Rethinking Consumerism, Innovation and Tourism Sustainability in a Post-Viral World: An Exploratory Study of PIRT Usage in Niagara's Geoparks

Abigail Mensah

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Faculty of Social Sciences, Brock University
St. Catharines, Ontario

ABSTRACT

Tourism resilience in the face of a prevailing pandemic and accompanying global uncertainties remains a concern to many stakeholders. A key area of interest for the industry regards the pandemic's potential to influence change in people's consumption patterns, possibly towards more sustainable, ethical, safe and technologically mediated forms of tourism. Such pandemic-induced attitudinal changes can, in turn, affect how tourism will be consumed in future. These changes may further translate into the need for new exchange relationships, tourism experiences, resources, and innovations to aid interactions between service providers (tour guides), tourists and destinations.

With the advent of technology-driven solutions for normalization during the pandemic, some studies have predicted shifts from traditional long-haul travels to virtual tourism as they are considered to be a safer, accessible, and ecologically friendly form of tourism. This exploratory research, therefore, sought to unearth the influence of Covid-19 on Millennial students' preferences for virtual tours in the aftermath of the pandemic. The objectives were to identify factors that can influence intentions for change in people's tourism preferences based on their experience of the pandemic, to explore tourist perceptions about the potential of virtual tour innovations like PIRTs to meet their future preferences, and to investigate how this connection can translate into prospective models in Niagara's geopark tourism sector.

Quantitative data was collected from 117 sampled students in the Brock University community through an online questionnaire. The findings revealed that financial, experiential, and ecological concerns are significant factors which will possibly influence

Millennials' travel patterns and their inclination to use PIRTS in the post-Covid era. Based on these findings, suggestions are made on how smart tourism innovations such as PIRTs can be harnessed as resilient alternatives to conventional tourism in Niagara Peninsula Aspiring Global Geopark (NPAGG) destinations to promote socio-ecological wellbeing in the region.

Key Words: Consumption, Covid-19, Virtual tourism Innovation, Sustainability, Niagara Peninsula Aspiring Global Geopark

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"Difficult roads often lead to beautiful destinations. The best is yet to come…." Zig Ziglar

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CCUNESCO – Canadian Commission for UNESCO

CDC – Center for Disease Control

ERRT – Economic Rapid Response Team

FAO - Financial Accountability Office of Ontario

GGN - Global Geoparks Network

IEA - International Energy Agency

IUCN - International Union for the Conservation of Nature

NPAGG – Niagara Peninsula Aspiring Global Geopark

NRNC - Niagara Regional Native Centre

OECD – Organization for Economic Co-Operation and Development

PIRT – Personalized Interactive Real-Time Tours

SDG - Sustainable Development Goals

SES – Socio-Ecological Systems

SPSS - Statistical Package for the Social Science

UGGps - UNESCO Global Geoparks

UNCTAD – United Nations Conference on Trade and Development

UNEP – United Nations Environmental Program

UNESCO - United Nations Educational, Scientific and Cultural Organization

UNWTO – United Nations World Tourism Organization

WCED - World Commission on Environment and Development

WTTC – World Travel and Tourism Council

UN – United Nations

VT – Virtual Tourism

WHO - World Health Organization

CHAPTER 1: INTRODUCTION

1.1 Background to the Study

Sustainability remains a core developmental issue in 21st-century tourism (Saarinen, 2018). This is especially so in the context of the current Covid-19 pandemic, where accompanying global insecurities, chaos in financial markets, and prevailing environmental crises continue to spark calls to restart tourism activities, enhance the industry's resilience, and rethink future sustainability (Gössling et al., 2020; Thompson, 2020). The Coronavirus pandemic has had devastating impacts on industries. Following the outbreak, many enterprises across the globe were confronted with significant risks and losses due to decreased demand for products and services, supply chain interruptions, labour and income cuts, and transportation system disruptions (Bundervoet et al., 2022; Kugler et al., 2021; Nicola et al., 2020; World Development report, 2022). The UNWTO recorded a historical 87% decline in global tourism activities as of March 2021 due to travel restrictions and economic hardships resulting from lockdowns. These are believed to have plummeted tourism levels to those of 30 years ago (UNWTO, 2021a).

During the outbreak, there were global fears that persisting health concerns, travel restrictions, destination closures, and declines in disposable tourist incomes would exacerbate the industry's vulnerability, leading to the further collapse of many tourism-based economies (Gössling et al., 2020). These challenges begged the implement of recovery solutions through global cooperation, the development of innovative technologies, and the general restructuring of business and service delivery processes to ensure sustainability (Brouder et al., 2020; Fennell, 2020).

Yet, despite its adverse impacts on societies, Sigala (2020) argued that the pandemic presented an opportune time to valorize the transformative affordances of Covid-19 and rethink change for more sustainable tourism futures. To many industries across the globe, the pandemic offered a chance to discover and expand the scope of technological innovations to mediate supply chain systems that were disrupted by prolonged emergency and mobility restrictions. Innovations such as humanoid robots for service delivery, safety and security devices, machines for disinfecting or sterilizing public spaces, and devices for

measuring body temperature became a panacea to enduring COVID-19 driven-needs for normalization, surveillance, health, and safety (Sigala, 2020).

For the tourism industry, the emerging role of technological innovations as critical drivers of change and growth cannot be understated (Fennell, 2020; Manyika et al., 2013; Neuhofer et al., 2014). Advocacies particularly highlight the prospects of smart or virtual tourism developments to mediate the pandemic's impacts on systems where close human contact has been affected, to promote the industry's recovery, and to offer advantages of sustainability and resilience (Fennell, 2020; Gretzel et al., 2020; Mair, 2020; Manyika et al., 2014; Neuhofer & Buhalis, 2014; Sigala, 2020).

Virtual tourism (VT) innovations such as the Personalised Interactive Real-time Tour (PIRT) model (Fennell, 2020) have been earmarked to offer benefits of safety and accessibility to tourists. They are also regarded as ethical and responsible alternatives to conventional travel, and are thought to promote entrepreneurship, income generation in destinations, and contribute to the conservation of natural resources (Hughes & Moscardo, 2019). However, since the success of such innovations would depend on their ability to align efficiently with the needs of tourists (Lin & Chen, 2012), identifying tourists' interest in and need for their use is an essential step in the innovation planning process for sustainable tourism.

In the context of the current Covid pandemic, issues around tourism consumption behaviors have attracted the growing interest of researchers. Studies suggest that the advent of technology-driven solutions for normalization accompanying people's limited involvement in social activities could induce changes in future tourism consumption patterns (Chebli & Said, 2020; Higgins-Desbiolles, 2020; Prideaux et al., 2020; Sigala, 2020; Zenker & Kock, 2020). Preferences for ethical, safe, less costly, and technologically mediated forms of tourism have been predicted as potential tourism consumption trends which may be induced by the pandemic.

As digital natives who grew up in the technological era, Millennials continue to experience the transformational consequences of ICTs in both their private and professional lives (Kim & Park, 2020). Influenced by technology from the very early stages of their upbringing, millennials demonstrate solid skills in the use of digital technologies as well as the need for constant connectivity (Ketter, 2019). The sudden switch to

technological solutions as a way to navigate uncertainties of the pandemic is thus anticipated to have profound impacts on Millennials' professional and personal behaviors in the long and short term. Such an impact can significantly affect their consumption habits and tourism behaviors (Clark & Nyaupane, 2022)

In line with the burgeoning interest in the topic, this study seeks to assess how the pandemic could impact the tourism preferences of millennial students in the Brock University Community. The goal is to understand whether virtual tourism innovations like PIRTS can become a preferred tourism form compared to traditional in-person tours for Millennial students in the Niagara region in the aftermath of the pandemic. The Niagara region is currently immersed in a comprehensive planning and development process for creating the Niagara Peninsula Aspiring Global Geopark (NPAGG) to expand the Canadian Geopark presence. In keeping with the objectives of United Nations Educational, Scientific and Cultural Organization (UNESCO) Global Geoparks, a key thrust of NPAGG is to develop opportunities for sustained regional economic development through sustainable tourism. The incorporation of smart tourism innovations in geopark destinations could offer both socio-economic and environmental sustainability advantages to the region.

1.2 Research Objectives

The main objective of this research is to assess the influence of Covid-19 on the tourism preferences of Millennial students, the role of virtual tourism innovations in meeting those preferences, and how the connection between technological innovations and post-Covid tourism patterns may translate into sustainable tourism models for NPAGG.

Specific objectives of the study are to:

1. Explore which forms of tourism Millennial students would like to experience in the aftermath of the Covid-19 outbreak.
2. Investigate the factors that will influence Millennial students' preferences for virtual or conventional tourism forms.

3. Explore Millennial student perceptions about the impacts of innovations like PIRTs on Niagara's geopark tourism.

1.3 Research Questions

To assess Covid-19's influence on the tourism preferences of Millennial students, this research will address the following questions:

1. What forms of tourism are Millennial students likely to undertake in the post-Covid era?
2. What factors will influence Millennial students' future tourism preferences?
3. To what extent do smart innovations like PIRTs satisfy Millennial students' preferences as alternative forms of travel?
4. How beneficial do Millennial students perceive PIRTs to be for Niagara's geopark tourism?

1.4 Significance of the Study

Findings from this project will likely yield an assessment of the needs of Niagara's Millennial community in relation to virtual tourism development and use. This project will contribute to understanding Covid-19's impacts on tourist behaviors and future tourism trends, especially in the context of geopark tourism in the Niagara region. The research further aims to deliver insights into the role of virtual tourism as a sustainable alternative while contributing to current research on Covid-19 and tourism innovation studies from the consumer's perspective.

Additionally, the project will offer insight into potentials for the Millennial generation of Niagara to benefit from stronger connections with the Niagara tourism industry and the NPAGG through smart tourism innovations. As the study results will be made available to the Brock University Community and the Niagara Geopark Board, the possibility exists that perspectives articulated in the thesis might inform local decision-

making which supports NPAGG at a key point in its development. Findings can also serve as a reference point for building a model of sustainable smart tourism that may be applicable in other geoparks in Canada and worldwide.

The results will prove helpful to scholars and other academics as a source for further research into virtual tourism innovation usage in the industry. Knowledge of strategic smart innovation alternatives that address tourists' needs and offer added benefits will be a valuable reference for destination planners, managers, or tour operators in their quest to develop digital solutions for resilience and competitiveness.

CHAPTER 2: LITERATURE REVIEW

2.1 Global Crises and Tourism

2.1.1 The Tourism Industry's Vulnerability to Crises

Against waves of disease outbreaks, terrorism attacks, economic downturns, conflicts, and several devastating phenomena that have marked the beginning of the 21st century, tourism continues to thrive as a resilient industry in many countries of the world (Novelli et al., 2018). However, despite its remarkable resiliency, tourism remains highly vulnerable to the same social, health, and environmental hazards - many of which have prompted local, regional and global crises at various levels of the industry. The growing awareness of these threats to tourism is reflected in several works of academic literature devoted to the topic (See, for example, Brown et al., 2017; Howard & Holladay, 2014; Huang et al., 2008; Sönmez, Apostolopoulos & Tarlow, 1999)

Becken (2017) describes vulnerability as the extent to which a community, system, or asset is predisposed to the damaging effects of a particular hazard. These can range from natural hazards like volcanoes and earthquakes to human-induced damages like wars. Lee and Harrald (1999) articulated that natural disasters, which are often difficult to predict and control, can profoundly impact destinations and disrupt the distribution chains of even the most prepared businesses. Natural disasters damage destination infrastructure, increase tourists' perceptions of risk, and lead to low demand for tourism services in affected areas (Floyd et al., 2004, Kennett-Hensel et al., 2012; Prideaux et al., 2020).

Writing about human-induced threats, Tarlow (2011) remarked that while natural disasters can obstruct tourism, threats of wars and terrorism tend to intimidate tourists even more. Over decades, this has been realized in many holiday cancellations and global tourism declines experienced during terrorism attacks (Bonham et al., 2006). The significant drops in tourism activity and visitor expenditures often result in substantial losses for the industry in afflicted regions (Bonham et al., 2006; Pizam, 2010).

Aside from natural disasters and social dangers, the frequency of infectious disease outbreaks that threaten human health and travel have increased significantly. In the first two decades of the 21st century, the world has battled outbreaks of Severe Acute

Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), Ebola virus, Cholera, Swine Flu (H1N1); West Nile virus, Zika outbreak, Monkeypox and the novel COVID-19 (Buckee, 2020; Park et al., 2020; WHO, 2019; Zeng et al., 2005). These have had manifold impacts on the tourism industry.

For example, following the SARS outbreak in the Guangdong Province of southern China in November 2002 and its eventual spread to parts of Southeast Asia, the World Health Organization (WHO) declared Guangzhou and Hong Kong as high-risk destinations. The outbreak sparked international anxiety, and diminished tourism activities in the region as travelers were regarded as both vectors and victims of the disease (WHO, 2020, Patel et al., 2020). A related scenario emerged with the recent 2019-nCoV outbreak, where a total travel ban imposed on over 20 million residents of Wuhan and neighboring cities was soon extended to about 90% of the world's population. Regarding Wuhan tourism, Zhan et al. (2020) disclosed great diversity in the willingness of Chinese tourists to visit or revisit Wuhan. This region used to be a significant domestic tourism destination in China before its image was tarnished as the epicenter of the Coronavirus outbreak.

Following assessments of the virus' alarming rate of spread, the World Health Organization (WHO) declared the outbreak a global pandemic on March 11, 2020 (WHO, 2020). Yang et al. (2020) described the outbreak as the most prominent global pandemic to hit nations since the 1918 influenza. Widespread apprehension surrounding the Covid-19 outbreak stemmed from global experiences of previous epidemics, such as the Spanish flu of 1918 and the Asian Flu (H2N2) of 1957, which caused about 50 million and 1.5 million human deaths, respectively (Petersen et al., 2020). Travel bans and restrictions on public gatherings which followed infection tolls impeded tourism in unprecedented ways. Within months, tourism framings shifted from "overtourism" (Dodds & Butler, 2019; Seraphin et al., 2018; Zacher, 2019) to "non-tourism" (Fabius et al., 2020). Since then, global evidence of Covid-19's impact on tourism has been sobering, mainly featuring radical drops in destination patronage, disrupted supply chain systems, a massive seventy-five million industry lay-offs, bankruptcies, and about USD 2.1 Trillion losses in revenue due to restricted travel (Brouder et al., 2020, 2020; UN report, 2020; WTTC, 2020).

The tourism industry's growing vulnerability to pandemics and global risks in the 21st century is mainly attributed to rapid urbanization, population growth, climate change,

industrialization in food production and supply systems, and developments in global transport networks (Hall, 2010; Cohen, 2012). Globalization has aided travel, movement of goods, financial flows, and increased risks of diseases and other vulnerabilities (Cohen, 2012; Khan et al., 2009; Jamal & Budke, 2020). In addition to globalized transportation systems, tourism's distinguishing characteristics, such as the industry's firm reliance on nature and extensive mutual dependence among actors, have served to heighten its vulnerability to health dangers such as pandemics and epidemics (Henderson, 2007).

In light of this, Hall (2010) predicted that pandemics and all possible impacts of crises on tourism would increase in scale and frequency as long as most places are globally interconnected. This also means that so long as disasters and associated risks continue, the tourism industry will remain exposed to negative occurrences and be continuously challenged with cycles of recovery and survival (Mair, Ritchie, & Walters, 2014). The impacts of the present Covid-19 outbreak exemplify the effects of such social and global complexities on tourism.

2.1.2 Evolution of Covid-19 and Extended Vulnerabilities on Tourism

The novel Coronavirus caused by SARS 2019-nCoV was first discovered in the Hubei Province of Wuhan in December 2019. As of February 2020, over thirty thousand cases had been detected and confirmed in mainland China (Chinazzi et al., 2020). By March 2020, over two million additional cases were detected and confirmed internationally. Despite efforts to contain the virus, the World Health Organization (WHO, 2020) recorded global cumulative projections of about 79 million infections and over 1.7 million deaths by the end of December 2020.

