within VE while expressing reservations about potential sanitization in the representation of destinations.

Woman 2 (25 y.o., Russia, student) delved into the sustainability aspect of VT, emphasizing its potential to reduce the carbon footprint associated with traditional travel. Her insights extended to the inclusivity of VT, providing opportunities for individuals with health or financial constraints to engage in travel experiences. She emphasized the ability of VT to cover a diverse array of attractions in a single virtual trip.

Despite the varying perspectives presented within the group, a common thread emerged: all participants expressed a willingness to experiment with VT before forming definitive opinions. This collective openness to exploring the potential benefits and drawbacks of VT showcased a dynamic and receptive attitude within the focus group. The nuanced and multifaceted nature of the discussion provided a rich tapestry of insights, contributing to a comprehensive understanding of public attitudes toward VT within different demographic segments.

4.1.2 Group 2

Man 1 (30 y.o., Korea, employee, business owner) sees VT as suitable for those who want to visit many places in a short time. He pointed out the convenience of exploring places without time constraints or physical limitations are the advantages of VT. However, he assumes that not being able to feel the real environment is a disadvantage. He recommended targeting seniors as a potential audience for VT.

Woman 1 (31 y.o., Hungary, employee) believes that VT is suitable for anyone who lacks the resources or ability to travel physically. Being able to customize experiences and avoid unpleasant aspects of travel are the advantages of VT, but she feels like virtual experience will lack authenticity in experiencing local cultural aspects. She recommends marketing VT as a cost-effective and convenient alternative for traditional traveling.

Woman 2 (23 y.o., Slovakia, student/employee) recognizes the potential of VT for PwD and, at the same time, as a cost-saving and time-saving option. She agrees with Woman 1 in her disbelieve that VT can provide an authentic cultural experience. She suggests integrating VT into educational settings.

Woman 3 (22 y.o., Hungary, student/employee) views VT as accessible to anyone, but particularly beneficial for PwD. Her concerns were focused on the accessibility of VR, because of its high price, and the possible negative impact on the economy of local communities at the real destinations.

Woman 4 (22 y.o., Hungary, student) also emphasizes the inclusivity of VT for PwD, just like Woman 2 and Woman 3. She doubts that the multisensory experience is possible to digitalize. She recommended to increase awareness of people about VT and boost their interest for a successful implimitation of VT.

Overall, while there is recognition of the potential benefits of VT, such as accessibility and cost-effectiveness, there are also concerns about its limitations in providing authentic experiences and its impact on traditional tourism economies.

4.1.3 Group 3

Woman 1 (27 y.o., Hungary, employee) believes that VT is accessible to anyone with the necessary technology, regardless of demographics. She pointed out that VT is accessible, affordable, and can be customized for individuals' interests. At the same time, she doubted that the virtual experience could be similar to real sensory perceptions. She recommended raising awareness of people about the VT.

Woman 2 (23 y.o., Jordan, student) agreed with Woman 1 and considered anyone with internet access as a potential user of VT. She viewed VT as a cost-free travel experience. Just like Woman 1, she doubts the technological ability of VT to provide a multisensory experience.

Woman 3 (27 y.o., Jordan, employee) suggested that PwD can be a target market for VT. She mentioned that VT is a means to escape daily routines and disconnect from reality. She also agreed with previous interviwees in VT not being able to recreate multisensory experience.

Woman 4 (31 y.o., Jordan, employee) suggested that VT is suitable for individuals unable to travel because of the various reasons (financial, health conditions, etc.). Her main concern about VT was its possible negative impact on local communities economics. She recommended targeting a specific segment that can be satisfied with the VT provided experience.

Woman 5 (21 y.o., Kazakhstan, unemployed) identified PwD, budget-conscious individuals, and the elderly as potential users of VT. She expressed that affordability, time-saving, and stress-free exploration are the advantages of VT compared to traditional traveling. The disadvantage is the lack of social interactions during VT. She recommended to focus on educational initiatives to promote VT.

Overall, while there's a recognition of the benefits of VT in terms of accessibility and cost-saving, there are also concerns about its limitations in replicating real travel experiences and its potential impact on traditional tourism economies. Effective marketing, affordability, and creative implementation strategies emerge as common themes in making VT more popular and widely accepted.

4.1.4 Group 4

Woman 1 (27 y.o., Russia, student) identified PwD and people with financial constraints as potential users of VT. She did not mention any advantages of VT but highlighted the lack of interaction with local culture and the absence of physical experiences as a disadvantage. She suggested making VT more immersive with features like sound effects, AI-based conversations, and providing local food recipes to make it more immersive.

Woman 2 (27 y.o., Russia, employee) agreed with Woman 1 on the potential users of VT and added that it also can be used during events and for kids as an entertaining tool. She acknowledged the advantage of VT in providing access to destinations that are not available during traditional traveling. However, she pointed out the inability of VT to evoke the same emotions as real travel experiences. She suggested raising people awareness of VT via Internet promotion and integrating it into educational system.

Woman 3 (25 y.o., Indonesia, employee) suggested that anybody who wants to use VT can be a target group. She acknowledged the accessibility, affordability, convenience, safety, and educational value of VT. However, she mentioned that lack of authenticity, limited sensory immersion, technological barriers, and social isolation are disadvantages of VT. Collaboration with the government and DMOs can lead to a successful implementation of VT without negative effect on the destination.

Woman 4 (25 y.o., Laos, employee) agreed that anyone can use VT, but especially those who cannot travel because of the different limitations. She emphasizes the ability of VT offer near realistic experience, however, cost, accessibility issues, and complexity of use of such technology, especially for the elderly can be a disadvantage. She suggested providing free trials of VT experience to raise people's awareness.

Man 1 (27 y.o., Russia, employee) agreed that anyone can use VT, but focused on PwD. He agreed with Woman 2 and acknowledged that VT can provide access to destinations that are not available for traditional traveling. The number of additional gadgets needed for successful implementation of VT made it less accessible and affordable. According to him, raising the awareness of VT is a key to its success.

Overall, the participants recognized the potential of VT to cater to diverse user groups but also acknowledged the need for improvements in its accessibility, affordability, and immersive qualities to maximize its benefits.

4.2 Questionnaire

4.2.1 Demographic Analysis

The survey, conducted in both April and December of 2023, garnered a total of 356 responses. A demographic breakdown revealed a predominant representation of female participants, with the majority falling within the age groups of 25-35 (37.9%) and 18-24 (34.8%). Nearly 60% of respondents identified as students, possibly influenced by the author's student status and the survey's initial dissemination among the author's social circle. Monthly income among participants varied, with the majority falling within the range of 500€ to 1000€. Most of the respondents do not have motor disability, and less than 10% of the respondents have it. A comprehensive analysis of demographics data is presented in Table 16, offering detailed insights into the diverse characteristics of the survey participants.

Table 4: Demographic Analysis
Source: own work

Category	**Criteria**	**Total = 356**	
		n	**%**
Gender	Male	109	30.6
	Female	243	68.3
	Prefer not to say	4	1.1
Age-group	Less than 18	3	0.8
	18 – 24	124	34.8
	25 – 35	135	37.9
	36 – 50	68	19.1
	More than 50	26	7.4
Marital status	I am single	162	45.5
	I have a partner	114	32
	I am married	80	22.5
Children	Yes	81	22.8
	No	275	77.2
Status	Student	208	58.4
	Part-time job	63	17.7
	Full-time job	93	26.1
	Unemployed	17	4.8
	Pensioner	17	4.8
	Other	20	5.6
	Less than 500€	95	26.7

Monthly income	500€ - 1000€	113	31.8
	1000€ - 2000€	61	17.1
	2000€ - 3000€	22	6.2
	More than 3000€	20	5.6
	Prefer not to say	45	12.6

To enhance the inclusivity of the survey and amass a broader range of responses, the questionnaire was translated into Russian, allowing for distribution in Russia and among Russian-speaking communities in post-Soviet countries. The author's proficiency in Russian facilitated this translation process.

Survey participants hailed from 64 countries, with significant representation from Russia (15.7%), Hungary (13.5%), and the UK (12.9%). The availability of the questionnaire in Russian contributed to the higher response rate from Russian speakers. The international distribution strategy, particularly within Hungarian communities, was supported by the author's residency in Hungary. Figure 17 provides a visual representation of the global distribution of survey participants, with darker shades indicating higher response concentrations. Notably, eight respondents opted not to disclose their location.