Containment restrictions adopted by governments and institutions to limit outbreaks were forecasted to last until the end of 2020 (Djalante et al., 2020). Officials believed that a universal vaccine might have been discovered to boost the fight against the virus' spread by that time. However, towards the end of the same year, the emergence of new mutated variants of the SARS-COV-2 virus reignited public fears and health risks.

Emerging variants such as the Beta, Delta, Omicron, and Alpha, which were characterized by increased transmissibility as well as remarkable changes to COVID-19 epidemiology, continued to challenge the effectiveness of social health measures while posing increased health risks to many populations (Burki, 2021; CDC, 2022).

With some countries experiencing more waves of the outbreak than others, governments around the world enforced different degrees of containment and restriction measures to curb alarming infection and death rates. Containment strategies mainly featured stay-at-home injunctions, school closures, restrictions on public gathering sizes, contact tracing, vaccination policies, mandatory use of facial coverings, closed public transport systems, and restrictive controls on international travel at both regional and national scales. These measures came with the provision of economic relief to affected societies (Burki, 2022; Hao et al., 2021). In Canada, territories and provinces took highly divergent approaches to stringency levels and times in implementing these curtailment measures (Cameron-Blake et al., 2021).

As the pandemic unfolded, tourism demand was adversely interrupted, with many people following isolation protocols and staying absent from public areas to keep safe from infections. International travel and tourism, which had been a phenomenal growth force for many world economies since the 1950s, was immediately interrupted (Khan et al., 2009; Jamal & Budke, 2020). Tourist trip cancellation decisions were exacerbated by unemployment, income loss, prevalent social distancing regulations, grounded airlines, closed airports, and excessive traveler anxieties (Butcher, 2020; Butler, 2020; Dube, 2021; Gursoy and Chi, 2020; ILO, 2020; Laesser & Bieger, 2020). Subsequent business resumption for most closed tourism and hospitality outlets was projected to be based on conditions of vaccination, reduced guest numbers, or mandatory quarantines in lieu of vaccinations (Laesser & Bieger, 2020).

Sports tourism which had been a growing destination marketing tool was drastically affected by the outbreak (Ratten, 2020). In the past decades, sporting events served as avenues for stimulating tourists' exposure to destinations (Gibson et al., 2012). Both activity participants, hobbyists, and supporters who traveled to engage in sports-related leisure or competitions formed essential tourist markets as they contributed to differentiating and shaping the marketing mix of destinations (Higham, 1999). The impacts

of curtailment measures during the pandemic changed this narrative. From running events to basketball, rugby, and other world championships, plans for major sporting events were disrupted, with no immediate reschedules. For the first time in contemporary sports history, the Olympic games were canceled in 2020 and rescheduled indefinitely until their final opening in 2021 (BBC World News, 2021). The Canadian Summer Games, originally planned to begin in August of 2021 in the Niagara region, was, in like manner, pushed back for a year due to public health concerns ([1]Canada Games Host Society, 2021).

Further cancellation of similar regional and international events led to an estimated USD 60 billion loss in sports tourism revenue globally (Gough, 2020; Ratten, 2020). As outbreaks continued through the end of 2020 and into the early months of 2021, extended restrictions led to further mobility and road transportation declines of about 75% (IEA, 2021; UNCTAD report, 2020). In periods when restrictions were eased, reports hinted that persistent limitations on maximum allowable capacities and physical distancing requirements for large gatherings in tourism activity centers continued to hinder the industry's recovery (Third interim report, 2020).

Cultural tourism was also significantly impacted as income generated from tourist spending on cultural goods and services of artists, printers, caterers, and designers was lost (Flew & Kirkwood, 2021). As many cultural artists are self-employed freelancers who rely primarily on the service sector and the gig economy, the shutdown meant a loss of income from their artistic work and other supplementary sources. In addition to significant economic losses, Covid-19 impacted the social value of cultural tourism destinations (Burke et al., 2020). The social value of investments in culture and heritage tourism, such as community affirmation and social cohesion, was hampered during periods of isolation and physical distancing. This situation exacerbated existing challenges of exclusion faced by marginalized communities of artists such as indigenous, queer, and people of color who represented their communities through arts and culture (Third interim report, 2020).

In response to uncertainties surrounding the pandemic's evolution, the CDC recommended that international travel be preceded by complete vaccination against Covid infections ([2]CDC, 2022; [3]CNN Travel, 2020). Following this recommendation, countries

[1] Canada Games Host Society, 2021- Canada Games Council - Stories
[2] CDC, 2022 - https://www.cdc.gov/coronavirus/2019-ncov/travelers/proof-of-vaccination.html
[3] CNN Travel, 2020 - A vaccine will be a game-changer for international travel. But it's not everything | CNN Travel

such as the United States, New Zealand, Canada, and some Caribbean countries, imposed vaccine mandates on employees and businesses, with some allowances for religious and medical exemptions. In the hospitality and tourism industry, customer access to service facilities such as restaurants, hotels, and cruise lines was heavily impacted by this directive (Morar et al., 2022). Intensification of vaccine mandates in the industry was backed by service providers' imperatives to make customers feel safe and secure within their establishments (Grimaldi, 2021). However, this led to reduced demand in hospitality and tourism facilities as people who did not meet complete vaccination requirements were denied access to services (Kelleher, 2021). The resulting economic impact on the industry was unprecedented.

The Financial Accountability Office of Ontario (FAO), for example, recorded that tourism and heritage activities contributed CAD 28.1 billion in direct benefits and an estimated CAD 15.6 billion in indirect economic benefits through provincial supply chains to the Ontario economy in 2019. The sector generated CAD 43.7 billion, representing 4.9% of Ontario's GDP. Of the 282,300 jobs generated by the industry, 125,300 were direct employment, while 157,000 were indirect opportunities. Tourism-related job openings comprised 4.3% of Ontario's total employment (Third interim report, 2020). But by May 2020, employment figures had plummeted by 20%. This decline presented devastating hardships for hourly-paid workers, who saw significant reductions in wage rates (Nicola et al., 2020).

Although some inferences about the impact of pandemics on tourism can be made from previous experiences of crises and disease outbreaks of the last decade, there has been no such precedent of a global tourism disruption as seen with the Covid-19 outbreak (Gössling et al., 2021). Vulnerabilities resulting from global response patterns and vaccination mandates are linked to how disruptions have impacted the industry and stressed an already vulnerable sector beyond its limits. Amidst economic downturns, rising unemployment, and instability in governmental interventions, the tourism sector's vulnerability to crises has been exacerbated (Nicola et al., 2020). Global shutdown risks have been unlike before, and future outlooks for the tourism industry's recovery remain uncertain. But while such growing concerns about the tourism industry's vulnerability to the pandemic may seem to be of secondary importance compared to the impending global

crisis that is predicted to follow the outbreak, it is utterly acceptable for academics, experts, and all concerned stakeholders to think about the future survival of the industry, possibly in ways that drive immediate resilience as well as future sustainability outcomes (Sigala, 2020; UNWTO, 2020).

2.1.3 Crises as a Change Trigger

Presently, there is not one universally accepted definition of "crisis." Though interpretations presented by different writers suggest that three elements must be present: a triggering event that causes or has the potential to cause significant change; a perceived inability to cope with this change; and a threat to the existence of the foundation of an organization" (Keown-McMullan, 1997, p. 4). Although "crisis" and "disaster" are often used interchangeably, Faulkner distinguishes the former as products of institutional stress "where the root cause of an event is self-inflicted to some extent through problems such as inept management practices or a failure to adapt to change" (Faulkner, 2001, p. 136). Conversely, disasters originate from unpredictable external catastrophes that impinge on industrial activity (Scott & Laws, 2006). From this distinction, Henderson (2007) makes the connection that catastrophes outside an organization can provoke a crisis within it.

In line with Watts et al.'s (2018) assertion that climate change and global health emergencies are the main drivers of change in the 21st century, McKinsey & Co. (2020) reported that the Covid crisis represented a significant health challenge and compelled consequential restructuring of the world's economic systems. The many concerns of academics, industry experts, and stakeholders pointing to a "new normal" or "reset" of tourism seem to reinforce this notion (Benjamin, Dillette & Alderman, 2020; Gössling et al., 2020; Higgins-Desbiolles, 2020; Sigala, 2020; Zenker & Kock, 2020).

In the face of unexpected changes brought about by the pandemic, Butler (2020) points out that the "sudden severe decline of tourism activities due to restrictions imposed on travel creates both opportunities and problems for all segments of the tourism industry and its customers" (p 633). Gössling et al. (2020) add that the widespread nature of outbreaks may potentially change consumer markets and demands previously satisfied by

existing tourism models during pre-pandemic times. Kock et al. (2020) observe that such paradigm shifts are possible because "what was previously taken for granted may not hold in the COVID-19 era" (p 2).

From mandatory quarantines for unvaccinated international travelers to vaccination clearance requirements for visa and passport applications, the Covid-19 pandemic can spark potential systemic changes in how travel may be conducted (Globetrender, 2020; Hall et al., 2020). In the future, regions where COVID-19 becomes normalized among the local population may be regarded as high-risk destinations, with subsequent consequences on tourist risk perceptions (Prideaux et al., 2020). Such designations can significantly affect tourism demand levels in those regions (Floyd et al., 2004, Kennett-Hensel et al., 2012). Risks faced by many tourism companies due to external shocks might also inspire new developments or the re-emergence of tourism models to enhance survival and continuity (Gössling et al., 2020). For example, the emergence of lean season travel (Chebli & Said, 2020, Pegg et al., 2012), domestic tourism (Dube, 2021), mountain tourism, and second-home tourism (Seraphin & Dosquet, 2020) can potentially serve as pull factors to inspire new tourism cycles and markets.

In other cases, the absence of tourism allowed a positive environmental reprieve from the constant output of pollution by tourists. From smog-free skies in China and cleaner air in Delhi to the crystal-clear waters of the otherwise murky canals of Venice, the pandemic's unintended environmental benefits were remarkable (Pelling et al., 2021). Cities such as Barcelona, Paris, and Milan adopted net-zero CO_2 pathways through strategies such as road reallocations to allow travel and offering night trains as alternatives to flying (Buckle et al., 2020). At the height of lockdowns in 2020, when transportation and over-tourism implications on the environment came to rest, carbon dioxide emissions declined by 17%. Compared to the 7% drop in 2019, the 2020 figures represented historically low carbon dioxide emission levels valued at 2.6 billion tons in 2020 (Aletta & Osborn, 2020).

According to a Global Energy review report by the International Energy Agency (Newell et al., 2021), the transportation sector, which relied mainly on fossil fuels and accounted for 37% of CO_2 emissions, was one of the sectors most affected by the pandemic. Not surprisingly, the most considerable decrease in emissions was found in the

transportation sector, with ground transportation and aviation recording 10% and 40% declines respectively, compared to 2019. Pelling et al. (2021) note that while the pandemic revealed a way out to the fight against climate change, it also highlighted the puzzling scope of the problem. This is because the amount of action needed to limit global warming, as proposed in the Paris Sustainability Agreement, would warrant reducing carbon emissions by 1 to 2 billion tons per year – about 80 % of pandemic levels. Pelling et al. (2021) however, argued that the scenario did not suggest that solutions to climate change lie in slowing down economies, disabling industries, and enforcing extreme measures that disrupt livelihoods.

Regrettably, the environmental reprieve experienced during the pandemic is not expected to last, as there are already indications that global emissions in coming years could rebound significantly and rise above pre-pandemic levels. The IEA (2021) predicted that as countries try to end restrictions and return to a new post-Covid normal, boosting economic activities could lead to increased global energy demand. When this happens, the record drops in CO_2 emissions will only represent blips in trend lines, indicating unsustainable surges in the future (Andreoni, 2021, Newell et al., 2021).

A crisis can trigger change, but according to Hall et al. (2020), no crisis has significantly transformed tourism as Covid-19. Beyond the general belief that tourism will rebound from present decline levels, many studies predict that the current changes in the industry are precursors for broader level transformations and paradigm shifts in future tourism paths (Cheer, 2020; Kock et al., 2020; Sigala, 2020). In line with thoughts about paradigm shifts, the UNWTO notes that the "crisis may offer an opportunity to reshape the sector and ensure it grows better along prioritized inclusivity, sustainability and responsibility goals" (UNWTO, 2020a; p.33). They further suggest that rebuilding the industry would require giving special attention to resilience and sustainability objectives at all levels.

2.1.4 Rethinking Industrial Transformation beyond the Crisis

Crises impact tourism, and some societies may have developed resistance and resilience strategies against their occurrence (Hajibaba et al., 2015). Nonetheless, the impacts of Covid-19 stand out because of the pandemic's alarming infection rates, occasioning global collapse of tourism, and its potential for shaping many aspects of the industry's demand, consumption, supply, and sustainability (Gössling, Scott & Hall, 2021). To some extent, the crisis has been regarded as a transitioning moment towards better lifestyles or perspectives for societies and industries across the globe (Higgins-Desboilles, 2021). Transitions or transformations are described by Rotmans and Loorbach (2009) as disruptive structural changes to societal systems which are driven by interconnected developments in the economy, technology, institutions, culture, or ecology.

While acknowledging the heavily criticized impacts of overtourism on the environment in pre-Covid times, as well as the devastation brought on the industry by the pandemic, several reports and post-pandemic industry outlooks articulate the need for industrial resetting and transformational thinking (see Brouder, 2022; Hall et al., 2022; Higgins-Desbiolles, 2020; Lew, 2020; Sigala, 2020). For example, Niewiadomski (2020) reflects on the temporary de-globalization brought on by the pandemic and opines that the situation offers the tourism industry an opportunity to shed its damaging effects of environmental degradation, economic exploitation, and global climate change while rebooting in line with sustainability requirements. Renaud (2020) suggested alternative tourism paths which are oriented towards degrowth and deglobalization principles in global mobility outlooks. Prideaux et al. (2020) maintain that lessons emerging from the pandemic can be applied to strategies for dealing with climate change, whereas according to Gössling et al. (2020) encourage societies to see the outbreak as an opportunity to reconsider tourism's growth trajectory and question the logic of more arrivals implying greater benefits. Such thinking may begin with an actionable commitment to individual responsibility and equity, according to Benjamin, Dillette and Alderman (2020).

In a similar vein, Gretzel et al. (2020) challenged researchers to advance innovation, especially e-tourism, in the transformative thinking process instead of resorting to "business as usual" (Saarinen & Wall-Reinius, 2021). Their challenge was underpinned by

the assumption that whichever course of thinking or action, although different in outcomes, could yield transformative consequences for the industry's future (Gössling & Scott, 2020; Sigala, 2020). Higgins-Desbiolles (2020) regards the transformational thinking school of thought as a turning point whose impact may be irreversible as it may fundamentally change the nature of tourism and mobility in the future. Brouder et al. (2020) remark that such transformation would be realizable if sufficient innovation occurs in both the demand and supply aspects of tourism.

Together, these studies articulate a reorientation of the tourism sector towards sound financial economies as well as the socio-ecological well-being of societies (Higgins Desbiolles, 2020; Ioannides and Gyamóthi, 2020). To this, Higgins-Desbiolles (2020) contends that human actions, especially, need to change to avoid the worst effects of the pandemic by noting that the crisis offers society an unexpected opportunity to rethink tourism production, growth, and consumption patterns in ways that enhance global good.

However, contrary to growing calls for ethical reforms on responsible and sustainable tourism patterns that seek to regulate and mitigate the negative impacts of the industry on societies, other studies champion a boosterism approach that advocates that recovery must entail a significant rebound in people's travel activities and a re-growth of revenue streams (Fletcher et al., 2021). This school of thought which emphasizes the tourism sector's historical capacity to cope with shocks advocates a return to growth paths in pre-crises times (Saarinen, 2020). Arguably, this path benefits individuals, businesses, and organizations in their consumption pursuits to the disadvantage of the rights of local communities, ecological systems, and marginalized groups or people who cannot travel due to certain inequalities they face (Higgins-Desboilles, 2020).

In light of the need for transformational change, these studies suggest that progressing through the current crisis and planning toward more resilient tourism futures would require paying considerable attention to both vulnerabilities and stakeholder actions that impact the industry. Tourism stakeholders are challenged to redefine present and future tourism concepts; to pay more attention to the costs, impacts, and risks of environmental dangers that disrupt the industry at both local and global scales; and to reconsider new strategic actions and innovations to aid the industry's sustainability against intensifying threats in a world of increased travel (Fennell, 2020; Jamal & Budke, 2020; Sigala, 2020).

This gap forms the point of departure for the current research, which seeks to assess the influence of the pandemic on people's consumption behaviors. Tying in thoughts on responsible consumption for both the immediate resilience and long-term sustainability of tourism in post-Covid times (Jamal & Budke, 2020; Niewiadomski, 2020), this study assesses the possibility of employing virtual tourism innovations (Fennell, 2020; Gretzel et al., 2020; Sigala, 2020) as alternative pathways for consuming tourism in post covid times (Brouder et al., 2020; Higgins-Desbiolles; 2020). The intent is to discover whether such a transition to VT is possible in the short term and to analyze if the transitions might be perceived as a way to redirect tourism from the unsustainable trajectories of pre-pandemic times (Ioannides and Gyamóthi, 2020; Prideaux et al., 2020b; Renaud, 2020).

2.2 Covid-19 and Tourism Consumption

2.2.1 Tourism Demand and Consumerism

Global economic development and growing societal affluence have been accompanied by increased consumption of resources and experiential services (Liu et al., 2019). In the tourism sector, studies on demand and consumption have been vast and numerous, mainly covering aspects of tourism demand characteristics, travel patterns and motivations, and tourist behaviors through the tour process (Song et al., 2019). Further studies on the determinants of tourism demand have primarily characterized factors under critical areas of economic, social, and ecological determinants. Martins et al. (2017) identified macroeconomic variables that influence tourism demand and eventual consumption to include tourist income levels, prices of tourism products and services in destinations, and currency exchange rates in international tourism contexts. These factors directly influence tourist expenditures and their intentions to undertake specific forms of tourism (Buhalis et al., 2022).

Social determinants of tourism demand and consumption comprise psychological factors such as tourist attitudes, motivations, and opinions about travel (Lanzini & Khan, 2017), demographic factors like age, gender, educational level, employment status, occupation, or household composition (Wambani et al., 2020); trip-related factors such as

destination characteristics, perceived travel experiences, trip duration, activities, mode of tourism and information (Liu et al., 2022). Other external social factors include longer life expectancy, quality of health, increased disposable leisure time, technology, changes in social conditions, ethics, personality, and stimulating curiosity (Cooper, Scott & Kester, 2006; Mueller & Salonia, 2022). Ecological determinants of demand consider environmental aspects of sustainable tourism consumption forms, the impact of tourist activities on host environments, and climate change issues (Mathieson & Wall, 1982; Shaw, Agarwal & Bull, 2022).

Sustainable consumption, which is regarded as an integral component of resource preservation and societal development, stands out in most discussions on ecological considerations of demand (Cohen, 2020). The idea is overlapped with concepts such as green, ethical or responsible consumption to describe consumption behaviors and activities oriented toward sustainable development (Thieme et al., 2015). These conceptualizations surpass definitional conflicts to address key issues such as enhancement of quality of life, minimizing waste and pollution, improving the efficient use of resources, and enhancing intergenerational equity while continually reducing damages to human and environmental health (Wang et al., 2019).

In tourism, the notion of sustainable consumption has received much attention due to the depletive impact, as well as the reliance of tourism on the natural environment (Fennell & Cooper, 2020). Yet, despite efforts to promote awareness of sustainable consumption, research indicates that consumers are not yet deeply engaged in the application of the idea to tourism transformation, as a majority of tourism consumers are just beginning to consider sustainability as an integral part of their purchasing and consumption decisions (Eberhart & Naderer, 2017). Sustainable consumption also remains a challenge due to people's hedonic nature (Caruana et al., 2019). This character lends the tendency of pursuing consumer sovereignty in ways that contradict sustainability consumption practices (Eberhart & Naderer, 2017).

Regardless of this limitation, the continuity of tourism, coupled with amplified demand from new and existing tourist markets, continue to trigger important questions about tourism's impact on the social and ecological systems on which it relies. In the post-Covid scenario, these considerations are even more pertinent as consumers develop a

growing consciousness of their personal needs and social responsibilities toward others (Gretzel, Fesenmaier & O'Leary, 2006; Dube, 2021).

2.2.2 Impacts of Covid on Tourism consumption

For an industry that generated about 1.5 billion international global tourist arrivals and USD 1.7 trillion in export revenues as of 2019 ([4]UNWTO, 2020), the complete shutdown of over 27% of worldwide destinations that accompanied the pandemic resulted in an unprecedented fall in international tourism. The UNWTO reported a 1 billion loss of international tourist arrivals, representing 74% of pre-pandemic arrival levels. This translated into a USD 1.3 billion loss in international tourism receipts and an estimated USD 2 trillion loss in global GDP (UNWTO, 2020).

Travel restrictions, slow viral containment, concerns about declining health, and prolonged financial stresses which accompanied the outbreak were predicted to have a latent effect on the industry's recovery (Gasdia & Jackson, 2020). These factors are anticipated to influence changes in tourist travel behaviors and lead to new tourist markets or consumption trends that focus on authenticity, sustainability, and localism (UNWTO, 2020; Higgins-Desboilles, 2020). To better understand the pandemic's impacts on tourism consumption in the post-Covid era, several studies have attempted to analyze tourist attitudes towards leisure, travel risk perceptions, the new tourism psyche, current and future travel sentiments, the contactless tourism economy, impacts of Covid on travel modes and implications on protected areas, as well as outdoor recreation (Bae & Chang, 2020; Buckley, 2020; Chen et al., 2020; Perić et al., 2021; Zenker, Braun & Gyimóthy, 2021; Zenker & Kock, 2020).

Hinting at possible pandemic-induced behavioral transformations among tourists, these studies attempt to address how people's concerns with health, finances and

[4] UNWTO, 2020 - https://www.unwto.org/news/2020-worst-year-in-tourism-history-with-1-billion-fewer-international-arrivals

responsibility towards the environment may evolve along with the crisis and shape future tourism decisions and patterns for the foreseeable future (Gasdia & Jackson, 2020). Butcher (2020: 27), for example, claims that social distancing protocols would "diminish holiday pleasures to the extent that many may choose to stay home." Pointing to a possible surge in nature tourism observed in Europe, for example, Spalding et al. (2020: 2) also aver that post-Covid market forces "are likely to heighten awareness of the value and dependency of tourism on nature, and indeed to increase these values and this dependency."

In pre-and post-pandemic tourism consumption studies, economic, ecological, and social determinants are recurring influencers of tourist consumption behaviors. How these factors play out to influence specific post-pandemic tourism consumption patterns remain an interest for future research to explore. It is against the background of Covid-19's devastating impacts on tourism and initiatives for re-igniting responsible demand and consumption that this research was undertaken. What then do consumers' evolving health, economic, and social concerns, along with their growing online shopping behaviors tell about their travel intentions in post-Covid times?

2.2.3 Ethics of Sustainable Consumption

The concept of sustainability has undergone significant evolution in the last four decades. The idea has been engaged as a framework to guide decisions concerning energy challenges, waste management, health concerns, community planning, and economic growth issues confronting humanity and the planet over the years (Becker, 2012). Presently, achieving a completely sustainable future in the face of rapidly increasing complexities such as climate change, increasing carbon footprint, loss of biodiversity, energy challenges, population growth, rising per-capita consumption, and poverty seems daunting, if not impossible (Gasper, Shah & Tankah, 2019; Kibert et al., 2012). What remains is a crucial need for consumers to cultivate ethical ways of thinking through their responsibilities toward unseen others and to develop a renewed sense of social interconnectedness, one which extends to future generations who are at the mercy of

contemporary production and consumption patterns (Amantova-Salmane, 2015; Kibert et al., 2012).

Becker (2012) recognized the inherent ethical dimension of sustainability through human actions by noting that most of the challenges and problems associated with sustainable development can be traced to ethical shortcomings in sustainability practice. Becker believed that the present sustainability issues being faced are not merely broad structural shortcomings. Instead, they are critical challenges regarding individual responsibility and autonomy in basic conservation and development practice; and these translate into tensions between more general structural systems. Becker thus conceptualizes sustainability as "the ability to establish continuance as a means of orienting human actions toward the threefold relatedness of human existence to contemporaries, future generations, and nature" (Becker, 2012; p. 14). His ideas reinforce the need for a more robust ethical orientation in sustainability practice, where individuals exercise their agency based on responsibility toward the greater good. In agreement with this thought, Fennell (2019) posited that the successful pursuit of ecological health, social equity, and economic welfare through sustainable actions grounded on ethical commitments would ensure the well-being of present generations, the preservation of environmental resources for future populations and enhanced opportunities necessary for a good life.

The notion of "ethics" is described in banal terms as a set of moral principles that govern a person's behavior (Thomson, 2007**).** Derived from the Greek word "ethos," which means a way of living, the philosophical concept of ethics deals with a system or theory that reflects interactions between human beings, society, and nature on the basis of responsibility, moral values, or care (Beauchamp, 2001). The concept traditionally includes individual intellectual deliberations and concern for what is good, bad, right, or wrong, as well as systematic moral codes of conduct practiced by groups or societies (Bauman, 1994; Shearman, 1990). An ethical disposition influences how people make decisions and live their lives by helping them question, define and defend what actions ought to be accepted or discouraged (Kibert et al., 2012).

Although ethics is not necessarily a law, religion, or commonly accepted norm (Borghini, 2017), most prominent ethical perspectives emanate from religious, philosophical, and cultural knowledge that deals with moral principles (Jones et al., 2007,

Gallagher, 2011). Growing interest in the concept of ethics emanates from the need to reconcile people's obligations, desires, and actions with the greater good of both seen and unseen others (Kibert et al., 2012; McEwan & Goodman, 2010).

Sustainability thinking grounded in ethics follows the assumption that negotiating the nexus between individual actions and the ultimate sustainability of the planet requires continuous reflections on consumption behaviors based on morality (Fennell, 2019). Barnett et al. (2005) draw inspiration from Foucault's notion of ethics as self-care to suggest that ethical dispositions are almost always inscribed in everyday consumption performances. These dispositions are in-turn "worked up, governed, and regulated by an array of actors who ensure possible forms of individualized conduct" (Barnett et al., 2005b: 29). In such a society held together by impersonal institutions and forms of discursive power, living responsibility would require individuals to imbibe ethical significance in the practical exigencies of daily life (Popke, 2006).

Emphasis is placed on human behavior because the human subject is seen as the most important agent of change, with abilities to modify the environment to great extents through consumption patterns (Gasper, Shah & Tankha, 2019). Consumption as a social practice should thus be underpinned by understanding what is acceptable and our obligation to others (Kibert et al., 2012). This idea obviously has consequences on consumption in the tourism industry, given the reciprocity of relationships and impacts between the industry, interrelated natural and social environments, and sustainability (UNWTO, 2015). Tourism as a sociocultural phenomenon is rapidly evolving. And its transformation could be elevated with renewed interest in ethical conduct on the part of tourists (Nicolaides, 2020).

2.2.4 Alternative Hedonism

The concepts of sustainable, ethical consumption emerged in response to the detrimental consequences of hedonic consumption behaviors that prevail in capitalist societies (Caruana, Glozer & Eckhardt, 2020). In response to the challenges of hedonic consumption behaviors, advocates of markets for virtue such as Barnett, Cafaro, and Newholm (2005)

proposed a morally restrained, self-disciplining disposition to consumption, which sought to control the insatiable impulses of humans. They believed that increasing consumer awareness of the harmful effects of overconsumption would herald a radical reduction in hedonic consumption forms and lead to demands for cleaner, fairer, and more sustainable products (Borgmann 2000). Unfortunately, this disposition fails to materialize. Doherty et al. (2013) recognized that persistently setting morality in opposition to pleasure, by projecting moral markets as only successful if they effectively suppress hedonic pleasures (Schor 1998; Wilk 2002), largely leaves consumers apathetic and disenchanted about the role of morality and its effect on their socio-ecological consumption patterns. As a result, consumers become unwilling to trade off the benefits they seek based on ethical principles (Carrington et al., 2010). The failure is also exacerbated by other socio-economic forces such as convenience, price, luxury, and prestige, which impact consumer behaviors and their abilities to make ethical choices in the face of alternatives (Caruana, Glozer & Eckhardt, 2020).

To deal with this weakness, some studies suggest the activation of hedonic tendencies to propel the mainstreaming of moral markets (Borgmann, 2000; Caruana, Glozer & Eckhardt, 2020; Geisler & Veresiu, 2014; Hilton, 2004). This is because consumers lived experiences carry within them both hedonic and moral tendencies that shape their experiences in powerful ways (Caruana, Glozer & Eckhardt, 2020). Mobilizing this inter-relationship in ways that allow morality and pleasure to be seen as productive, iterative aspects of consumer behaviour can thus reignite people's moral tendencies towards consumption (Geisler & Veresiu 2014).

Although less explored in the context of adaptation research, Soper's theory of Alternative hedonism (Soper, 2007) emerges as a helpful lens through which people's hedonic and altruistic tendencies to consumption can be conceptually merged. Soper's theory is based on the belief that consumers need to shift from affluent modes of consumption which has detrimental impacts on resources, towards a new way of consuming differently. One which is motivated by self-interest but grounded on selfless concern for the social and ecological consequences of consumer actions. Rather than sidelining pleasure, such an approach could enable people to use aspects of their hedonic orientation towards egalitarian ends. Caruana et al. (2020) described this alternative as a

self-disciplining way for consumers to reconcile morality and pleasure in the pursuit of their consumption experiences.

Situating alternative hedonism within current debates on moral consumption, Caruana et al. (2020) identified two key areas in which Soper's idea provides insight. The first deals with viewing pleasure as a vehicle for moral responsibility, in that consumers choose to sustain the pleasure they obtain from consumption experiences by reconciling concerns of pleasure and morality instead of restricting hedonic tendencies. The second emphasizes perceiving morality and pleasure as "two sides of the same coin" (p. 147), where contrasting viewpoints about the interests of both concepts are eliminated, as proposed by other studies (Carrington et al. 2016; Devinney et al. 2010; Husemann and Eckhardt, 2018).

This research applies the theory of alternative hedonism to outline the role of ethics as a useful condition to guide human thoughts and actions, especially in their consumption of resources towards sustainable ends. The study explores alternative hedonistic tendencies by analyzing the ethical basis of Millennial students' tourism preferences from the virtual tourism viewpoint. In this vein, Millennial students' decisions to shift to alternative (virtual) ways of consuming tourism as a way of adapting to mobility challenges, while contributing to the industry's resilience and long-term sustainability would show their willingness to contribute to a common good through their current purchasing decisions.

2.2.5 Post-Covid Millennial Tourist Markets

Tourism marketing and consumption studies have attempted to understand market typologies by studying people's attitudes and motivations for undertaking tourism activities, their subjective experiences, their perceptions about tourism innovations, and through generational lenses (Monaco, 2018). Among these factors, Corbisiero & Ruspini (2018) identified generational shifts as a significant force that shapes tourism. This is because generational cohorts form shared values, beliefs, and preferences that become longstanding tourism consumption behaviors. Recognizing the homogenous characteristics of generations thus becomes a valuable method for segmenting tourist markets. Based on

this knowledge, many contemporary studies have attempted to understand the needs of various generational segments in order to predict their unique tourism requirements better (see, for example, Jamal & Newbold, 2020; Kim & Park, 2020).

According to Strauss and Howe (1991), a generational cohort consists of individuals in a shared age bracket who also share a defined history of external events that influence their behaviors, personalities, and consumption patterns. Although most common sources of generational research agree on names, there is less clarity on approved age ranges for defined generational cohorts (Zwanka & Buff 2021). The contention can be linked to debates that question whether the year of birth alone as an effective method for is forming cohorts rather than considering milestones that create societal shifts or bring on new sets of values (Debevec et al. 2013, p. 21).