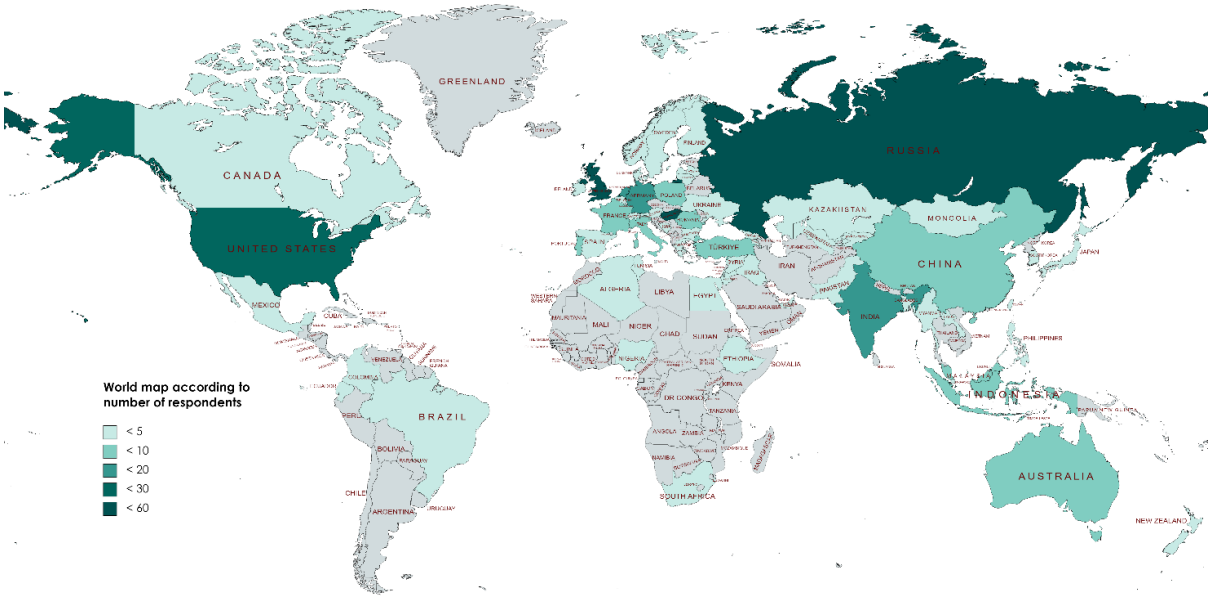

Figure 3: World map according to number of respondents
Source: own work

4.2.2 Travelling habits analysis

The analysis of data from Section 1 sheds light on the pre-COVID-19 travel patterns of the respondents. This side-by-side comparison highlights the disparities in travel frequencies between respondents without disabilities and those with motor disabilities. Individuals with motor disabilities tend to travel less frequently, with a higher percentage (37%) indicating traveling less than once a year compared to respondents without disabilities (17.3%). The biggest amount of these indicated traveling 2-3 times a year (38.3%). Conversely, a smaller percentage of individuals with motor disabilities (3.7%) reported traveling more than three times a year compared to those without disabilities (17%). This information underscores the impact of motor disabilities on travel behaviour. More detailed information is represented in Table 17.

Table 5: Comparative analysis of pre-COVID-19 traveling habits among participants with and without motor disabilities
Source: own work

Category	**People without motor disability (Total=329)**		**People with motor disability (Total=27)**		**Total = 356**	
	n	**%**	**N**	**%**	**n**	**%**
Less than once a year	57	37.3	10	37	67	18.8
Once a year	90	27.4	9	33.4	99	27.8
2-3 times a year	126	38.3	7	25.9	133	37.4
More than 3 times a year	56	17	1	3.7	57	16

The analysis of respondent preferences regarding the type of travel reveals divergent patterns based on disability status. Participants without disabilities displayed a preference for international travel, with 69.6% indicating a propensity for journeys abroad, while only 30.4% favoured domestic travel. Conversely, respondents with disabilities exhibited a strong inclination towards domestic travel, with 70.4% expressing a preference for local destinations, while 29.6% favoured international travel. A potential explanation for this disparity lies in the variations observed in the monthly income of the two groups, as detailed in Table 1. The economic considerations tied to income differences may contribute to the distinct travel preferences, where individuals with disabilities, potentially facing financial constraints, show a higher preference for cost-effective domestic travel options. At the same time, Individuals with disabilities might encounter challenges related to transportation. International travel often

involves various modes of transportation, including flights, which may pose accessibility issues for people with disabilities. Finally, people with disabilities may have specific health considerations that make domestic travel more manageable. Access to familiar healthcare facilities and a more controlled environment might be prioritized over navigating unfamiliar healthcare systems during international travel. Opting for domestic travel could be a more accessible and convenient choice for PwD.

Respondents could choose only one option that helped to identify the most important purpose of traveling. The list was created according to UN, which includes leisure, visiting friends and relatives, education, health, religion, and business, with an additional blank field where people could mention their own reason (UN, 2010).

Table 18 depicts the primary purposes of travel for individuals both with and without disabilities, revealing distinct patterns in their preferences. Among people without disabilities "leisure" is the most prevalent purpose, chosen by 74.2% of respondents, and "visiting friends and relatives" was elected by 18.2% of respondents. "Education" was identified by 3.7% of respondents. Among PwD "leisure" remains a significant purpose, selected by 55.6% of respondents, "health and medical care" was highlighted by 14.8% of respondents.

Table 6: Comparison of Travel Purposes Between Individuals With and Without Disabilities
Source: own work

Category	People without motor disability (Total=329)		People with motor disability (Total=27)		Total = 356	
	n	%	n	%	n	%
Leisure	244	74.2	15	55.6	259	72.7
Visiting friends and relatives	60	18.2	1	3.7	61	17.1
Education	12	3.7	-	-	12	3.4
Health and medical care	6	1.8	4	14.8	10	2.8
Religion	2	0.6	-	-	2	0.6
Business	1	0.3	1	3.7	2	0.6
Other	4	1.2	6	22.2	10	2.8

It is evident that leisure is a predominant travel purpose for both groups, although it holds greater importance for individuals without disabilities. Health and medical care emerge as a more significant factor for individuals with disabilities, underscoring the importance of healthcare considerations in travel decisions for this demographic. Additionally, business-related travel appears more frequently among individuals with disabilities than those without.

This nuanced understanding of travel purposes is crucial for tailoring VT experiences to diverse needs and preferences, acknowledging that certain motivations may not be fully addressed by virtual alternatives.

The dissertation discusses the suitability of VT for creating virtual tours in specific locations, particularly in areas like the city center of Budapest that tourists can explore within a few hours. The focus is on the potential of VT for educational cultural tourism due to its ease of production. To gauge people's interest in such tours, an additional question was incorporated to ascertain whether respondents would be inclined to participate in a city tour during their regular travels. The results indicate the general interest level, with most respondents (53.4%) expressing interest in a short city tour, prioritizing it if they have sufficient time, while a smaller percentage consider it a top priority (34.6%). The least number of respondents showed no interest at all (12%).

The dissertation explores how VT provides a condensed version of the travel experience, focusing on sightseeing and eliminating the need for transportation, accommodation, and catering. This shift results in a gradual reduction in the length of the trip. Analysis of the respondents' typical travel durations indicates that the majority prefer trips lasting up to one week, with the smallest percentage opting for trips exceeding two weeks. Figure 18 details these findings.