To address this dichotomy, Parry and Urwin (2017) suggest that researchers investigate cohort-specific differences and prevalent attitudes between generations to determine "structural breaks" which hint at where a cohort should begin or end. Such a recommendation is in line with the works of pioneers like Karl Manheim, who advocates discerning the connection between biological relationships, such as being born within a similar period and socio-political events experienced by a cohort (Schuman & Scott, 1989). Strauss and Howe (1991) also admonish that while individuals within any generation vary from one another, the environment within which they are raised can yield characteristics observable as broad tendencies. These perspectives have led to several individual and organizational studies which reflect on general life events and experiences as well as the impacts of specific events encountered by generational cohorts (See, for example, Cooper, 2013; Anderson et al., 2016; Koschate-Fischer et al., 2018; Larson & Shin, 2018). There also exist studies on social issues such as mental health (Furnham & Shiekh, 1993; Kwong et al., 2021), employment and organizational behavior (Baum, 2010; Baum, 2019), and consumer behavior (Cohen et al., 2014; Eger et al., 2021; Wiese & Kruger, 2016). Following this direction and contributing to cohort-specific groupings, this study attempts to assess the impacts of Covid-19 on the potential tourism behaviors of Millennial students in the aftermath of the pandemic.

For the purpose of defining sampled respondents for this study, the Millennial categorization by Strauss and Howe (1991) is applied. In their book *Generations: The*

History of America's Future, 1584 to 2069, the authors discussed the Millennial cohort to consisting of individuals born between 1982 and 2004. While most studies have attempted to address Millennial behaviors and their responses to prevailing societal issues, there is a growing body of research into the impacts of technologies on Millennial social behaviors in various aspects of livelihood (Bolten et al., 2013; Hopkins et al., 2018). This is primarily due to the Millennial generation's familiarity with digital technologies.

Millennials' natural inclination to technology is a characteristic of their growing up in a period of booming internet and smartphone revolutions and rapid environmental change (Howe & Strauss, 1991;[5] KPMG, 2017). They are regarded as the first generation to have lived entirely in digital environments; hence ICTs profoundly influence how they live and work (Skinner et al., 2018). Technology is at the core of the Millennials' everyday activities, such as communication, entertainment, education, social engagement, and travel planning (Ketter, 2021).

Benckendorf et al. (2009) throw light on Millennials as the most important generational group for current tourism and global economies. This is firstly due to the importance Millennials attach to travel. Millennials rank tourism as a top priority lifestyle activity and travel more than other generations, including baby boomers (Cavagnaro et al., 2018). Their inclination to technology will potentially influence innovation development in the tourism industry (Sethi et al., 2018). Furthermore, Damanik et al. (2020) forecast that Millennials have yet to enter their peak earning and spending years. In this period, they will advance young traveler markets, introduce new attitudes and travel trends, and offer possibilities of continuous travel in the future for the tourism industry. Their tourism motivations and preferences can open opportunities for new tourism products, services, and shifts in tourism markets (Ketter, 2019; OECD, 2018).

Travel motivations are considered a critical concept in tourism and have been studied on both empirical and conceptual grounds to define how and why people make tourism decisions (Crompton, 1979). Millennial travel and tourism motivations have been known to be influenced by cost, peer recommendations, accessibility, time, authenticity of experiences, and sustainability. These factors are known to determine the Millennial

[5] KPMG, 2017 - https://assets.kpmg/content/dam/kpmg/uk/pdf/2017/04/Meet-the-Millennials-Secured.pdfhttps://assets.kpmg/content/dam/kpmg/uk/pdf/2017/04/Meet-the-Millennials-Secured.pdf

tourist's loyalty, preference for, and satisfaction with a particular tourism form, as well as revisit intentions (Kim et al., 2021). Beyond the positive characteristics, however, lies a weakness of anxiety which is attributed to impacts of the many environmental crises and societal changes Millennials have evolved through (Schaeffer & Rainie, 2020). This character stirs significant concerns about employment, politics, marriage, education, and their general future outlook. Facing another crisis like Covid-19 will undoubtedly have a profound impact on Millennials' outlook on tourism (Schaeffer & Rainie, 2020). Based on this recognition, the current research explores which factors or motivations will influence Millennial student's preferences for alternative tourism forms such as PIRTs in the post-Covid era.

2.3 Technological Innovations for Tourism Transformation

2.3.1 ICTs and Tourism

Technologies are transforming many types of professional ecosystems around the world. Innovations in information technologies are allowing organizations to continually embrace internet-based business models where internet users are also consumers (Gretzel, Fesenmaier & O'Leary, 2017). These new digital landscapes are bidirectional information ecosystems that provide improved interconnectivity and communication routes between tourists and tourism companies (Gretzel et al., 2015). They are bi-directional in the sense that users are enabled to publicly share their opinions about services or products with other users on the one hand, while companies, on the other, utilize the platform to assist clients with product information and service issues that may arise (Back et al., 2021). Aided by emerging innovations like artificial intelligence, machine learning, and big-data mining, modern digital landscapes allow businesses to use information generated from customer data on the internet to identify patterns in user behaviors and create competitive value (Gretzel et al., 2020).

Sigala and Marinidis (2012) note how modern digital landscapes have given rise to new technology-based business models in business sectors such as tourism, finance,

consulting, design, and marketing. The application of ICTS or digital technologies for automatic data processing in a tourism environment can be referred to as digital tourism (Boes et al., 2015; Gretzel et al., 2015). Many researchers have studied digital tourism in terms of their applications in enhancing tourism experiences and services (Buhalis et al., 2019). Continuous global advancements in technological transformations in the past decade have also given rise to further research on the evolution of tourism businesses in such digital landscapes (Minghetti & Buhalis, 2010).

For example, in their study of technology-based tourism business, Ramon-Saura et al. (2020) predicted some technologies on which future digital tourism businesses and services might be based. They listed virtual reality technologies which allowed remote testing and access to destinations; the internet of things to give meaning to large amounts of tourist data; configured AI chatbots to offer instant feedback and information; augmented reality to enable tourists enjoy real-time displays of events; block-chain for increased security of online payments; location-based technologies to help travelers find destinations and promotional offers; language and voice technology, and mobile applications for online bookings, etc. The authors suggested that insights into the use and significance of such innovations to tourism businesses would create a roadmap for enhancing user experiences in future digital tourism ecosystems (Ramon-Saura et al., 2020).

To its implications on tourism consumption, Gretzel et al. (2015) highlight how innovations like the internet changes the concept of time and influences new consumption and communication patterns that necessitate supply adjustments and new market strategies. Digital technologies like websites and smartphones for cloud computing, virtual reality, and big data processing enhance tourists' ability to actively co-create experiences by offering a way for autonomous gathering, sharing, and processing of information related to their tailored travel experiences (Gretzel et al., 2020; Fuchs & Höpken, 2020). Rubio et al. (2021) argue the potential for these technologies to influence an objective rather than subjective comprehension of tourism places and experiences. This will be possible due to the generation of accurate data and information based on objective indicators of time, distance, numeric ratings of destinations, modes of transportation, etc.

2.3.2 Tourism Consumption and Virtual Tour Innovations

ICTs and digital transformations have reached the tourism industry in earnest, beckoning attention to tourism as an experience that can also be consumed online (Martinez, 2020). Among growing reflections on the transformative impacts of Covid-19 on tourism, special attention is given to the possibility of pioneering new innovations, technologies, and products to facilitate resilient tourism consumption (Fennell, 2020; Gössling, 2020). Whereas innovation significantly involves "challenging existing assumptions and ways of thinking" (Moscardo, 2008, p.5) to add value or transform ideas and processes into marketable products and services (Peters & Pikkemaat, 2006), technology is considered as both a form of innovation, a catalyst for change, and a tool to build tourism's resilience in crisis (Neuhofer et al., 2014). In addressing the potential for varied travel forms in the age of crises, Fennell (2020) writes that society is gradually transitioning into a new era of tourism driven by the many disruptive influences of technologies, health concerns, economic uncertainties, and environmental challenges. These changes demand innovative tourism models which "reflect visions of transformation and adaptation in rapidly changing times" (p6).

Of the many examples of emerging digital innovations and their applications in tourism, studies have attended explicitly to the potential of smart or virtual tourism technologies as appropriate inventions to address dialectical relationships between tourism production and consumption systems (Buhalis & Amaranggana, 2015). Although the terms "smart tourism" and "virtual tourism" are used interchangeably, they both represent digital innovations that use mobile or web-based applications to portray urban spaces or attractions in digital forms and deliver virtual touring or tour guiding experiences (Buhalis et al., 2019). Basic virtual tour simulations typically consist of videos or still photographs of real-world locations, background sounds, narrations, and blurbs or information about destinations (D'Arcy & Omar, 2015).

In addition to assurances of safety, security, accessibility to peripheral destinations, and value for money (Wang et al., 2012), virtual tourism innovations have paved the way for surrogate tourism experiences, which are regarded as acceptable alternatives in nature-

based tourism businesses and destinations (Gretzel et al., 2020). Hence, their potential to serve as resilient alternatives to conventional travel in the present and future tourism contexts cannot be overlooked. Gretzel et al. (2020) affirm that virtual tourism technologies are a potentially synergistic solution for developing balanced and resilient tourism regions in the post-COVID-19 era. However, their perceived advantages do not mean virtual tourism innovations are without weaknesses. In fact, researchers have highlighted pressing concerns in the areas of access to appropriate infrastructural resources, operational skills needed for their use, and implications on ancillary tourism services or businesses in destinations (Boes et al., 2015; Gretzel et al., 2015).

Yet, regardless of their inherent weaknesses, there exist an inexhaustive list of virtual tourism (VT) platforms that use mainly video or still photography forms to promote products and services. Examples include Klapty[6], a website that allows users to create and share their virtual tours as pictures or videos. Tours by Locals [7] is another VT service website that hosts over 94 tour guides who connect remote tourists to destinations in over 40 countries globally, as shown in Figure 2.1. Amazon Explore[8] hosts VTs for cooking, walking tours, and live travel. Tour experiences are live streamed by a host on location through video devices and two-way audio features that allow for dialogue and questioning. Flyover Zone[9] offers historical tours on culture, antiques, archaeology, or other significant heritage through a 3D model. The platform enables tourists to see original images of off-limit areas or travel back in time to see how destinations looked years back. Indagare[10] offers VTs on wines, and Niagara Historical Museum[11] offers VT services on galleries, indigenous history, and Niagara Falls tourism.

Other platforms include Urban adventure[12], Google Arts and Culture[13], Earthcam, and Walking Tours[14]. Outside of tourism, VT innovations have been used by the real estate

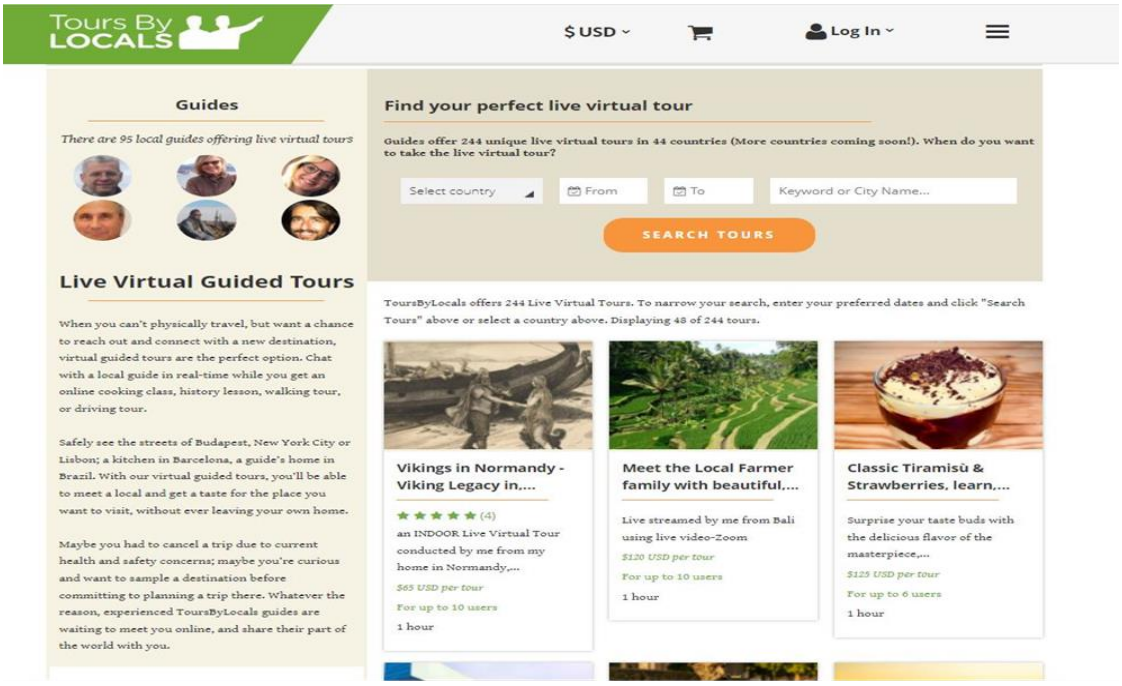
[6] Klapty VT site - https://www.klapty.com/
[7] Tour by Locals VT Site - https://www.toursbylocals.com/Live-Virtual-Tours/
[8] Amazon Explore VT site - https://www.amazon.com/b?node=19419898011&ref=ps_ae_2/
[9] Flyover Zone VT site - https://www.flyoverzone.com/baalbek-reborn-temples/?utm_source=flyoverzone.org&utm_medium=Press&utm_campaign=Baalbek%20Reborn%20Temples%20Launch/
[10] Indagare Global Classroom - https://travel.indagare.com/globalclassroom/
[11] Niagara Falls Museum VT tours - https://niagarafallsmuseums.ca/tours/2021-digital-tours/
[12] Urban Adventures VT site - https://www.urbanadventures.com/online-experiences/
[13] Google Arts and Culture - Google Arts & Culture
[14] Walking Tours - https://www.youtube.com/channel/UCPur06mx78RtwgHJzxpu2ew/videos/

and education industries. For example, Momentum[15] allows property owners and brokers to show off and walk potential buyers through properties in real-time. Several universities offer VTs of their campuses and facilities as part of image projection efforts.

Figure 2.1

A snippet of product offerings from the Tour by Locals website

Sourced from WWW.Tourbylocals.com



2.3.3 The PIRT Model

Proposed as a surrogate to traditional in-person ecotour experiences by Fennell (2020) in his article *Technology and the Sustainable Tourist in the New Age of Disruption*, the Personalized Interactive Real-time Tour (PIRT) model is described as a form of virtual or smart tourism that allows tourists to employ remote tour guides to facilitate interactive real-time tours from the comfort of their homes. The model allows tourists to remain in their

[15] Momentum Property tours - https://www.momentumvirtualtours.com/virtual-tours

home locations while employing and enjoying the services of a tour guide in a remote destination, within or away from the tourist's home region. The use of cameras, video technology, and the component of real-time interaction allows tourists to ask questions and receive immediate information about the destination (Dorcic et al., 2019).

PIRT implementation would involve the use of 5G streaming technologies, 360-degree view cameras, webcams, drones, smartphones or personal computers, a live website or host domain, and access to internet services (Fennell, 2020). The 360-degree view component of the tour would allow tour guides to navigate videos in angles or directions in which the tourist wishes to view. The model further proposes that visual images are complemented by real-time audio to enable its users to receive feedback and other rich sensory information. According to Disztinger et al. (2017), such features would allow tourists to understand better a destination's spatial, factual, and experiential aspects.

Through a comparative analysis to determine the benefits and trade-offs of the PIRT model as a sustainable alternative to traditional ecotours, Fennell (2020) observed that a significant advantage of the model would be its use as a "resiliency buffer" for ecotours in areas or circumstances where tourism is hindered due to events such as Covid-19 or wars. It also becomes a realistic alternative for ethical travelers who are concerned about the impacts of their travel activities on the planet's ecological footprint (Gretzel et al., 2020). Additionally, PIRTs can become a popular alternative for people who wish to avoid extra costs associated with conventional travel (Fennell, 2020). For people with special accessibility requirements, such as seniors, minors, invalids, or people with mobility difficulties who may be inconvenienced by long-haul travel (Buhalis & Amaranggana, 2014), the model can serve as an appropriately accessible option to tourism.

The personalized nature of the tours would require flexibility of time use and the employment of many tour guides to facilitate several tour activities within any specified time. This would create jobs for local populations in destination regions (Dabeedooal et al., 2019). The likelihood of tourists seeing destinations remotely before their visit can also become a pull factor that influences tourists' decisions to see attractions in-person during future trips. This way, a destination's marketing prospects will be enhanced (Boes et al., 2015; Buhalis & Amaranggana, 2014; Zhang et al., 2018).

To mitigate some negative economic consequences the reduction of tourists would have on destinations, the PIRT model proposes the inclusion of a souvenir service system where a destination's cultural artifacts or souvenirs can be bought online and delivered to the tourist (Fennell, 2020). In addition, extra fees for maintenance, destination infrastructural development, conservation, or local support programs are proposed to be included in the overall charge. However, these fees would not be unlike fees charged at other ecotour areas for the same purposes (Fennell, 2020).

Like all virtual tour models, the most significant shortfall of PIRT is the tourist's inability to experience the destination, its people, nature, and other elements in person (Fennell, 2020). In ecotourism, this shortfall is crucial as a tourist's personal holistic interaction with all aspects of the destination forms an essential component of the tour experience (Fennell, 2020; Fennell & Cooper, 2020). Nonetheless, the model addresses other notable aspects of ecotourism, including education, sustainability, conservation, economic improvement, and ethical concerns (Wang et al., 2012; Liberato, Alen & Liberato, 2018).

The PIRT innovation can be regarded as a sustainable digital development tool as it promises destination protection, conservation of resources through reduced impacts of overtourism, real-time interactions and interpretations, tourist satisfaction, community benefits, and geomarketing opportunities (Fennell, 2020). However, to ensure the practical application of PIRTs toward achieving SDGs, it is essential to analyze their resourcefulness to tourism operations.

2.3.4 The Innovation Journey of PIRTs

Operationalizing innovations involves taking them through stages of initiation, implementation, and termination (Schroeder et al., 1986). Through these stages, also referred to as the innovation journey, entrepreneurs engage in a sequence of events to transform a new idea into an implementable reality (Van de Ven et al., 1999). The innovation's drivers, limitations, infrastructure, management, and adaptability are also assessed (Cheng & Van de Ven, 1996). Earlier research on innovation journeys in the

manufacturing industry, which date back to the 1980s and 1990s, reveal sequential stages of invention, development, testing, and launching (Van de Ven et al., 1999). Since then, several authors have developed innovation journey frameworks to show the development and evolution of innovations with users and the contexts within which their interactions occur (See, for example, Groen et al., 2008; Oeij et al., 2019; Voorberg, Bekkers & Tummers, 2015).

Despite the uniqueness of all innovation journey frameworks proposed, Van de Ven (1986) encapsulates their fundamental processes into a framework that shows the complex interactions between actors and innovative ideas across three key stages, namely: initiation, development, and implementation or termination periods. He notes a gestation period preceding the initiation stage, where internal and external shocks trigger ideas and plans to obtain resources for innovation development (Van de Ven, 2017). This stage is followed by the development period, where efforts are made to translate the innovative idea into a concrete reality. According to Van de Ven, the development stage sees the wealthiest number of interactions as the initial innovation idea proliferates into several other ideas that take different paths in an iterative way. At this stage, setbacks, mistakes, and external events potentially alter the innovation's basic assumptions and bring the success criteria for testing the invention into question. Actors such as inventors, stakeholders, and innovation managers are challenged, at this stage, to review and make decisions or fix emerging problems (Oeij et al., 2019; Van de Ven, 2017). Activities of competitors, government regulatory bodies, and trade organizations also come to play to hinder or support the development and possible implementation of innovations (Cheng & Van de Ven, 1996; Oeij et al., 2019). These factors set the tone for an implementation or termination stage where the innovation is adopted or rejected (Van de Ven, 1999).

Van de Ven's model has mainly been applied to technological innovations in the past. However, researchers such as Oeij et al. (2019) have begun exploring their application in social contexts. The proposal to implement PIRT innovations in NPAGG destinations can be situated within the gestation and initiation stage of Van de Ven's framework. Here, the idea of promoting the tourism industry's resilience through virtual tourism innovations in the face of disruptions brought on by Covid-19 can be aligned with the open innovation concept of Dabrowska et al. (2019). The underlying essence of sustainability can both serve

to improve innovation in the region while managing tourism consumption and resource exploitation activities (Zobel & Hagerdoorn, 2018).

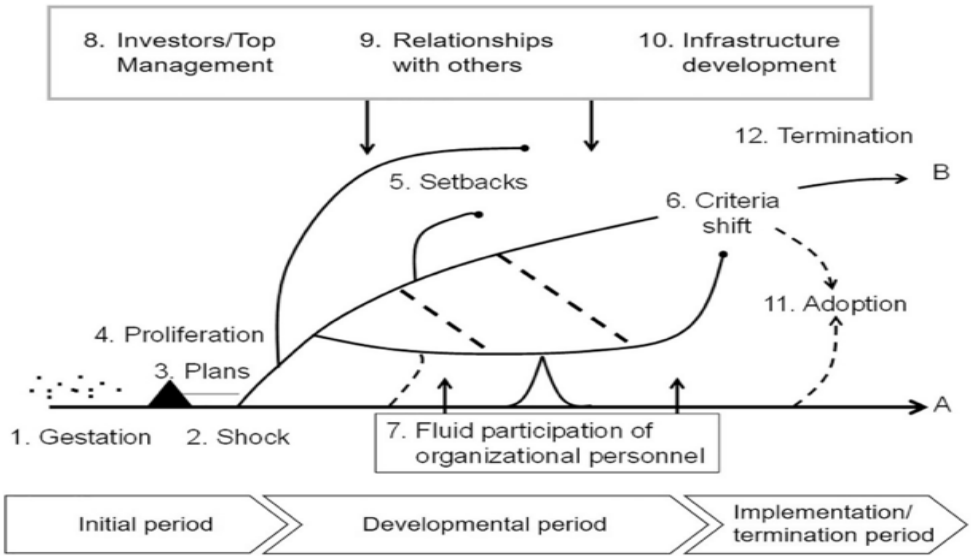
Dabrowska et al. (2019) observed that factors such as accessibility to resources, unique production processes, and underlying technological aids have been major driving forces that keep businesses active even through periods of dramatic changes and disruptions. What sets such companies apart from their counterparts who fail in similar circumstances include their responses to the conditions of organizational rigidity and the success syndrome (O'Reilly & Tushman, 2013). To overcome the rigidity trap, Dabrowska et al. (2019) propose incorporating open innovation and organizational ambidexterity in business operations. These two affiliated schools of thought can open firms up to opportunities for renewal, knowledge transfer, transformation, and full exploitation of a firm's capacity.

Innovation processes speak to the complexity of managing innovations (Van de Ven, 2017). Oeij et al. (2019) infer that the heterogeneity of customer demands also add diverging effects to innovation paths. As such, meeting customer demands stimulate open innovation. The innovation process for the tourism and services sector is thus regarded as open and dynamic due to the integral involvement of customer interaction aspects. This is especially pertinent as developments in the industry are usually a reaction to changes in the demand profile of consumers, customer preferences, environmental conditions, or social imperatives (Liburd & Hjalager, 2016).

For this reason, understanding not just the role of PIRT innovations in tourism transformation but how consumers might react to them in post-Covid times is vital in steering the course of development and sustainability. Attention is given to the needs of customers because, without them, a service will not be produced in the first place. An innovation is mostly successful if its aims are compatible with the demands of consumers. (Sampson & Froehle, 2006). Haahti and Komppula (2006) reaffirmed this by proposing an initial assessment and identification of the demands of target consumer segments in order to ensure that innovations meet their changing needs. Cohen et al. (2014) cautioned that these needs should be established through cooperation in buyer-supplier relationships and addressed in socially, environmentally, and economically responsible ways.

Figure 2.2

Interaction of components in Van de Ven's innovation framework (Van de Ven, 1986



2.3.5 Smart Tourism and the Millennial Alternative Hedonist

COVID-19 has revealed deep environmental and structural inequities that stand to be exacerbated by climate change and other global challenges (Sigala, 2020). Although the tourism industry is buffeted by these challenges, the development of resilient measures by industry stakeholders, coupled with environmental and socially responsible consumption on the part of tourists, promises hope for more sustainable tourism futures (Higgins-Desbiolles, 2020).

Of the restorative innovations proposed for tourism recovery against Covid-19, the PIRT model has been earmarked as a suitable intervention for disrupted tourism production and consumption systems, and as a responsible alternative to conventional travel. According to Hollaway (2002), technological mediations can foster ethical relationships by extending care relations across distances. He notes that such ethical relationships "emerge from networks of the heterogeneous assemblages within which they are constituted. They are relational ethics arising from associations and encounters between

distanced things" (Hollaway, 2002; p78). Ethical tourism consumption through PIRTs can thus serve to shrink psychological distances while establishing a relational ethic of care towards human and non-human agents within tourism supply chains (Goodman, 2004).

The creation and use of PIRTs align with SDG 9, which calls for building resilient infrastructure, promoting sustainable industrialization, and fostering innovation for development. The PIRT VT model fits this context as an environmentally friendly innovation that offers benefits of safety, accessibility to tourists, employment and entrepreneurship, income generation, and contributes to the conservation of natural resources (Fennell, 2020). However, despite its advantages, the model misses out on offering the unique experience of "being," which is arguably the most cherished aspect of tourism and travel. Herein lies the challenge for the Millennial tourist who has a penchant for experience (Cavagnaro et al., 2018). What then become the factors that Millennials might consider in reconciling their innate desires for experience with their inclination toward technology in the tourism consumption process? Moreover, as innovations are usually a reaction to consumers' preferences, environmental conditions, or social imperatives (Walder, 2006), the degree of acceptance of such innovative change would depend on how they meet the physical, social and affective needs of users. Therefore, understanding how Millennial students respond to the PIRT model's shortcomings and advantages is an important consideration for future consumption outlooks.

2.4 Post-Covid Tourism Consumption in NPAGG

2.4.1 Background to the Development of UNESCO Global Geoparks (UGGps)

The United Nations Educational, Scientific and Cultural Organization (UNESCO) describes geoparks as geographical areas that host landscapes of unique geological features of international significance, and are managed holistically for the purposes of protection, education, and sustainable development (UNESCO, 2021). In other words, geoparks comprise regions with relevant geo-sites which favor economic and local development through sustainable tourism, preservation of cultural and natural resources, and providing avenues to meet educational objectives (Rodrigues et al., 2020). The presence of

outstanding geological features and landscapes is fundamental for the development of geotourism in an area (Dowling, 2013). However, the cultural and aesthetic values of geoheritage are recognized as essential supporting factors for geotourism, and the delivery of its objective of promoting better awareness and understanding of geoheritage and conservation through sustainable activities (Chen et al., 2015).

In 1997, UNESCO developed the geopark concept to address the conservation of significant areas of cultural, historical, and environmental interests (Farsani, 2014). The development led to the establishment of a Global Geoparks Network (GGN) in the early 2000s to serve as a platform where geological and heritage initiatives would benefit from global networks of exchange, cooperation, and support through their memberships (Hose, 2012; UNESCO[16], 2021). Since then, governments and communities have adopted the geopark concept to manage areas of geological wonders within their territories against excessive consumption, depletion, and destruction by human activities (Farsani et al., 2014).

One major hallmark of UGGps is their contribution to sustainable regional promotion through geotourism, geoeducation, and geoconservation strategies developed and promoted in collaboration with local communities (Duarte, 2020; Farsani, 2014; Newsome & Dowling, 2018; UNESCO, 2021). Established as "bottom-up" initiatives, UGGps highlight the uniqueness of local traditions, encourage the transmission of regional heritage, and enhance Indigenous connections and knowledge for resilience and peacebuilding (UNESCO, 2021).

To receive a UNESCO global geopark designation, a geopark's characteristics must be consistent with the following factors: (a) Its geological heritage must have an international value; (b) The site must promote sustainable local economic development through geotourism (c) There must be established management plans to cater for the economic and social need of local populations, protect the landscape in which they live and conserve their cultural identities; and (d) The site must collaborate with local populations,

[16] UNESCO. (2021). UNESCO Global Geoparks & Sustainable Development. Geoparks Fundamental Features, Our Commitment to the Sustainable Development Goals. Available online: https://en.unesco.org/global-geoparks/focus#sdg

regional and national networks, international partners and other UNESCO global geoparks for development and peacebuilding (CCUNESCO, 2020). Geoparks are evaluated every four years to ascertain their achievements and progress in these areas. The incorporation of local community support and a bottom-up approach to conservation would ensure that geoparks remain areas with strong regional identity, heritage promotion, and sustainable development opportunities derived from their natural and cultural characteristics (Ferreira & Sánchez-Martín, 2022).

2.4.2 Contribution of Geoparks to Sustainable Tourism

The concept of sustainability has been regarded as a product of questioning the impacts of human actions on planetary and human resources for several years (Fennell & Cooper, 2020). Three landmark events in 1972 have been highlighted to set the pace for stakeholders to reconsider people's rights toward healthy and productive environments (Dangi & Jamal, 2016; Fennell & Cooper, 2020). They were the United Nations (UN) Conference on the Human Environment in Stockholm, the publication of the Limits of Growth by Meadows et al. in 1972, and the United Nations Educational, Scientific and Cultural Organization (UNESCO) Convention on the Protection of World Cultural and Natural Heritage.

The idea of sustainable development suffers definitional problems, as various fields describe the term within different contexts and biases. A comparison of all definitions is beyond the scope of this paper. Yet amongst notable interpretations and contentions about inherent ambiguity, Sharpley (2000) suggested that future interpretations must align with the fundamental principles of development and sustainability, as well as highlight resource equity for all, futurity or continuance of global ecosystems, and a holistic approach to global environmental issues (see also Fennell & Cooper, 2020).

In the last few decades, the concept and principles of sustainability have become widely accepted and applied in the tourism sector as concerns about the industry's impact on communities, natural and cultural resources continue to increase (Krippendorf, 2010; Paskova & Zelenka, 2018). A shift towards sustainable tourism consumption and

production processes is thus recognized as the best chance to reconcile sustainable development parameters in ecological, socio-cultural, and economic terms (Fennell & Cooper, 2020). In aligning tourism with the tenets of sustainable development, the WTO (1993) defines sustainable tourism development as tourism that meets the needs of present tourists and host regions while protecting and enhancing opportunities for the future.

In the framework of the 2030 agenda for Sustainable Development through the Sustainable Development Goals (SDGs), sustainable tourism is focused on the exploration of tourism as a catalyst for positive change in terms of business practices, policies, consumer behavior, and the opportunities it can bring to local communities and destinations (Hall, 2019). Officially themed as Transforming our world: the 2030 Agenda for Sustainable Development, the SDGs - comprising 17 global goals and 169 targets – are a set of intergovernmental agreements that match and improve on the 2015 development agenda and Millennium Development Goals (MDGs).

In 1999, the OECD published notes from a roundtable discussion on "Regional Policy and Tourism" to highlight the connection between regional development and tourism (Jones et al., 2011). They noted that although tourism was a significant growth sector in many economies, future possibilities for sustained economic development were not without challenges. Notable among such challenges were increasing awareness of the social impacts of tourism growth, supporting tourism as a tool for sustainable territorial development, and revitalizing slow-growth destinations while encouraging the upgrading of less developed destinations into competitive regions. Arguably, geoparks have served the purpose of meeting such challenges today (Catana & Brilha, 2020).

Following its earlier inception in Europe, the geopark concept has gained worldwide recognition by emphasizing geotourism as a means of contributing to local economic sustainability (Ferreira & Sánchez-Martín, 2022). Nature, earth history, landscape, and a region's cultural traditions provide the necessary ingredients for developing geotourism (Dowling & Newsome, 2018). As such, many geoparks are established within existing natural areas.

Geopark development has paralleled tourism growth over the years. The growth is presently reflected in the 177 officially designated UNESCO Global Geopark sites in 46 countries worldwide (UNESCO, 2022). Although a more significant number of these sites

are concentrated in Europe and Asia, a growing understanding of the essence of geoparks has led to the development of new projects in Africa, the Arab States, and the Americas (Herrera et al., 2021). In the last decade, geoparks have implemented and advanced holistic tourism experiences by combining leisure, adventure, enjoyment, information sharing, and education.