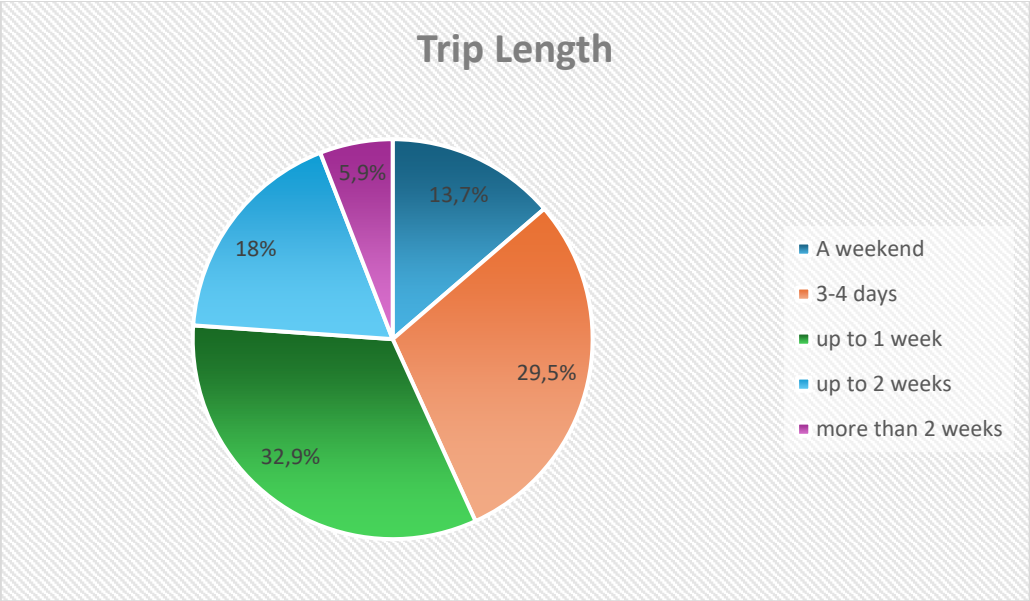

Figure 4: Respondents' trip length
Source: own work

An essential characteristic to consider is the amount of money individuals are willing to spend on their typical trip per person, given that VT offers a potentially more cost-effective

alternative. The analysis of the gathered data indicates that most respondents typically spend between 100€-300€ and 300€-600€. Conversely, the fewest respondents allocate more than 1000€ per person for their trips. Detailed results can be found in Figure 19.

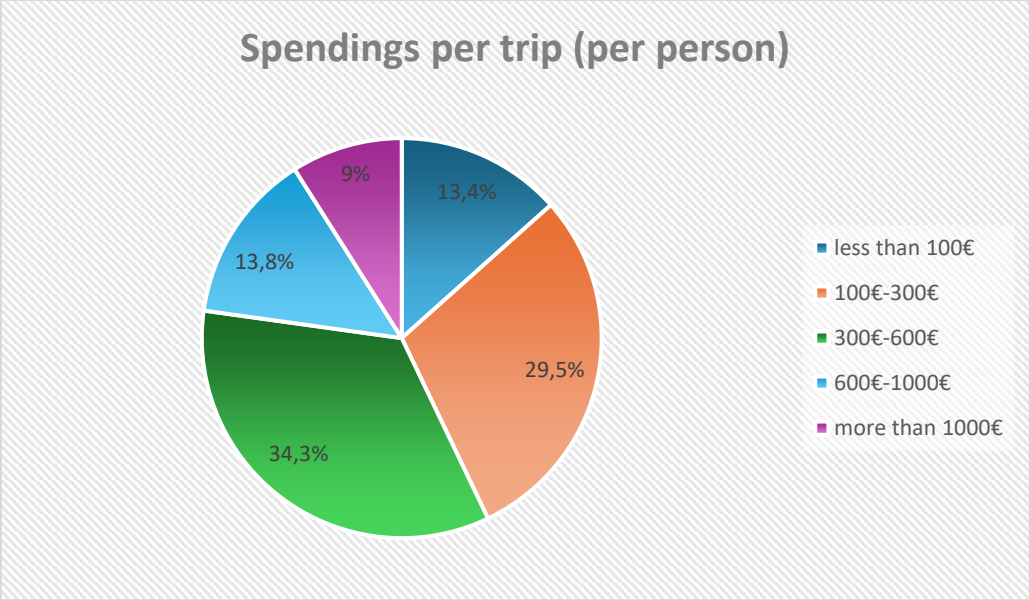

Figure 5: Respondents' spendings per person during the trip
Source: own work

The preferred type of travel organization is crucial in understanding people's openness to utilizing VT, as different organizational approaches may impact their choices. From the outset, VT can be implemented through specialized VT agencies offering various sensors and high-quality gadgets. According to the results, respondents primarily favour planning their trips independently (77.5%). While numerous resources facilitate the booking of essential elements for traditional tours, certain constraints like language barriers, complicated visa procedures, and a lack of experience can pose challenges for some travellers. 19.1% of respondents use both: organized and independent way of traveling, and the least amount (3.4%) prefer to organize their trip by using services of travel agencies.

4.2.3 Familiarity with VR and VT

The analysis of Section 2 in the questionnaire aimed to uncover participants' familiarity with VR, its application in tourism, and their opinions about VT. Table 19 illustrates the answers on question "Are you familiar with VR?" As a result, 20% of the participants were not familiar with it. Among those familiar with VR, only 17% reported its occasional or frequent usage. Most of respondents, both with and without disabilities, are aware of VR and its applications

in tourism but do not actively use it themselves. The results indicate no significant differences between the two groups.

Table 7: Comparison of VR usage patterns between individuals with and without motor disabilities
Source: own work

Category	**People without motor disability (Total=329)**		**People with motor disability (Total=27)**		**Total = 356**	
	n	%	n	%	n	%
"Yes, I use it often"	8	2.4	1	3.7	9	2.5
"Yes, I use it occasionally"	47	14.3	5	18.5	52	14.6
"Yes, but I don't use it"	212	64.4	12	44.4	224	62.9
"No, I haven't used it"	62	18.9	9	33.3	71	20

Analysis also unveiled variations associated with the age groups of the respondents. Figure 5 highlights an interesting trend where older participants tend to use VR more frequently, both often and occasionally. Paradoxically, the same older demographic demonstrates a lower overall awareness of VR, suggesting that Gen X has the highest number of respondents who are unaware of VR. Despite this lack of general awareness, Gen X also boasts the highest number of respondents who actively engage with VR technology.

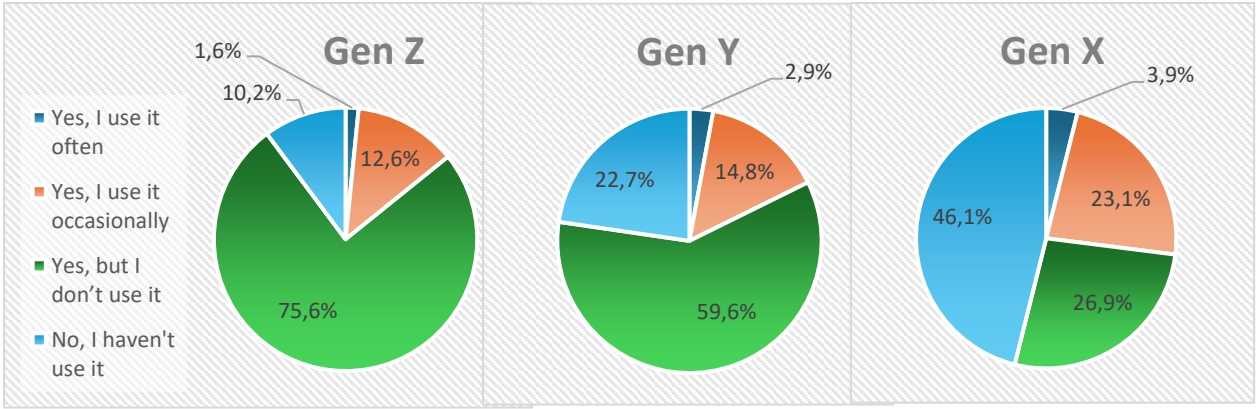

Figure 6: Comparison of different age-groups' awareness of VR
Source: own work

The results of the ANOVA analysis support the statement above and provide descriptive statistics for the familiarity with VR across these groups. They are represented in the Table 20 and described as following:

- Mean. Gen X has the highest mean familiarity score of 3.05, followed by Gen Y with a mean of 3.02, and Gen Z with a mean of 2.94.
- Std. Deviation. Gen X has the highest standard deviation of 0.83, indicating greater variability in familiarity scores among respondents in that group.
- Variance. Gen X also has the highest variance, suggesting wider variability in familiarity scores compared to the other age groups

Table 8: ANOVA analysis of different generations familiarity with VR
Source: own work

		Frequency	Mean	Std. Deviation	Variance	95% Confidence interval for mean
Familiarity with VR	Gen X	94	3.05	0.83	0.7	2.88 - 3.22
	Gen Y	135	3.02	0.65	0.42	2.91 - 3.13
	Gen Z	127	2.94	0.54	0.29	2.85 - 3.04

The data in Table 21 illustrates responses to the question "Have you ever seen how VR is used in tourism (for marketing, management, as an attraction, etc.)?" Among the participants, 37% reported that they had never heard of VR being used in tourism, while only 13% indicated that they had tried it themselves. Most respondents demonstrated awareness of VT but had not personally engaged with the technology. The results of both: respondents with and without disabilities are similar, however, there is a much higher percentage of PwD who tried VT themselves, meaning they are already more interested in VT thanks to it inclusivity. This awareness bodes well for the implementation of VT, as familiarity often precedes adoption. The bigger percentage of PwithoutD never heard of VR being used in tourism.