Besides relying on spectacular landscape features to attract visitors, geotourism has become an emerging form of tourism with an educative function (Lee & Jayakumar, 2021). Guided excursions provide visitors with adventure whiles offering insights into a destination's history and characteristics (Catana & Brilha, 2020). Presentations of traditional music, dances, food, cultural artifacts, storytelling, interactions with local people, and tourist engagement in local activities form an essential component of the tourist education process (Shekhar et al., 2019). For example, Naturtejo Geopark includes panning for gold and the chance to "strike- it- rich" as one of the many exciting activities offered to tourists (Rodrigues et al., 2021). Newly emerging geotourism destinations such as the Northwest Island Geopark in Scotland, the Nature Park Styrian Eisewurzen in Austria, and the Niagara Peninsula Aspiring Global Geoparks also serve as outdoor laboratories for schools and significant learning areas during field trips.

In Canada, the involvement of Indigenous partners in the development, management, and promotion of Geoparks has fostered respectful relationships and increased collaborations among Indigenous people. The impact of this is seen in the boosted participation of Indigenous people in the reconciliation process and the promotion of local culture in significant ways (CCUNESCO, 2020). The Canadian Commission for UNESCO comments that the benefits of tourism infrastructural development, conservation, and education offered through the various geoparks to their host communities prove that the natural environment and local economic development can thrive together (CCUNESCO, 2020).

Apart from major geopark development networks like UNESCO, some countries such as Italy, Japan, and France have developed national and local geoparks to promote close collaboration among geoparks, tourism sectors, schools, and businesses within their respective regions (Rodrigues et al., 2021). The creation of such local networks is hinged on the fact that Geopark developments provide avenues for job creation and overall

economic benefits to local communities, in addition to diversifying a destination's tourism components (Lee & Jayakumar, 2021). Local tourism service providers and businesses such as hotels, restaurants, artisans, information centers, tour guiding services, and destination marketing agencies provide employment opportunities and grounds for involving local people in the sustainable development of their territories through tourism (Farsani et al., 2014). The contributions of UGGPs to the UN SDGs have been mainly linked to SDGs 1, 4, 5, 8, 9, 11, 12, 13, and 17, as shown in Table 2.1

Table 2.1

Contribution of geoparks to SDGs. Adapted from UNESCO, 2016

SDG icon	Goal	Contribution of Geoparks to related targets
	End poverty in all its forms everywhere	***Target 1.5.*** Disaster risk reduction is essential to end poverty and foster sustainable development. The bottom-up approach of the UGGps reduces the vulnerability of local communities to extreme events, other shocks, and disasters through active risk awareness and resilience training.
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	***Target 4.7*** UGGps enhance scientific and cultural education for both local communities and tourists at various stages. UGGps are regarded as outdoor classrooms and incubators for sustainable development, sustainable lifestyles, appreciation of cultural diversity, and the promotion of peace.
	Achieve gender equality and empower all women and girls	***Target 5.5*** UGGps strongly emphasize women's empowerment through educational programs and the development of women's cooperatives. Such cooperatives provide opportunities for women to obtain additional income, hone their leadership skills, and contribute to growth in their areas of society.
	Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all	***Target 8.9*** Promoting sustainable local economic development through sustainable (geo)tourism is a key tenet of UGGps. This creates job opportunities for the local communities through tourism, but also the promotion of local culture and products.
	Build resilient infrastructure, promote sustainable industrialization, and foster innovation	***Target 9.5*** UGGPs offer opportunities for promoting scientific research, upgrading the technological capacities of tourism sectors in all countries, and encouraging innovation.
	Make cities and human settlements inclusive, safe, resilient, and sustainable	***Target 11.4*** Protecting, safeguarding, and celebrating cultural and natural heritage can be established through holistic approaches of UGGps. This way, UGGPs contribute to boosting a sense of pride and identity among local people.

	Ensure sustainable consumption and production patterns	***Target 12.8*** UGGps promote education and awareness of sustainable lifestyles and practices. They teach local communities and visitors to live in harmony with nature.
	Take urgent action to combat climate change and its impacts	***Target 13.3*** UGGps hold records of past and present climate data. Through educational activities, awareness of climate change issues is raised, and people are provided with the knowledge to mitigate or adapt to its effects.
	Strengthen the means of Implementation and revitalize the global partnership for sustainable development	***Targets 17.6, 17.9, and 17.16*** The development and management of all UGGps involve cooperation with both local people within an area as well as international stakeholders through regional and global networks. The networks ensure collaboration across communities and borders where stakeholders share knowledge and expertise, and develop mutual understanding. This nurtures cooperation and peacebuilding.

2.4.3 The Niagara Peninsula Aspiring Global Geopark (NPAGG)

Given its inherent benefits of sustained cultural, economic, and environmental development, great importance has been attached to geo-heritage protection through geopark development in various provinces across Canada (Miller, 2018). The Canadian Geopark network (CGN), which is the umbrella organization overseeing geopark development, information sharing, and education presently lists five geoparks, namely: Stohenammer in New Brunswick, Percé in Québec, Tumbler Ridge in British Columbia, Discovery in Newfoundland and Labrador, and Cliffs of Fundy in Nova Scotia as part of its network (CCUNESCO, 2020). In line with UNESCO goals, Canadian Geopark destinations are noted to enhance sustainable tourism, encourage environmental resource protection, and contribute to research in academic fields such as the Earth Sciences, Geography and Tourism (Dowling & Newsome, 2018). They also promote appreciation of geological, cultural, and archeological heritage and the history of destinations to visitors (Miller, 2018).

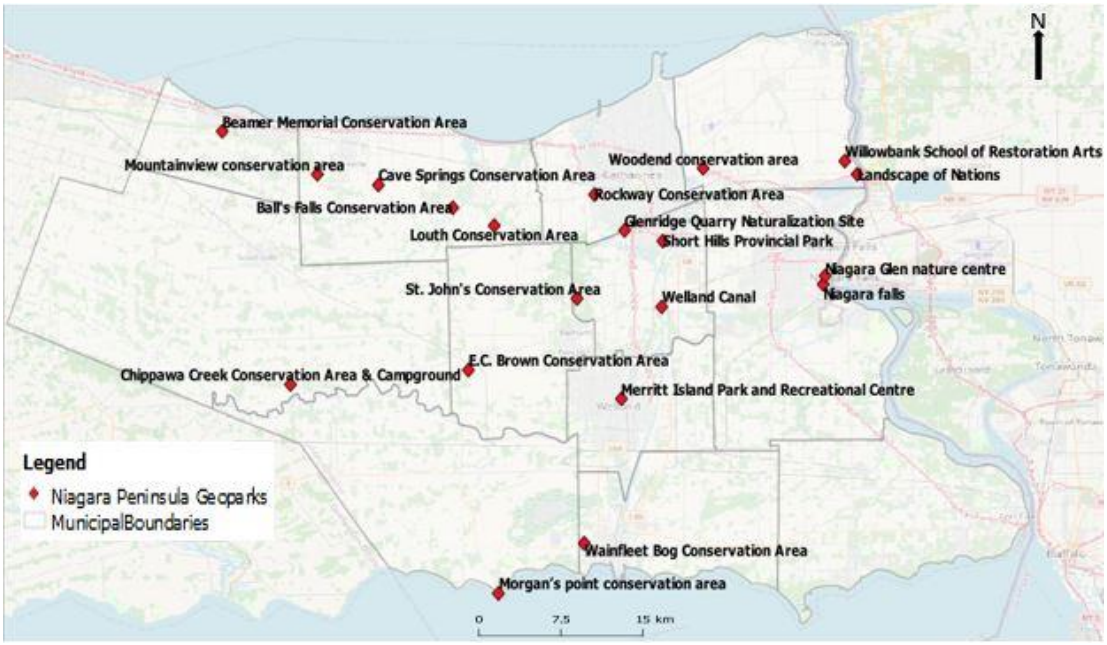
The Niagara Peninsula Aspiring Global Geopark (NPAGG) initiative aims to develop the Niagara region as an international Geopark destination for Geotourism (Phillips, 2019). The project is inspired by the potential of geotourism to stimulate economic activity, cultural and natural heritage preservation, education, and regional research (Philips, 2019; Brouder & Fullerton, 2015). Building off connections between centuries of Indigenous histories, lifestyles, and 500 million years of geological formations, NPAGG sites will tell stories of how the peninsula's underlying geology has shaped the region's unique Indigenous cultural heritage. Thus, the initiative intends to foster collective pride in Niagara's cultural, Indigenous, environmental, agricultural, and industrial heritage (NPAGG, 2022). The Niagara Peninsula has been home to many Indigenous Nations and People who continue to thrive across all areas of society until this day. The geopark's strong collaboration with Indigenous people throughout its development is a respectful acknowledgment that resources, advantages, and stories on which geotourism thrives are directly related to the friendship of Indigenous people (Phillips, 2019).

Set to become Canada's next official UNESCO Global Geopark in 2023, the NPAGG offers a chance to boost Canadian geotourism by driving the emergence of a new tourism market that ties together the preservation of geological heritage with education and territorial development (NPAGG, 2022). A vital benefit of this endeavor would be the establishment of special interest in and awareness of the unique environment, culture, and histories of destinations in which the geoparks are situated (Heritz, 2021). The move is meant to boost potentials to draw visitors to the various geo sites in the region, as well as to more remote and subtle attractions the area has to offer other than Niagara Falls (Brouder & Fullerton, 2015). Currently, there are twenty-one (21) geopark destinations under NPAGG, as shown in Figure 2.3.

To characterize the potential contribution of NPAGG to the 2015-2030 sustainable development goals, the Niagara Geopark Board writes that the NPAGG has been set up as a non-profit entity to benefit all residents, businesses, and educational institutions in the region. The establishment seeks to foster a hyper-local form of tourism, developed in such a manner and at such a scale that it remains viable indefinitely while safeguarding the earth's life support systems on which the welfare of current and future generations depends (Fennell & Cooper, 2020; NPAGG 2022).

Figure 2.3

Map showing locations of NPAGG destinations



2.4.4 Digital Development for NPAGG

Most research on the incorporation of innovations in geotourism have studied GIS and mobile technologies for map and trail development, digital monitoring innovations, laser scanning, and 3D modeling technologies (Johnston & Kranendonk, 2018). Other studies report the use of digital applications and technologies to enrich geotourism experiences in places such as the Sesia Val Grande UGGp (Perotti et al., 2020) and the Psiloritis UGGp in Southern Greece (Fassoulas et al., 2019). Similar applications for geointerpretation and geoeducation are also implemented in geoparks in Asia (Kim & Lim, 2019). Of these developments, Gentilini et al. (2015) remarked that the Magma UGGP in Norway, under the 2015 GEOVisual Project, was possibly the first of its kind to introduce virtual reality innovations for the interpretation of geological phenomena.

The benefits of digital innovations in geoparks for heritage interpretation, communication, and promotion are apparent in the degree of flexibility they offer. As such technologies are often cloud-based, online, and supported on several mobile devices, they

allow flexibility in being used remotely or in situ (Fassoulas et al., 2019). These features also make them highly adaptable and easily modified or updated. The incorporation of interactive, user-friendly features also makes them suitable for training. Although the use of digital technologies in geoparks was initiated before the pandemic (see Cayla, 2014), their application became even more pertinent with the unexpected onset of Covid-19-driven needs for flexibility and adaptation for both human well-being and business continuation (Fassoulas et al., 2019).

In an impact assessment of Covid-19 on tourism, Martini et al. (2021) revealed that UGGps which depended on geotourism for their sustainable development were among the most affected forms of tourism during the pandemic. Mobility restrictions which led to the suspension of tourism activities and services offered in geotourism destinations meant reduced income for the management of those sites, and a loss of connection between geoparks, visiting tourists, and stakeholders (Martini et al., 2021). As a solution, some geoparks have proposed the development of new digital services and initiatives to enhance communication, sustain geotourism and promote local products within their territories (Quesada-Román et al., 2021).

Along these lines, some studies affirm incorporating sustainable digital development in destinations like NPAGG to guarantee the geoparks' alignment with the sustainable development goals of UGGps. Sparviero and Ragnedda (2021) define sustainable digital development as the creation and adoption of new technologies connected with values that serve sustainable development outcomes. They emphasize that destinations can achieve digital sustainability by considering individuals' access to and use of digital technologies in conjunction with the social, economic, and environmental goals of sustainable development (Farsani et al., 2014; Fassoulas et al., 2019). In other words, a sustainable future is more likely if the production and consumption patterns of digital innovations encourage social, economic, and environmental benefits to societies.

2.5 Conceptualizing the Study in Ostrom's SES Framework

The unprecedented nature and scope of the ongoing pandemic, along with its severe impacts on mobility, travel behavior, and tourism systems, necessitate effective adaptation strategies that encourage immediate tourism continuity and long-term sustainability. (Broudah et al., 2020). Walker & Salt (2012) describe this means of adaptation as resilience thinking. Resilience thinking emphasizes innovation and adaptability, wherein actors in a system develop or enhance their abilities to adapt to change or work harmoniously in the event of social, economic, or ecological interferences (Holladay & Powell, 2016; Walker & Salt, 2012).

In tourism, the resilience of a destination or business has been determined by its ability to respond quickly to disturbances and restore stability (Chebli, Othmani & Said, 2020). But some authors of resilience studies, such as Dwyer (2005), argue that short-term resilience thinking undermines long-term value maximization in sustainability frameworks. In response, researchers like Espinar et al. (2017) and Knowles (2019) present an alternative critical view for thinking of resilience as a long-term processual change that parallels the concept of sustainability. They highlight that such a resilience-first approach helps to boost adaptive capacity in areas of immediate objective prioritization while supporting future opportunities and innovation.

Recognition of the roles and dynamic interactions of actors towards immediate resilience and long-term sustainability of social and ecological systems have been captured by some studies under Ostrom's socio-ecological systems framework (See, for example, Rounsevell et al., 2012; Côte & Nightingale, 2011). Ostrom's SES concept draws on the notion that all humanly used resources are embedded in complex social and ecological systems. Such systems are composed of multiple subsystems, such as resource systems, resource units, users, and governing systems within which relatively separate variables interact to produce outcomes across spatial or temporal levels (Ostrom, 2009; Rounsevell et al., 2012).

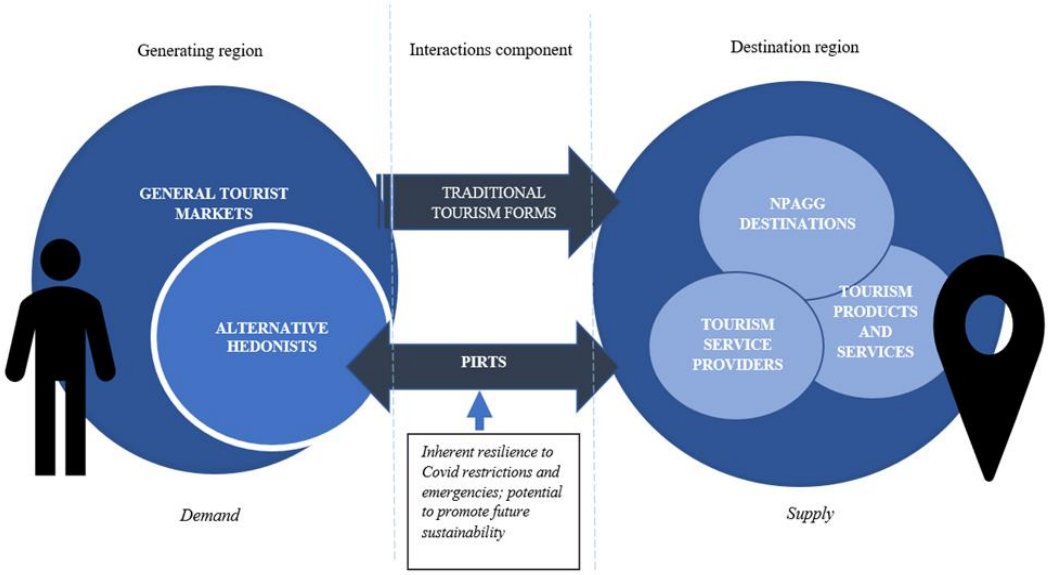
Socio-ecological systems (SES) emphasize the integration of "humans-in-nature" perspectives in systems where social, technological, ecological, cultural, and other components are strongly linked (Rousevell et al., 2012). The concept fundamentally relies

on assumptions that humans have the ability to make conscious individual or collective choices that produce significant differences in outcomes. These choice processes may not necessarily conform to specific decision-making policies, nor yield intended results, thereby making way for adaptation (McGinnis & Ostrom, 2014). Characterized by relationships and interactions, SESs are observed to rely on feedback. They are relational in the sense that outcomes of component interactions, in turn, affect the subsystems from which they emanate (Ostrom, 2009).

In the context of tourism consumption and innovation use in the aftermath of the pandemic, the current research adopts three main components of Ostrom's (2009) framework to reflect the interconnected relationships between resource systems and actors towards resilience, as shown in Figure 2.4. The framework developed in this study captures interactions between tourists (Millennial students), technological innovations (PIRTs), and tourism destinations (NPAGG) as inspired by the pandemic under three main components: users, technological systems, and resource units, respectively. Users are categorized under the generating origin component of the framework; NPAGG tourism is aligned with destination resources; whiles PIRTs and other forms of tourism fall within the interaction component of the framework. The interactions component becomes the means through which tourists consume a destination's tourism product on the one hand, as destinations offer their services to tourists on the other. An ethical concept (alternative hedonism) is introduced as a condition that can potentially influence people's preferences for PIRT tourism forms as they engage with NPAGG destinations. Alternative hedonism is analyzed as the variable that describes tourists' decisions to choose PIRTs for collective ecological good despite the innovation's shortcomings.

Figure 2.4

Conceptualizing the Study in Ostrom's Socio-ecological systems framework.



CHAPTER 3 – METHODOLOGY

This chapter describes the methods used in analyzing Millennial tourists' travel preferences in the post-Covid era, the role of PIRTs in meeting those preferences, and how this translates into innovation developments for NPAAG. The research design, study area, population, data collection, and data analysis methods are presented in the following pages.

3.1. Research Design

In this exploratory case study, a survey questionnaire was used to collect qualitative and quantitative data from respondents. Surveys have been applied in several tourism studies to gauge consumers' perceptions of products, service delivery, and performance, and to assess product quality (Dwyer et al., 2012). Case study research procedures are applied to examine in-depth issues regarding people, situations, or groups in real-world contexts (Hammond & Wellington, 2020). Yin (2003) describes case studies as the systematic, intensive investigation of individuals, communities, groups, or other units in which the researcher is interested. A case study enables researchers to analyze complex phenomena by narrowing them to manageable research questions which identify the "why" and "how" of a research idea that can have generalizable outcomes (Yin, 2003).

As such, the techniques employed in this exploratory study were designed to develop ideas and questions that may be explored in future research rather than to test hypotheses. The study sought insight by collecting and analyzing observations about respondents' experiences with Covid-19 and how these potentially influence their future tourism patterns. This is because the impacts of Covid- 19 on people's future tourism preferences lack established theory as the phenomenon is new. The onset of a global pandemic of this magnitude and its unprecedented impact on tourism is a distinct phenomenon from what the industry has been met in times past. Despite the abundance of past research on pandemics and tourism, there is a current research gap on the connection between Covid-19, Millennial travel preferences, and the mediating role of VT innovations

like PIRTs. Even as the study draws from the fields of innovation, ethics, and sustainability, focusing on gaining a preliminary understanding of the Millennial population's preferences in the contexts of geopark tourism offers prospects of generalizing in the broader ecotourism sector and forms the basis for future research into the subject matter.

This research is situated within the pragmatic research paradigm, which advocates selecting the most appropriate method for studying a phenomenon instead of aligning with solely dichotomized positions of positivist or interpretivist paradigms (Alise & Teddlie, 2010). Characterized by a selection of research methods that are deemed to be most appropriate for studying a phenomenon at hand, the pragmatic paradigm encourages the consideration of all useful methods to facilitate understanding of a situation (Biesta, 2010; Kivunja & Kuyini, 2017).

The pragmatic paradigm (a) follows a relational epistemology; (b) includes an axiological position wherein research is intended to benefit people or society; (c) allows a non-singular reality ontology in which individuals' unique interpretations of reality are acknowledged; and (d) allows for the combination of both quantitative and qualitative research methods (Kivunja & Kuyini, 2017). This paradigm has given rise to research methodologies such as case studies, action research, ethnographies, narrative inquiry, casual comparative, and quasi-experimental methods (Kivunja & Kuyini, 2017).

3.2 Study Area

The study was conducted in the Niagara region in Ontario. With a land area of 1,854.23 square kilometers, the region is home to about 450,000 residents in its 12 municipalities. The Niagara Region hosts popular attractions such as Niagara Falls, the butterfly conservatory, historical museums, and luscious grape farms. These attractions draw over 13 million visitors each year. With about 2,800 tourism businesses creating jobs for over 40,000 people, tourism is regarded as an important economic activity and a significant income earner (Tourism Niagara, 2021).

In pre-pandemic times, the Region boasted annual domestic tourist arrivals of over 13 million people, over 3 million travelers from the United States, and approximately 1 million overseas travelers. Annual tourist spending of about USD 2 billion significantly impacted the local economy, with every USD 100 million increase in direct tourism revenue yielding an indirect output of USD 69 million (Niagara Economic Development, 2022). Major tourism businesses in the region include Falls View Casino Resort, Great Wolf Lodge, The Outlet Collection, Greg Frewin Theatre, Scotiabank Convention Center, and Niagara Parks. The momentum for growth continued well into the beginning of 2020, with the overall regional economy showing great potential for further growth.

The progress was, however, abruptly stalled by the onset of the Covid-19 pandemic. A report on Covid-19s impact on businesses by the Niagara Economic Rapid Response Team (ERRT, 2020) revealed staff layoffs, staggering loss of revenues, and anticipated slow recovery of business and customer numbers. The authors of the report described the impact as "significant and challenging, with no real precedent in the region's history" (ERRT, 2020; p. 2). Although all sectors experienced adverse effects of the pandemic, businesses in the accommodation and food service sectors recorded disproportionately high levels of attrition. This had repercussions on Niagara's GDP as the region relies heavily on tourism-related industries. The authors again noted that post-pandemic recovery would require a wide range of support and resources from governmental partners, businesses, and industry stakeholders.

For a region heavily reliant on tourism for employment, GDP contribution, and economic growth, the current NPAGG initiative aimed at developing Niagara as an international Geopark destination (Phillips, 2019) promises opportunities for a rebound and growth of the region's economy. The project is expected to draw more visitors to attractions other than Niagara Falls and give tourists a reason to stay longer (Brouder & Fullerton, 2015). NPAGG destinations comprise urban, nature-based, cultural, and rural destinations which have the potential to stimulate economic activity, cultural and natural heritage preservation, education, and research in the region (Philips, 2019; Brouder & Fullerton, 2015).

3.3 Population

The target group for this study comprised Millennial students between the ages of 18 and 30. The Millennial generation was selected due to their overlapping interests in technology, tourism, environmental stewardship, and conscious consumption (Corbisiero & Ruspini, 2018). This generation segment is of particular interest to Niagara's geopark tourism and economic development at large (Phillips, 2019) as they represent the region's present and future tourist markets and human resources (McAdams et al., 2021).

As a generation evolving through major global crises and digital connectivity, Millennial populations present complex needs and opportunities that current and future tourism offerings must align with. Brock University students are a relatable group with interests, market, and workforce potentials that align with the region's geopark goals.

3.4 Sampling

The study sample was selected on a non-probability basis, specifically using the convenience sampling technique. Non-probability sampling is considered an appropriate sampling technique for exploratory studies as it enables researchers to develop an initial understanding of a small or under-researched population of study (Lavrakas, 2008). The convenience sampling method, also known as haphazard sampling, is a non-probability sampling technique where subjects who meet specific practical criteria are chosen based on their convenient accessibility and proximity to the researcher (Thetsane, 2019).

In convenience sampling, the researcher does not necessarily select a sample that is representative of the entire population. Selection is based on obtaining readily available participants (Etikan et al., 2015). The method does not require a random selection of samples based on any specific criteria (Thetsane, 2019). Hence, the approach is fast, convenient, and economical, as a large number of questionnaires can be distributed and completed within a given time.

During the data collection process, Covid-related mobility restrictions and school closure made access to samples of university students challenging using other methods. The convenient sampling technique was thus deemed appropriate for this study as it

enabled me to reach an easily accessible population. Respondents were drawn from the Brock University undergraduate and graduate-level populations. This group was considered likely to exhibit the required Millennial age characteristics and be easily accessible for the study.

3.5 Data Collection

Data for this study was collected using a survey questionnaire hosted on the Google Forms platform. Due to ongoing Covid-related contact restrictions during the survey period, data was collected through the online medium to ensure compliance with health regulations and the safety of participants.

3.5.1 Primary Data - Survey Questionnaire

After reviewing the literature and completing ethics approval, a survey questionnaire was created and published online on February 4th, 2022. Following its use in previous studies to assess attitudes, opinions, preferences, procedures, and practices (Seixas, 2017), the descriptive survey research design was deemed appropriate for this study. About 30 survey questions hosted on the google forms platform comprised nominal, Likert type, numeric rating scale, and open-ended questions. Likert-type items were appraised on a five-point scale due to their effectiveness in capturing degrees of opinions with relative ease, as well as their extensive use in attitudinal research (Simms et al., 2019). Open-ended questions were included to offer a qualitative perspective to the survey. This allowed for the exploration of other underlying factors that influenced respondent answers to closed-ended survey questions.

Questions were segmented into four main categories and took approximately 15 minutes to complete. The first section assessed consumers' experience of Covid-19 and its influence on their future travel preferences or behaviors. These questions aligned with research objective 1, which posited that the Covid-19 pandemic might influence people to

rethink their consumption patterns and decisions toward more responsible tourism experiences. This part of the survey also sought to answer research questions 1 and 2.

Questions under the second section of the survey assessed respondents' perceptions of virtual tours, specifically PIRTs, as a favorable surrogate to conventional tourism in the aftermath of the pandemic. Survey questions were in line with objectives 2 and 3, which aimed to identify virtual tours as an alternative form of tourism in which consumers were likely to engage during the post-Covid era. They also sought to ascertain the factors that influenced Millennials' travel choices. Questions in this section were tailored to address research question three. Section three of the survey analyzed how tourists' travel choices might influence or inspire the use of virtual tourism innovations in Niagara's geopark destinations. These were accordant with objective four and sought to answer research question four.

3.5.2 Secondary Data Sources

Data sources for maps were obtained from the Niagara Open Data websites. An area shapefile representing the 12 municipal boundaries of the entire Niagara region, along with latitude and longitude coordinates to represent point data for geopark locations, were also sourced from the Niagara open data website. The data was plotted in QGIS software to map regional geopark locations.

3.6 Data Analysis

Data analysis followed a multi-stage process. First, questionnaire responses were transferred from the Google spreadsheet and coded into the Statistical Package for the Social Sciences (SPSS, version 25) for processing and analysis. SPSS was chosen due to its popularity in academic fields, as it provides many techniques for data transformation, analysis, and output (Allen, Bennett, & Heritage, 2014). Its application enables researchers to obtain statistics ranging from simple descriptive numbers to complex analyses of multivariate matrices.

For nominal and Likert scale data sets, descriptive statistics such as mean averages, standard deviation, skewness, and chi-square tests were calculated to identify specific characteristics of the study sample in relation to the research questions. Due to the weakness of the convenience sampling technique used in selecting respondents (Etikan et al., 2015), inferential statistic measurements were not employed to draw generalizable conclusions and predictions about the population. More so, inferential statistics measures were not applied in this study as the research did not test any pre-determined hypotheses.

An inductive thematic analysis (Corbin & Strauss, 2008) was employed to analyze open-ended survey responses. The method allowed for the coding of responses according to dominant themes that emerged within each response. The process involved an initial reading of written answers to familiarize myself with the data and identify possible patterns. Similar patterns or ideas were then listed under each survey question as initial codes. Codes were later collated into themes, and these themes formed overarching categories under which emerging new codes were refined and regrouped. Refined categories and codes were finally discussed and substantiated with quotations from transcripts.

Results from the survey are presented in descriptive graphs and tables in the following chapter. Due to the lack of established theory on the subject matter and inherent weaknesses of the sampling method, the study's results make no claim to generalizations other than what is based on the researcher’s observations and reflections on responses. Therefore, the comments and discussions that follow are included to stimulate further investigation and empirical testing.

CHAPTER 4 – RESULTS

This chapter presents the results of data collected from respondents in line with the main idea of the research, which was to assess Covid-19's influence on people's tourism preferences in the aftermath of the pandemic. Findings discussed in this section speak to respondents' demographic data, results on their tourism preferences in the post-Covid era, factors that influence their choices, respondent's perceptions about PIRTs usage in the post-pandemic era, and their perspectives about future potentials of PIRTs in Niagara's Geopark tourism.

4.1 Demographic Data

Table 4.1 represents the demographic data of one hundred and seventeen (117) respondents who provided valid answers to the online questionnaire. Responses showed that females constituted about fifty-eight percent (58.1%) of respondents, and males made up over thirty-eight percent (38.5%). Over three percent (3%) of respondents identified as gender neutral, non-binary, or would rather not say.

The table also shows that the majority of respondents (35.9%) were between the ages of twenty–two (22) and twenty-five (25) years old. This was followed by 29.9 % of respondents who fall between ages eighteen (18) and twenty-one (21) years old, 20.5% between twenty-six (26) and thirty (30) years old, and 13.7% being over thirty years old. Majority of respondents (50.5%) were Undergraduate level students, followed by 32.6% Master's students, 8.5% pursuing College degrees, and 6.8% at the Ph.D. level. More than sixty percent (66.7%) of the respondents were either Canadian citizens or had permanent resident status and lived in the Niagara region. About 8.55% of respondents also indicated having a disability.

Table 4.1

Demographic profile of respondents, sourced from questionnaire data

Variable	Levels	Count	Percentage (%)
What is your gender	Female	68	58.1
	Male	45	38.5
	GNC/Non-binary	3	2.6
	Rather not say	1	0.9
Age range	15-17	0	0.0
	18-21	35	29.9
	22-25	42	35.9
	26-30	24	20.5
	30+	16	13.7
Current educational level	College degree	10	8.5
	Graduate Certificate	1	.80
	Graduate Master	38	32.6
	Graduate (Ph.D.)	8	6.8
	Undergrad	59	50.5
	Other	1	.80
Which of the options below best describes your status?	Study permit/International student	22	18.8
	Aboriginal/Indigenous people	17	14.5
	Citizen/Permanent Resident	78	66.7
Do you have a disability?	Yes	10	8.5
	No	107	91.5
Which region are you living in?	Niagara	78	66.7
	Outside Niagara but within Ontario	29	24.8
	Other	9	7.7
	Outside Canada	1	0.9

4.2 Analysis Of Respondents' Tourism Preferences in the Post-Covid Era

The following data addresses research question one, which aims to discover what tourism experiences tourists seek in the post-pandemic era. Table 4.2 offers insight into some travel behaviors of respondents during the Covid-19 outbreak by showing that a majority of respondents (73%) did not travel during the pandemic.

Table 4.2

Travel patterns of respondents during the pandemic, sourced from questionnaire data

Variable	Categories	Count	Percentage (%)
Did you travel during the pandemic?	Yes	44	26.6
	No	73	73.4
	Total	**117**	**100**

Most respondents (42.7%) indicated travel to in-country destinations for their most recent vacation trips. Many (34.2%), however, had their most recent vacations in international destinations, while a few undertook leisure trips in their home regions (16.2%) or virtually (6.8%), as shown in Table 4.3.