Table 9: Comparison of familiarity and experience with VR used in tourism between people with and without motor disabilities
Source: own work

Category	**People without motor disability (Total=329)**		**People with motor disability (Total=27)**		**Total = 356**	
	n	**%**	**n**	**%**	**n**	**%**
“Yes, I tried it myself”	41	12.5	8	29.6	49	13.8
“Yes, but I haven’t tried it”	164	49.8	11	40.8	175	49.1
“No, never heard of it”	124	37.7	8	29.6	132	37.1

Discrepancies in the age-group analysis exhibited consistent outcomes across all three generations. An intriguing observation is that a larger percentage of Generation Z is aware of VR applications in tourism, while a greater number of individuals who have actually used it belong to Generation X. The detailed results are illustrated in Figure 21.

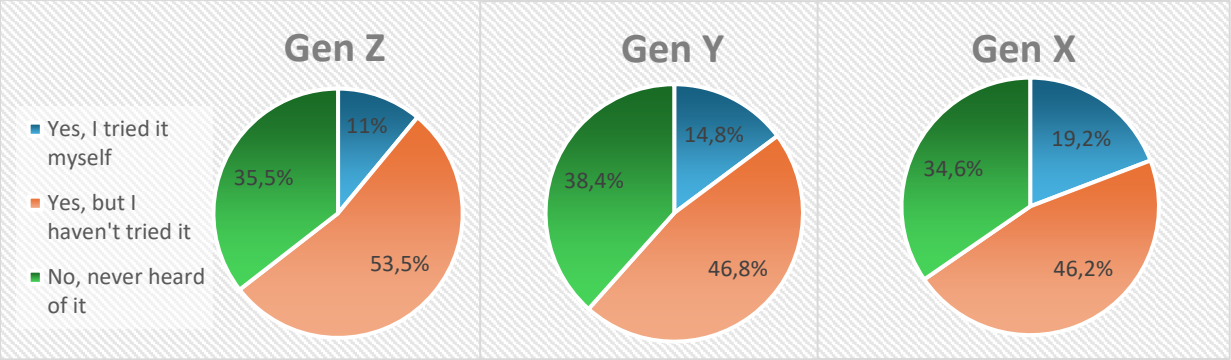

Figure 7: Comparison of different age-groups' awareness of VR used in tourism
Source: own work

The results of the ANOVA analysis support the statement above and provide descriptive statistics for the familiarity with VR across these groups. They are represented in the Table 22 and described as following

- Mean. Gen Y has the highest mean familiarity score (2.3), followed by Gen Z (2.24) and Gen X (2.14).
- Std. Deviation. Gen X exhibits the highest standard deviation (0.73), indicating greater variability in familiarity scores compared to Gen Y (0.67) and Gen Z (0.64).
- Variance. Gen X has the highest variance (0.53), indicating the widest spread of familiarity scores, followed by Gen Y (0.45) and Gen Z (0.41)

Table 10: ANOVA analysis of different generations familiarity with VT
Source: own work

		Frequency	Mean	Std. Deviation	Variance	95% Confidence interval for mean
Familiarity with VT	Gen X	94	2.14	0.73	0.53	1.99 - 2.29
	Gen Y	135	2.3	0.67	0.45	2.18 - 2.41
	Gen Z	127	2.24	0.64	0.41	2.13 - 2.36

The evaluation of potential users' awareness and attitudes towards VT in comparison to traditional tourism was conducted using a six-point Likert scale. This scale lacks a neutral option, what makes respondents choose the more suitable option for them, and Table 23

presents the participants' responses, with the number of votes for each option. The most popular option in each row is highlighted in yellow, while the least popular one is underlined. To facilitate a clearer comparison between the two groups, their results are juxtaposed and color-coded differently: yellow highlight demonstrates the highest score, and the lowest score is underlined.

Table 11: Likert scale results comparison between people with and without disability
Source: own work

	Category	strongly disagree	disagree	slightly disagree	slightly agree	agree	strongly agree
VT is cheaper	PwithoutD[7]	18	22	44	63	121	61
	PwD	3	3	4	3	8	6
VT is easier to plan and arrange	PwithoutD	11	13	37	78	128	62
	PwD	2	4	4	4	8	5
VT allows people to travel to places that are difficult to reach	PwithoutD	11	14	25	50	125	104
	PwD	2	3	5	1	8	8
VT allows people to travel to places that do not exist	PwithoutD	20	16	23	43	112	115
	PwD	2	3	5	2	8	7
VT is safer	PwithoutD	15	20	36	72	111	75
	PwD	3	3	3	3	9	6
VT is more sustainable	PwithoutD	23	25	45	74	106	56
	PwD	3	3	3	4	8	6
VT is more inclusive	PwithoutD	29	37	52	55	94	62
	PwD	2	4	3	4	7	7
There are no technologies that can recreate real experience	PwithoutD	18	23	31	37	56	164
	PwD	3	4	5	3	6	6

To analyze the received data and gain deeper insights into respondents' perceptions, key statistical measures were employed. The mean, median, and mode were calculated for each statement to assess the central tendency of the responses, while standard deviation was computed to gauge the variability in participants' viewpoints. The following formulas were utilized in this analysis:

- Mean provides an average value, offering an overview of the central tendency in respondents' opinions.
    - Mean = (sum of all responses)/(total number of respondents) (Field, 2013).

[7] People without disability

- Median identifies the central position, especially valuable for understanding the distribution of responses.
    - Median is the middle value of the responses when the data are arranged in order from lowest to highest (Allen & Yen, 1979).
- Mode highlights the most common viewpoint expressed by participants.
    - Mode represents the most common response (Agresti & Finlay, 2012).
- Standard deviation (St. Dev.) indicates the degree of variability or dispersion in respondents' opinions around the mean.
    - St. Dev. = sqrt((sum of (response-mean)^2)/(total number of respondents - 1) (Tabachnick & Fidell, 2012).

Detailed results of the Likert Scale analysis after the calculations are presented in Table 24 and described below.

Table 12: Likert Scale data analysis
Source: own work

	Category	Mean	Median	Mode	St. Dev.
VT is cheaper	PwithoutD	49.0	44.0	61.0	29.5
	PwD	4.3	3.5	6.0	1.4
VT is easier to plan and arrange	PwithoutD	56.2	62.0	44.0	27.4
	PwD	4.3	4.5	5.0	1.6
VT allows people to travel to places that are difficult to reach	PwithoutD	60.2	62.0	125.0	28.7
	PwD	4.8	5.0	8.0	2.5
VT allows people to travel to places that do not exist	PwithoutD	68.7	75.0	112.0	32.1
	PwD	4.7	5.0	7.0	2.3
VT is safer	PwithoutD	58.7	72.0	75.0	28.3
	PwD	5.0	6.0	6.0	2.1
VT is more sustainable	PwithoutD	51.7	45.0	56.0	22.1
	PwD	5.7	6.0	6.0	3.3
VT is more inclusive	PwithoutD	42.4	37.0	52.0	15.4
	PwD	5.1	4.0	7.0	1.8
There are no technologies that can recreate real experience	PwithoutD	46.6	37.0	164.0	39.7
	PwD	5.4	4.0	6.0	1.6

1. “VT is cheaper”.

For PwithoutD, the data suggests a relatively positive perception, with an average mean of 49.0, a median of 44.0, and a mode of 61.0. The standard deviation of 29.5 indicates a considerable spread in responses, signifying diverse opinions within this group.

Conversely, PwD demonstrated a lower average mean of 4.3, a median of 3.5, and a mode of 6.0, suggesting a less favourable perception of VT being a cost-effective option. The standard deviation of 1.4 implies a more concentrated distribution of responses among individuals with disabilities.

The comparison between the two groups reveals a substantial difference in means, medians, and modes, indicating a clear contrast in perceptions. People without disabilities, on average, exhibit a more positive view regarding the cost-effectiveness of VT.

2. "VT is easier to plan and arrange".

For PwithoutD, the data reveals a generally positive perception, with an average mean of 56.2, a median of 62.0, and a mode of 44.0. The standard deviation of 27.4 suggests a significant range in responses, indicating diverse opinions within this group.

In contrast, PwD showed a slightly lower average mean of 4.3, a median of 4.5, and a mode of 5.0, suggesting a less favourable perception of VT being easier to plan and arrange. The standard deviation of 1.6 implies a more concentrated distribution of responses among individuals with disabilities.

The comparison between the two groups reveals a substantial difference in means, medians, and modes, indicating a clear contrast in perceptions. People without disabilities, on average, exhibit a more positive view regarding the ease of planning and arranging VT.

3. "VT allows people to travel to places that are difficult to reach".

For PwithoutD, the data suggests a generally positive perception, with an average mean of 60.2, a median of 62.0, and a mode of 125.0. The standard deviation of 28.7 indicates a wide range of responses, reflecting diverse opinions within this group.

Conversely, PwD displayed a slightly lower average mean of 4.8, a median of 5.0, and a mode of 8.0, indicating a less favourable perception of VT's ability to facilitate travel to difficult-to-reach places. The standard deviation of 2.5 suggests a more concentrated distribution of responses among individuals with disabilities.

Comparing the two groups reveals a notable difference in means, medians, and modes, highlighting a distinct contrast in perceptions. People without disabilities, on average, hold a more positive view regarding the capability of VT to enable travel to challenging destinations.

4. "VT allows people to travel to places that do not exist".

For PwithoutD, the data suggests a predominantly positive perception, with an average mean of 68.7, a median of 75.0, and a mode of 112.0. The standard deviation of 32.1 indicates a wide range of responses, reflecting diverse opinions within this group.

Conversely, PwD displayed a slightly lower average mean of 4.7, a median of 5.0, and a mode of 7.0, indicating a less favourable perception of VT's ability to facilitate travel to non-existent places. The standard deviation of 2.3 suggests a more concentrated distribution of responses among individuals with disabilities.

Comparing the two groups reveals a notable difference in means, medians, and modes, highlighting a distinct contrast in perceptions. People without disabilities, on average, hold a more positive view regarding the capability of VT to enable travel to imaginary or non-existent places.

5. "VT is safer".

For PwithoutD, the data suggests a generally positive perception, with an average mean of 58.7, a median of 72.0, and a mode of 75.0. The standard deviation of 28.3 indicates a wide range of responses, reflecting diverse opinions within this group.

Conversely, PwD displayed a similar positive perception with an average mean of 5.0, a median of 6.0, and a mode of 6.0, indicating an overall favourable view of VT as a safer alternative. The standard deviation of 2.1 suggests a more concentrated distribution of responses among individuals with disabilities.

Comparing the two groups reveals a notable difference in means, medians, and modes, highlighting a distinct contrast in perceptions. People without disabilities, on average, hold a more positive view regarding the safety of VT.

6. "VT is more sustainable".

For PwithoutD, the data indicates a generally positive perception of VT's sustainability, with an average mean of 51.7, a median of 45.0, and a mode of 56.0. The standard deviation of 22.1 suggests a considerable range of responses within this group, reflecting diverse opinions on the sustainability of VT.

On the other hand, PwD also displayed a positive perception, with an average mean of 5.7, a median of 6.0, and a mode of 6.0, indicating an overall favourable view of VT as a sustainable option. The standard deviation of 3.3 suggests a more concentrated distribution of responses among individuals with disabilities.

Comparing the two groups reveals some differences in means, medians, and modes, signifying varying perceptions of sustainability in VT. People without disabilities, on average, hold a slightly more positive view regarding the sustainability of VT.

7. "VT is more inclusive".

For PwithoutD, the data suggests a generally positive perception of VT's inclusivity, with an average mean of 42.4, a median of 37.0, and a mode of 52.0. The standard deviation of 15.4

indicates a moderate level of variability in responses within this group, reflecting diverse opinions on the inclusivity of VT.

Similarly, PwD displayed a positive perception, with an average mean of 5.1, a median of 4.0, and a mode of 7.0, indicating an overall favourable view of VT as a more inclusive option. The standard deviation of 1.8 suggests a more concentrated distribution of responses among individuals with disabilities.

Comparing the two groups reveals some differences in means, medians, and modes, signifying varying perceptions of inclusivity in VT. People without disabilities, on average, hold a slightly more positive view regarding the inclusivity of VT.

8. "There are no technologies that can recreate real experience".

For PwithoutD, the data suggests a diverse range of opinions, with an average mean of 46.6, a median of 37.0, and a mode of 164.0. The higher standard deviation of 39.7 indicates a considerable level of variability in responses within this group, reflecting contrasting views on the capability of technologies to recreate real experiences.

PwD, on the other hand, displayed a more concentrated distribution of responses, with an average mean of 5.4, a median of 4.0, and a mode of 6.0. The lower standard deviation of 1.6 suggests a more consistent view among individuals with disabilities, indicating that they generally agree that technologies can recreate real experiences.

Comparing the two groups reveals substantial differences in means, medians, and modes, signifying contrasting beliefs about the potential of technologies to replicate real experiences. People without disabilities, on average, hold a more skeptical view regarding the limitations of current technologies in recreating real experiences.

In essence, the overall sentiments gleaned from the responses are positive. Participants predominantly recognize the benefits offered by VT, with positive affirmations across various dimensions. However, a notable point of hesitation emerges concerning the technological capabilities of current systems. Participants harbor skepticism regarding the ability of existing technologies, within their knowledge scope, to authentically replicate genuine travel experiences. This underscores a key aspect for consideration and further exploration in the development and refinement of VT technologies.

In the following open-ended question, respondents were allowed to provide qualitative insights into their opinions on VT. Out of the 329 respondents without disabilities, 96 provided comments. After filtering out 9 meaningless comments, a total of 87 comments were deemed suitable for future analysis. PwD left 9 comments, all of which were included in the analysis.

The comments were predominantly in English, with 12 written in Russian. Obtained results can be divided into three categories:

Supportive:

- Some respondents endorsed VT, emphasizing its utility for individuals with health issues, including PwD and the elderly, who may face challenges with traditional travel (e.g. “I think it's a good way of tourism for people who aren't able to reach certain places themselves” and “Wonderful for old people”).
- Highlighted cases where VT serves as a valuable alternative for exploring unusual or inaccessible destinations (e.g. “I would opt for the virtual tourism if the real life option is completely out of reach due to health or income issues (example: space travel)” and “VR can extend the discovering, e.g. show the ancient condition in case of ruins”).

Critical:

- Those against VT explicitly stated that, personally, virtual experiences cannot replace real-world encounters (e.g. “For me it won’t work. No smell, no taste, no local weather, no spontaneity” and “It has some advantages but I am not sure that it is for me”).
- Some respondents acknowledged the potential in VT but expressed reservations, citing the perceived insufficiency in current technological development (e.g. “Really cool, but nothing beats in person experience. Only so much technology can do at the moment” and “… if you want to really travel you won't get the full experience through a VR set. VR is a developing part of tech, it's not decent enough now …”).

The cautiousness towards VT, particularly among those without disabilities, may be attributed to its novelty and a low familiarity among respondents. This aligns with consumer behaviour theory, where a small percentage of consumers are willing to try a new product immediately (Pankruhin, 2005).

The comparison between individuals with and without disabilities adds depth to the exploration of attitudes toward VT, revealing unique considerations and reservations within these distinct groups.

Similarities:

- Both groups exhibited mixed opinions on VT, with a range of attitudes from skepticism to appreciation.
- Concerns were raised in both groups about VT's ability to replace authentic travel experiences.

Differences:

- Concerns expressed by individuals without disabilities often revolved around sensory limitations.
- People with disabilities identified VT as a potential alternative for specific needs, emphasizing its utility for health-related or accessibility challenges.

Such qualitative feedback enriches the dissertation's analysis, providing real-world perspectives on VT. It emphasizes the need for a nuanced understanding of individual preferences, acknowledging that perceptions of VT are shaped by personal experiences and technological readiness. Received feedback from forums and comments from under the posts on social media supports these results.

Table 25 provides statistical insights into respondents' willingness to engage with VT if given the opportunity. Over half of the respondents express an openness to trying VT, with only 20% indicating a reluctance to try it at all. Notably, the data reveals variations in responses between individuals with and without disabilities. PwD exhibit a higher willingness to actively use VT (44.4%), while those without disabilities seem more inclined to consider trying it without a firm commitment (57.4%). This discrepancy may be attributed to the greater familiarity of PwD with VR applications in tourism, positioning them as potential adopters of VT.

Table 13: Comparison of respondents' willingness to use VT
Source: own work

Category	**People without motor disability (Total=329)**		**People with motor disability (Total=27)**		**Total = 356**	
	n	**%**	**n**	**%**	**n**	**%**
Yes	71	21.5	12	44.4	83	23.3
Try once	189	57.4	10	37	199	55.9
No	69	21	5	18.5	74	20.8

Additionally, the results indicate that most of respondents perceive VT as potentially useful for PwD (85.2%).

At present, despite the considerable attention given to VR and its accessibility, it is evident that the mass consumer is not fully prepared to embrace this form of tourism as a complete substitute for real-life experiences. Nevertheless, a notable portion of respondents acknowledge the potential advantages and enhancements that this technology could bring to specific segments of tourists and the broader tourism industry.

4.3 Discussion

In this section, some aspects of the conducted research will be compared to existing studies to emphasize their similarities, and differences and compare the results.

4.3.1 Systematic Review Comparison

During the analysis of articles from WoS, four articles were identified that conduct a systematic review of the literature with a similar topic, specifically addressing the application of virtual technologies in the tourism industry. It's important to note that these articles, although sharing a common theme, differ from the systematic review presented in the current research. The distinctions may include variations in the scope of the review, the selection criteria, or the specific focus within the broader realm of virtual technologies in tourism. The features of each research including current research are presented in Table 26.

Table 14: The comparison existing articles with systematic reviews
Source: own work

Source	Sample size	Type of papers	Database	Keywords
(Yung & Khoo-Lattimore, 2019)	46	VR- and AR- related articles in tourism journals	Scopus, EBSCO, Elsevier, Proquest, Emerald	augmented realit*, virtual realit*, virtual world*, virtual environ*
(Akhtar, et al., 2021)	60	Digital technologies and tourism	Scopus and WoS	digital tourism, digital technologies, virtual travel, virtual reality and tourism, augmented reality and tourism
(Fan, et al., 2022)	65	The validity of AR/VR presence in different experimental contexts and different demographic contexts	WoS, EBSCO, Science Direct	(augmented reality, virtual reality) AND (tourism, tourism environment, virtual tourism, attractions, destination marketing, hospitality)
(Calisto & Sarkar, 2024)	54	VR application in tourism and hospitality	WoS	1. augmented reality, virtual reality, virtual touris*, mixed reality; 2. touris*, hospitality, hotel*, destination marketing.
Current Research	54	Virtual Tourism	WoS	virtual tourism

Research of Yung and Khoo-Lattimore (2019) that involves 46 articles related to VR and AR in the field of tourism. The review focuses on articles published in tourism journals and includes five databases. The search criteria for relevant articles involve specific keywords that include variations to cover different aspects of VR and AR in titles, keywords, and abstracts.

The study of Akhtar et al. (2021) focuses on digital technologies in the context of tourism, particularly exploring aspects related to virtual travel, VR, AR, and digital tourism. Articles were retrieved from two main sources using specified keywords to identify relevant papers for their study or review.

The systematic review of Fan et al. (2022) focuses on assessing the validity of AR and VR presence in various experimental and demographic contexts within the field of tourism. The researchers conducted searches in three databases using specific keywords related to AR, VR, and various aspects of tourism.

Calisto and Sarkar (2024) conducted a systematic review to map and analyze existing research on VR applications in (T&H). Two sets of search terms were employed, covering VR-related terms and T&H-related terms, including emerging concepts like "mixed reality" (MR). The search focused on titles, abstracts, and keywords, without applying a specific timeframe.

In contrast to the studies discussed, my research uniquely concentrates on a more specific application within the broader field of VR – VT. While the other studies encompassed AR, MR, and XR applications, my research deliberately focused solely on VR as the pivotal component for achieving fully immersive VT experiences. This targeted focus is reflected in the choice of a specific keyword, "virtual tourism," employed in the literature search, ensuring a more precise and relevant selection of articles.

Despite the shared emphasis on the quality of articles over quantity, with each study prioritizing peer-reviewed articles from reputable databases, the distinction lies in the specificity of application and the corresponding choice of keywords. This deliberate narrowing of focus contributes to the uniqueness of my research within the collective landscape of VR and AR studies in the field of tourism.

Additionally, only my research used RStudio for literature analysis, other articles used other programs (such as SPSS) or did not use them at all.

4.3.2 Primary Data Analysis Comparison

The current dissertation employs a survey methodology to gather primary data on the application of VR in tourism and VT. This approach aligns with the practices of other researchers who have utilized surveys for similar purposes since the 2000s. Table 27 presents

a comparative analysis of various aspects across these studies, focusing on articles that solely employed survey methodologies without providing a demonstration of the VT experiences themselves. Table 27 contains nine suitable articles and current research as well.

Table 15: Comparison of articles with similar approach to mine
Source: own work

The study	**Sample**	**Sample size**	**Aware of VT**	**VT Technology**	**Likert Scale**	**Advantages of VT**	**Disadvantages of VT**
(Sussmann & Vanhegan, 2000)	General public and professionals in tourism; UK	50	16%	N/A	7-point	Experience the destination before booking	Not actually experiencing the real thing
(Korinth, et al., 2019)	General public; Poland and foreigners	250	66.3 %	Google Street App	N/A	N/A	N/A
(Roman, et al., 2022)	General public; Poland	564	82%	VR 3d environment	N/A	The use of VR is important at the time of the COVID-19 pandemic	Tourism with VR cannot substitute for traveling in the real world
(Shoaib, et al., 2022)	General public	534	69.1 %	N/A	N/A	Safety and security	Lack of change of environment
(Mavrin, et al., 2022)	General public; Croatia	228	N/A	VR/AR/XR use in tourism	5-point	VR/AR/XR and video games can contribute to virtual revival of lost historical sights.	N/A
(Li, et al., 2022)	General public with and without VT experience; China	239	100%	N/A	5-point	Easy to use	There is still a theoretical path of the enjoyment of tourists in VT that has not been

							achieved in the industry
(Geng, et al., 2023)	Elderly (65+); South Korea.	412	N/A	Semi-immersive VR	N/A	VR/AR attributes in senior tourism contribute to valuable experiences, positively affecting emotional benefits, enjoyment, and reuse intention	N/A
(Zeqiri, 2023)	General public; Kosovo	674	N/A	N/A	N/A	Authentic experience, enjoyment, and flow experience are crucial for enhanced VT experience	N/A
(Bilynets, et al., 2023)	General public	656	N/A	Semi-immersive VR	7-point	N/A	VT is not seen as a substitute for actual travel
Current Research	General public and PwD	356	62.9 %	Fully-immersive VR	6-point	VT allows people to travel to places that are difficult to reach	There are no technologies that can recreate real experience

In a study conducted by Sussmann and Vanhegan (2000), a questionnaire was administered to both the general public and professionals in tourism in Great Britain. It is noteworthy that my research excluded professionals, focusing solely on comparing results with the general public's responses from their study. Despite methodological differences, the core arguments remained consistent. Both studies emphasized themes such as the opportunity to explore inaccessible places, inclusivity, and the ability to travel to non-existent locations. One striking similarity

was the identification of a common negative effect – the absence of the actual experience of real travel – which was highlighted by respondents in both studies. This enduring consistency in results, spanning two decades, suggests that VT has yet to establish its efficacy among mass consumers.

In their article, Korinth et al. (2019) conducted a study comparing VT awareness among Polish individuals and foreigners. The study aimed to consolidate and summarize their results for comparison with other research. Notably, the authors emphasized the use of the Google Street app as a primary tool for their investigation. It is essential to highlight that in their approach, VT was positioned more as a marketing tool rather than being treated as a distinct and independent form of tourism.

In their article, Roman et al. (2022) gathered the survey respondents focusing on VT awareness among Polish people. The findings indicate a high level of awareness among the respondents. The primary factor influencing the choice of virtual travel is the opportunity to explore inaccessible places. Notably, almost 90% of respondents firmly believe that VR tourism cannot serve as a substitute for real-world travel experiences. The study identifies new technologies, security, and changes prompted by the COVID-19 pandemic as key factors influencing the development of VR in tourism. Interestingly, comfort and accessibility for disabled individuals are not considered significant factors. Additionally, a substantial majority, approximately 70% of respondents, express the importance of using VR during the COVID-19 pandemic.

In their article, Shoaib et al. (2022) provided a comprehensive analysis of respondents' awareness of VT across different generations, encompassing Gen Z, Millennials, Gen X, and Baby Boomers. Like my research, this study revealed a low percentage of individuals who had personally experienced VT. At the same time, it highlighted a significant portion of respondents who expressed a willingness to try VT in the future. This also aligns with the trend observed in my research, indicating a potential interest and openness among diverse age groups to explore VT.

In their article, Marvin et al. (2022) examined travel habits before the COVID-19 pandemic, a similar approach was used in my research. The study identified similar proportions in traveling motives, with leisure and visiting family and friends ranking at the forefront. While there is no specific information about respondents' awareness of VT, the article revealed that 60% of participants believed that VR, AR, and XR could contribute to the touristic presentation. This aligns with the broader theme in my research, indicating a recognition of the potential impact of immersive technologies on the tourism sector.

In the article of Li et al. (2022) participants were exclusively selected based on their awareness of VT and were then compared in terms of experience and non-experience with VT. The research acknowledges the limited popularity of VT at its current stage of development, as indicated by differences in sample counts between potential and actual tourists. TAM was employed for analysis, emphasizing the significance of the expected ease of use as a key determinant. The study identifies significant predictors and emphasizes the need for effective advertising to enhance the popularity of VT. Practical design considerations for VT products are discussed, focusing on simplicity, efficiency, and increased user engagement. This aligns with your research's exploration of VT and the factors influencing its acceptance and usage.

The research of Geng et al. (2023) explores VR and AR attributes in the context of senior tourism. It emphasizes that these attributes contribute to valuable experiences, leading to positive effects on emotional benefits, enjoyment, and reuse intention among elderly individuals. This aligns with my research, which also delves into the application of VT in the tourism sector, providing insights into the experiences and intentions of the senior demographic.

The research of Zeqiri (2023) underscores the importance of authentic experience, enjoyment, and flow experience in enhancing the VT experience. The study highlights the critical role of VT quality, as experiences perceived as inauthentic or unenjoyable may impact user engagement negatively. Specifically, authenticity, particularly in terms of local interactions and culinary experiences, is identified as a key factor influencing the perception of VT as a substitute for physical tourism. The study also reveals that the level of digital skills does not significantly influence the intensity of VT use. The accessibility and simplicity of VT products and services are suggested as factors that may diminish the impact of digital skills on usage intensity. These findings align with my dissertation's exploration of factors influencing the VT experience, particularly emphasizing the role of authenticity and user engagement.

The study of Bilynets et al. (2023) uniquely compares people's willingness to use VT for payment and for free. Participants were randomly assigned to either a paid or free VT experience condition. Among those offered a paid VT experience, 33% agreed to pay and participate, while 83% of those offered a free experience chose to participate. The research found that EE and previous experience with technology did not have the expected effect on the user's intention to use VT. This study provides insights into the economic aspect of VT adoption and how the cost factor influences user willingness, contributing valuable information to your dissertation's exploration of factors influencing VT acceptance.

The studies mentioned utilized questionnaires as their primary data collection method. However, they adopted a different definition of VT, incorporating non-immersive or semi-immersive VR and positioning it as a useful marketing and planning tool. In contrast, my research focuses on presenting VT as a distinct and independent category of tourism, specifically by utilizing fully immersive VR experiences. This approach enhances the novelty and uniqueness of your study, as it delves into the potential of VT as a separate and immersive form of tourism. Additionally, my utilization of a 6-point Likert Scale, which excludes a neutral option, ensures that respondents express a more decisive stance, providing a clearer insight into their preferences and perceptions regarding VT. At the same time, by incorporating the perspectives of PwD, my research contributes to a more inclusive understanding of VT. Previous studies did not focus on VT's inclusivity. This emphasis on inclusivity aligns with broader societal goals of promoting accessibility and equal opportunities for all individuals, including those with motor disabilities. Consequently, my study adds valuable insights to the literature by exploring the potential benefits and challenges of VT for this specific demographic, addressing a notable gap in existing research.

5. CONCLUSIONS, RECCOMMENDATIONS, LIMITATIONS AND FUTURE DIRECTIONS, SUMMARY

This chapter serves to draw overall conclusions from the study, offer practical recommendations based on these conclusions, discuss the limitations of the research, and propose directions for future research.

1. Conclusions summarize the key findings of the study, emphasizing how they address the research objectives or questions. It highlights the main insights gained from the research and their implications for the field of study.

2. Recommendations are based on the conclusions drawn, and this section provides practical suggestions or recommendations for stakeholders, policymakers, or practitioners. These recommendations aim to inform decision-making or guide actions that can address the issues or capitalize on the opportunities identified in the study.

3. Limitations is a part where the author acknowledge and discuss the limitations of the study, including any constraints, biases, or shortcomings that have affected the validity or generalizability of the findings. This section promotes transparency and helps readers interpret the results within the context of the study's limitations.

4. Future Directions outlines potential avenues for future research that build upon the current study. It identifies unanswered questions, areas for further investigation, or methodological improvements that could enhance understanding in the field. By suggesting future directions, researchers contribute to the ongoing advancement of knowledge in the subject area.

Overall, this chapter synthesizes the main outcomes of the study, provides actionable insights, acknowledges its limitations, and offers guidance for future research endeavors.

5.1 Conclusions

The integration of VR into the tourism industry has marked a transformative shift in contemporary society, leading to the emergence of VT. This dissertation explores the multifaceted impact of VR on tourism, addressing key objectives and research questions through a comprehensive mixed-method approach. The findings illuminate the diverse applications of VR in tourism, showcasing its versatility as a planning tool, marketing strategy, and immersive attraction (H1).

The second objective delves into the concept of VT, identifying technological prerequisites for its classification as a unique form of tourism. Non-immersive and semi-immersive VR fall short of providing the authentic travel experience sought by tourists, highlighting the pivotal

role of fully immersive VR in shaping VT (H2.1, H2.2, H2.3). VT emerges as a sustainable, inclusive, and safe alternative, redefining conventional notions of travel.

Objective three investigates the behavior of different respondent groups toward VR in tourism. While individuals with disabilities exhibit higher receptivity to VT (H3.4), the age-group analysis yields nuanced results, emphasizing the need for a more sophisticated research design (H3.1, H3.2, H3.3). The hypotheses are supported or partly supported based on the study's comprehensive analysis.

In summary, the research contributes valuable insights into the potential of VT as a distinct tourism paradigm. Despite challenges and varying receptivity among demographic groups, VT holds promise for revolutionizing the tourism industry. The study concludes by emphasizing the importance of regulatory acceptance and collaboration with global tourism organizations to ensure the responsible integration of VT into mainstream tourism practices.

Table 28 summarizes the hypothses of the dissertation.

Table 16: Result according to hypotheses of the research
Source: own work

Hypotheses	Sub hypotheses	Content	Result
H1	H1.1	Various applications demonstrate the versatility of VR in enhancing tourism experiences	Supported
H2	H2.1	Non-immersive VR technologies form the basis for the emergence of VT	Not supported
	H2.2	Semi-immersive VR technologies form the basis for the emergence of VT	Not supported
	H2.3	Fully immersive VR technologies form the basis for the emergence of VT	Supported
H3	H3.1	Younger generation (“Generation Z”) exhibit higher receptivity towards VT, considering wide range of new technology usage within the generation	Partly supported
	H3.2	Middle generations (“Generation Y”) exhibit higher receptivity towards VT, considering its potential to address accessibility challenges	Partly supported

	H3.3	Older generation ("Generation X") exhibit higher receptivity towards VT, considering its potential to address accessibility challenges	Partly supported
	H3.4	Individuals with motor disabilities exhibit higher receptivity towards VT, considering its potential to address accessibility challenges	Supported

The COVID-19 pandemic ushered in an era of unprecedented challenges for the global tourism industry, with traditional travel experiencing severe constraints. In this context, VT emerged as a potential alternative, capturing the attention of researchers eager to explore innovative solutions amidst the crisis. This period of restricted travel provided a unique opportunity for the development and popularization of VT. Despite the enthusiasm within the academic realm, the reception of VT among tourists and tourism-related enterprises presented a nuanced picture. The industry, grappling with survival concerns during the crisis, had limited bandwidth for innovation. As a result, VT struggled to gain significant attention, facing potential neglect amid the prioritization of immediate survival strategies. The perspectives of tourism industry professionals played a pivotal role in shaping the trajectory of VT. Varied reactions were observed, reflecting a spectrum of viewpoints. While some professionals recognized the potential of VT and embraced its integration as a viable solution, others perceived it as a threat, potentially disrupting traditional tourism practices, and rejected its implementation. This dichotomy in reactions highlights the delicate balance between innovation and the preservation of established industry norms. Survival imperatives during the crisis may have overshadowed the exploration of novel avenues such as VT. As the industry stabilizes post-pandemic, there is an opportunity for a reassessment of VT's potential and its integration into broader tourism strategies.

To conclude, VT possesses the capacity to revolutionize the tourism industry, as elucidated by our study, which provides valuable insights into its merits and limitations. The findings suggest that VT can offer a distinctive and accessible alternative to physical tourism, particularly for individuals encountering physical or financial constraints.

5.2 Recommendations

This section elucidates the practical steps taken to implement our research findings, particularly focusing on the creation of VT as a distinct form of tourism. The details outlined herein serve

as a guide for future endeavours in establishing VT as a viable and independent facet within the tourism industry.

A systematic approach to data collection was fundamental to unravelling valuable insights and gauging the impact of VR on the tourism industry, specifically delving into people's perceptions of VT. Employing a mixed-method strategy, the research incorporated both qualitative and quantitative techniques.

A focus group interview was conducted to delve deeper into participants' qualitative perceptions of VT as a distinct form of tourism. This interactive session facilitated open discussions, allowing participants to express nuanced opinions and experiences related to VT. The qualitative data gathered enriched our understanding of the intricacies surrounding VT.

Quantitative data collection was executed through an online questionnaire, meticulously designed to extract specific insights into respondents' opinions on VT, taking into consideration their health condition. This structured approach ensured a systematic analysis of participants' perspectives, enabling statistical inferences on the broader acceptance and potential challenges of VT within the tourism landscape.

In the context of my research, ethical considerations centered on the voluntary nature of survey participation and the absence of personal information collection. By design, the study prioritized the protection of participants' rights, privacy, and confidentiality, adhering to ethical standards.

The research findings underscored discernible variations in the perspectives of distinct tourist segments based on age and health conditions. These insights can be instrumental for local governments, DMOs, and businesses for offering valuable input for the development and promotion of virtual attractions. This approach aims to preserve existing attractions, provide access to destinations unable to accommodate physical visitors, and create entirely new and distinctive virtual offerings.

Theoretically, leveraging current technologies allows for the creation of a fully immersive environment simulating real travel experiences by engaging all five senses: visual input through glasses or 360-degree view screens, auditory stimuli via headphones or speakers, olfactory and gustatory sensations using sensors, and tactile feedback through gloves, all within climate-controlled rooms. This holistic approach promises a unique travel encounter, eliminating the necessity for physical travel while mitigating potential negative factors associated with real experiences.

Considering technological advancements, global travel organizations are urged to reevaluate the conventional definition of "tourism" in alignment with suggestions from the scientific

community. Recognizing VT as a distinct form necessitates regulatory considerations, paving the way for elevated standards in virtual experiences without adversely impacting the local community's economic dynamics.

5.3 Limitations and Future Research

My research encountered certain limitations that should be acknowledged to provide a comprehensive understanding of the study's context and potential constraints.

- Political Situations.

The political climate in the world, particularly, in Russia and Palestine introduced additional challenges to my study. Emotional constraints stemming from ongoing conflicts in these regions affected the researcher’s working schedule and ability to focus on the study, what increased the time needed to conclude the dissertation.

- Geographic Restrictions.

The constrained access to Russia due to geopolitical factors significantly impacted the execution of more intricate investigations and collaboration with local stakeholders. The sanctions imposed against Russia presented challenges in terms of travel, limiting the researcher's ability to conduct on-the-ground studies.

- Email Domain.

The sanctions imposed had a notable impact on source accessibility. When in Russia, foreign sources were unreachable, and similarly, while in Hungary, Russian sources remained inaccessible. This led to the unavailability of certain sources, necessitating the use of additional tools such as VPNs. Moreover, assistance from third parties, including friends, relatives, and other researchers, became crucial in obtaining the required information.

- Participant Cooperation.

Despite our efforts to ensure a diverse participant pool, some individuals exhibited a reluctance to fill out the survey, which impacted the overall response rate. This reluctance may stem from various factors, including time constraints, disinterest, or privacy concerns.

The identified factors have introduced constraints that influenced both the depth and breadth of this study. It is crucial to acknowledge these limitations for a nuanced interpretation of the research outcomes. For future studies, it is recommended to consider these constraints when building upon this work, aiming for a more comprehensive and inclusive exploration of VT in diverse contexts.

- Lack of relevant data.

Due to the absence of pertinent data, it is impossible to analyze the impact of VT on actual tourism destinations, economical situation and local communities as it does not exist in a form current research proposes. Simultaneously, there's a scarcity of comprehensive statistical data available globally or on a country-specific level regarding individuals with motor disabilities. This limitation makes it challenging to accurately predict the size of the potential virtual tourism segment comprised of this demographic.

The present research relies on a systematic review based on sources obtained from the WoS. Future research endeavours should explore the possibility of retrieving information from other platforms, such as Scopus, to ensure a more comprehensive literature review.

The sample size of PwD in the current research is relatively small. It is suggested that future research aims to collect a larger number of respondents to obtain more accurate and representative results, particularly in the context of PwD and their engagement with VT.

The primary data collection tool in the current research was a survey. For future research, it is advisable to consider incorporating interviews and experiments in addition to surveys. This multi-method approach can provide more detailed and nuanced results, contributing to a deeper understanding of the research topic.

Future research endeavours could further examine the potential impact of VT on the tourism industry and reveal the best-suited technological equipment. Additionally, to better understand whether VT can be successful using not only VR gadgets but extra sensors as well, my goal is to conduct a series of experiments that will include different groups of tourists with variable traveling experiences. This will help to evaluate the influence of VT compared to real traveling.

5.4 Summary

The dissertation titled "Exploration of Virtual Tourism as an Independent Frontier Affected by COVID-19" employs a mixed-method approach encompassing focus-group interviews, surveys, and a systematic literature review. The primary objective is to investigate potential tourists' inclination toward VT and the influencing factors, including age and health conditions.

The research findings indicate that participants acknowledge the advantages of VT, expressing a willingness to engage in virtual experiences. However, concerns about the technological preparedness of the industry to deliver authentic and realistic encounters are prevalent. The identified benefits, including sustainability, affordability, and inclusivity,

significantly enhance the attractiveness of tourist destinations, fostering community involvement.

The study suggests that these favorable aspects could pave the way for the establishment of a new tourism paradigm – VT. However, widespread acceptance by governments and global tourism organizations is crucial for the formulation of regulations governing this emerging sector.

In conclusion, the study not only addresses its research questions but also opens avenues for future research on the evolving landscape of VT, its societal implications, and the continuous refinement of virtual experiences to meet the evolving expectations of diverse tourist segments. The research contributes substantially to the understanding of integrating VT into tourism practices, particularly for PwD. The dissertation concludes by addressing limitations, discussing implications, and proposing avenues for future research, all centered around the concept of crafting a unique virtual experience using modern technologies.

6. NEW SCIENTIFIC RESULTS

The chapter on new scientific results presents several key contributions to the field of community-based tourism, particularly in the realm of VT and its implications for inclusivity, accessibility, and sustainability.

Firstly, a systematic review of existing literature reveals a gap in understanding the willingness of PwD to engage with VT. This study addresses this gap by uncovering unique results that reveal their awareness of VR usage in tourism and willingness to use VT, emphasizing its potential as an inclusive and accessible form of tourism.

Furthermore, utilizing RStudio analysis of the database from WoS, that highlights current trends in the scientific society towards VT.

Moreover, the scientific outcomes derived from this research make a substantive contribution to the realm of community-based tourism by underscoring the importance and practicality of inclusivity, accessibility, and sustainability through the development of a virtual form of tourism utilizing advanced VR technologies. The study establishes that these elements play pivotal roles in influencing people's inclination to embrace VT, thereby enhancing the overall travel experience, positively impacting the destination, and contributing to the improvement of local community living conditions, along with fostering effective risk mitigation management during emergencies.

In addition, by categorizing potential tourists across different generations and health conditions and focusing on the utilization of fully immersive VR technologies, this research constructs a comprehensive framework for the conceptualization and implementation of VT as an independent type of tourism. The findings illuminate that the integration of VR in tourism not only aids DMOs and local governments in planning and marketing but also facilitates the creation of authentic attractions, thereby fostering tourism that is more inclusive, accessible, and sustainable for both tourists and local communities.

Lastly, the research outcomes underscore the imperative of collaborative efforts among global tourism organizations, local governments, DMOs, and the business sector to establish an operational framework for VT. This collaborative approach is essential for presenting realistic tourism experiences within VE without adversely impacting the economic well-being of the destination.

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