Table 4.3

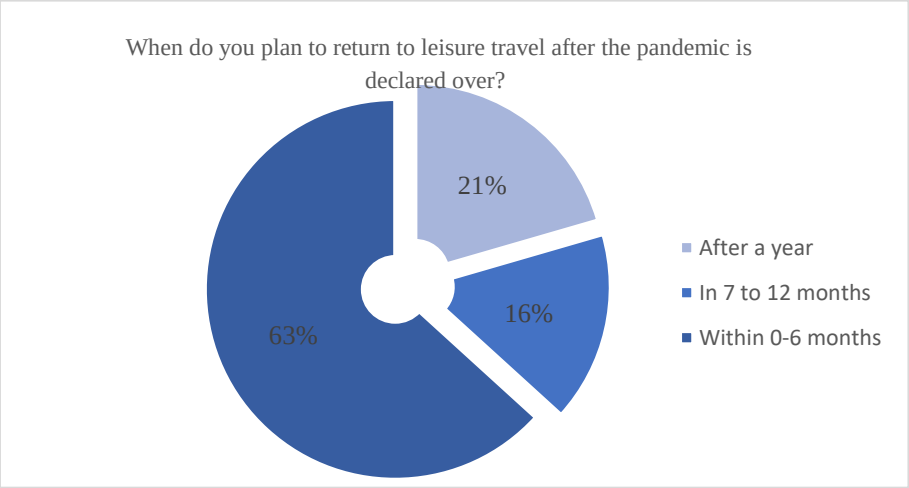
Travel destinations during the pandemic, sourced from questionnaire data

Variable	Categories	Count	Percentage (%)
Where was the destination of your most recent vacation or leisure trip?	In my country	50	42.7
	In my region	19	16.2
	International	40	34.2
	Virtual	8	6.8
	Total	**117**	**100.0**

In determining how soon Millennials were likely to take a tour after the pandemic is declared over, majority of respondents (63%) indicated a desire to travel within the first six months, as illustrated in Figure 4.1. The following 21% preferred to travel in about 7 to 12 months, while 16% preferred to travel a year after the pandemic is declared over.

Figure 4.1

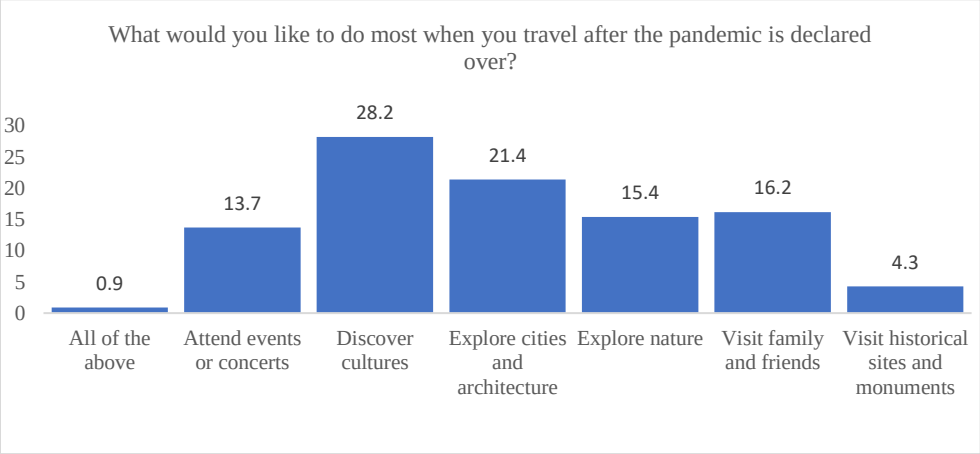
How soon Millennials are likely to take a tour after the pandemic is declared over, sourced from questionnaire data.



When asked what activities they would like to indulge in during post-Covid travel times, most respondents indicated preferences for discovering new cultures, exploring cities and architecture, and visiting family and friends as top priority tourism activities. Exploring nature, attending events, and seeing historical sites or monuments came next in their order of preferences. These findings are summarized in Figure 4.2 below.

Figure 4.2

Preferred tourism activities in the post-Covid era, sourced from questionnaire data



4.3 Factors that Influence Respondents' Future Travel Decisions

Table 4.4 presents factors that influence respondents' decisions regarding their tourism choices. Questions were rated on a five-point Likert scale ranging from Strongly Agree (1) to Strongly Disagree (5). The data showed that most respondents strongly agree or agree that their budget is a primary factor when planning a trip, although they do not mind spending a bit more to treat themselves while on a trip. Most respondents would also welcome the opportunity to engage with locals, partake in local culture, and interact with other travelers during the tour. Some respondents were willing to opt for entirely private tours if it meant protection from risks of exposure to diseases and infections. A majority of them, however, were indifferent about this position.

In making destination choices, the majority of respondents disagreed that the image and popularity of destinations were more important than cost. And, they did not mind choosing a less popular destination even if there would be few tourist crowds. In addition to these factors, most respondents who agreed that a virtual tour is a likely option in the near future marginally exceeded those who strongly disagreed.

Table 4.4

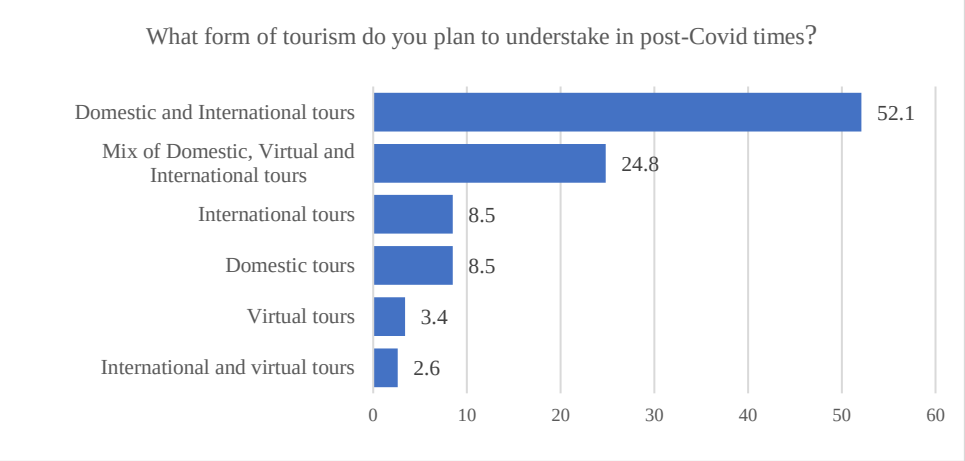
Factors influencing respondent's future tourism preferences

Based on your experience of Covid 19, how would you consider the options below when making a tour decision?	Strongly Agree (% score)	Agree (% score)	Neither agree nor disagree (% score)	Disagree (% score)	Strongly disagree (% score)
Budget is a primary factor when I'm planning a trip	56.4	29.9	6.0	6.0	1.7
I go on holiday to treat myself, so I don´t mind spending a bit more.	14.5	44.4	27.4	11.1	2.6
I'd welcome the opportunity to engage with locals and partake in local culture	52.1	38.5	6.0	3.4	0
I'd like to meet and interact with other travelers	34.2	38.5	17.9	7.7	1.7
The destination's image, popularity and prestige are more important than the cost.	6.8	14.5	28.2	35.9	14.5
I prefer private tours to avoid risks of exposure to diseases and infections	6.8	29.9	39.3	12.8	11.1
I'd choose a less popular destination if there were few tourist crowds.	27.4	39.3	22.2	8.5	2.6
I will choose a destination close to my home region	9.4	39.3	23.9	17.9	9.4
A virtual tour is a likely option for me in future	9.4	27.4	19.7	17.1	26.5

Overall, most respondents intend to undertake domestic and international tours in post-Covid times. At the same time, a few more are open to combining a mix of domestic, international, and virtual forms, as illustrated in Figure 4.3. Taking solely virtual tours or combining VTs with international tours ranked least in respondents' preferences for the listed tourism forms in post-Covid times.

Figure 4.3

Forms of tourism Millennials are most likely to undertake in the post-Covid era, sourced from questionnaire data



4.4 Respondents' Perceptions about PIRTs

The data in Table 4.5 indicates that most respondents did not think a virtual PIRT tour would be as good as in-person travel to the destination. However, they agreed that a PIRT tour is an ecologically friendly form of tourism and an excellent opportunity to explore the local destination before arriving. Some respondents also considered the model a safe form of tourism in the aftermath of Covid, although most respondents expressed neutrality about this position. Respondents also strongly preferred to engage in real-time interactions with tour guides during the virtual tour process.

Table 4.5

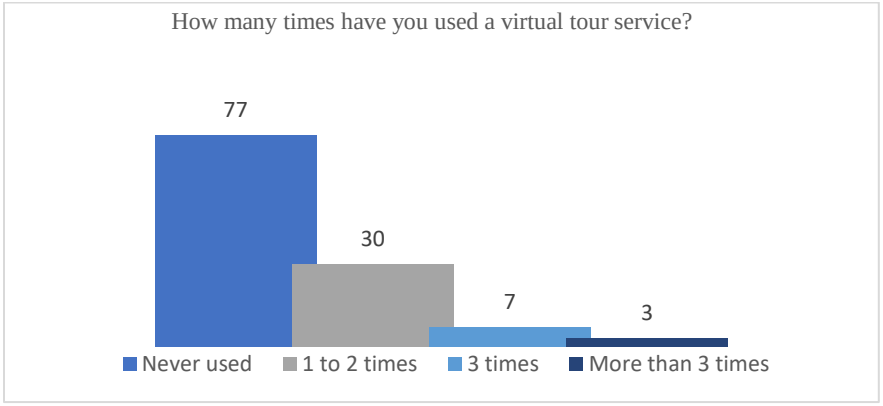
Respondent's impressions about PIRTs, sourced from questionnaire data

What are your impressions about PIRT tours?	Strongly Agree (% score)	Agree (% score)	Neither agree nor disagree (% score)	Disagree (% score)	Strongly disagree (% score)
I think a virtual PIRT tour will be as good as in-person travel at the destination	12.0	13.7	16.2	37.6	22.2
A PIRT tour is a good opportunity to explore the local destination before I arrive	39.3	47.0	10.3	0	3.4
A PIRT tour is an ecologically friendly form of tourism	23.9	53.0	20.5	2.6	0
PIRT tours will be the safest form of tourism in the aftermath of Covid	20.5	31.6	40.2	6.8	.9
I think virtual PIRT tours are less costly compared to traditional long-haul travels	35.9	48.7	14.5	.9	0
I see mostly benefits from using technological products in general	18.8	38.5	25.6	10.3	6.8
I'd like to interact with a tour guide in real-time during the virtual tour process	29.9	42.7	16.2	6.8	4.3

While respondents agreed to seeing mostly benefits from using technological products in general, most of them had never used a virtual tour service before, as seen in Figure 4.4. They were neutral about taking PIRT tours because they were intrigued by technology.

Figure 4.4

Showing number of times respondents have used a VT Service



That notwithstanding, most respondents agreed to take PIRT tours because that form of tourism is conveniently accessible on a mobile device. Although a near majority of respondents would choose the model because it saves time, they generally preferred to be in destinations at all costs. Whereas most respondents strongly agreed that PIRT tours were less costly compared to traditional long-haul travels, they were unwilling to choose the model for the sole purpose of cutting down on budget. This characteristic is consistent with respondents' willingness to spend a little more to treat themselves on their trip, as shown in Table 4.4. Most respondents agreed that PIRT was a good way to reach places where in-person travel was impossible due to health concerns. They also agreed to choose the model instead of in-person travel if it helped to reduce overtourism or meant environmental conservation for destinations. Respondents' perceptions about PIRTs are represented in Table 4.6.

Table 4.6

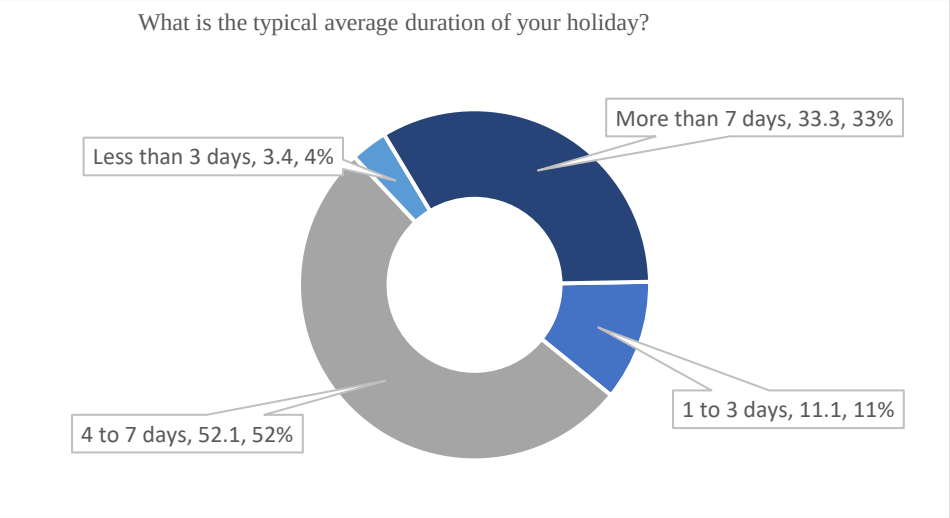
Respondents' perceptions about PIRT in post-Covid time. Sourced from questionnaire data.

How would you consider PIRT tours in the following contexts in post-Covid times?	Strongly Agree (% score)	Agree (% score)	Neither agree nor disagree (% score)	Disagree (% score)	Strongly disagree (% score)
I will take PIRT tours because I am intrigued by technology	12.0	17.1	42.7	14.5	13.7
I will choose a PIRT tour because that form of tourism saves time	7.7	26.5	29.1	16.2	20.5
I will always choose a PIRT tour if it enables me to cut down on budget	17.9	17.9	17.1	23.9	23.1
I will take a PIRT tour instead of in-person travel if it helps to reduce overtourism in destinations	13.7	38.5	14.5	17.9	15.4
I will take virtual PIRT tours to places where in-person travel is not possible due to health concerns	39.3	33.3	18.8	1.7	6.8
I will take a PIRT tour because it is conveniently accessible on a mobile/ computer device	8.5	46.2	22.2	8.5	14.5
I will take PIRT tours if it means environmental conservation for a destination	2..4	50.4	14.5	4.3	9.4
I prefer to be at the destination at all costs	18.8	34.2	30.8	12.0	4.3

Regarding holiday durations, respondents preferred to spend about four to seven days during an average holiday, as indicated in Figure 4.5 below.

Figure 4.5

Showing the average duration of holidays



But they were mainly willing to spend one to three hours or less on virtual tours, as presented in Figure 4.6 (Mean statistics score of 1.54; standard deviation of .876).

Figure 4.6

Showing the amount of time respondents are willing to spend on VTs

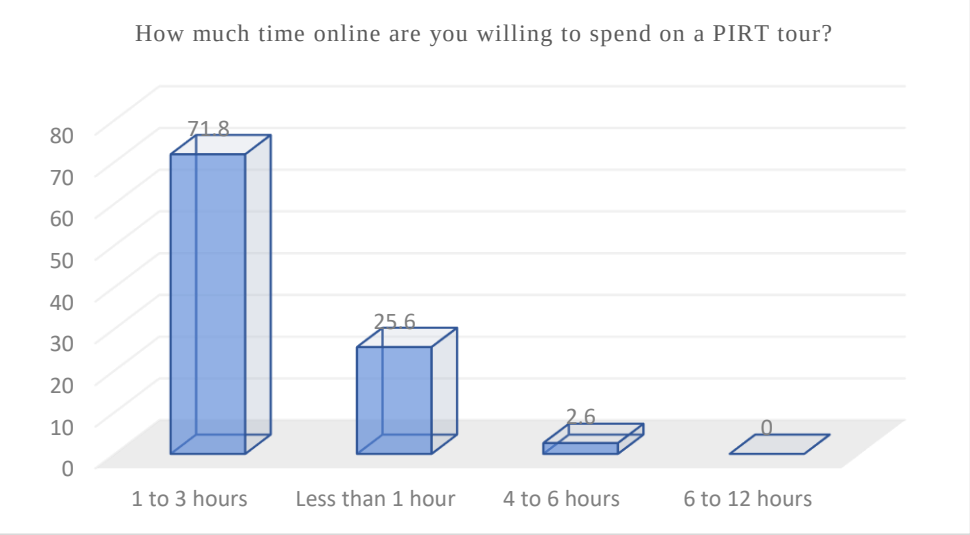
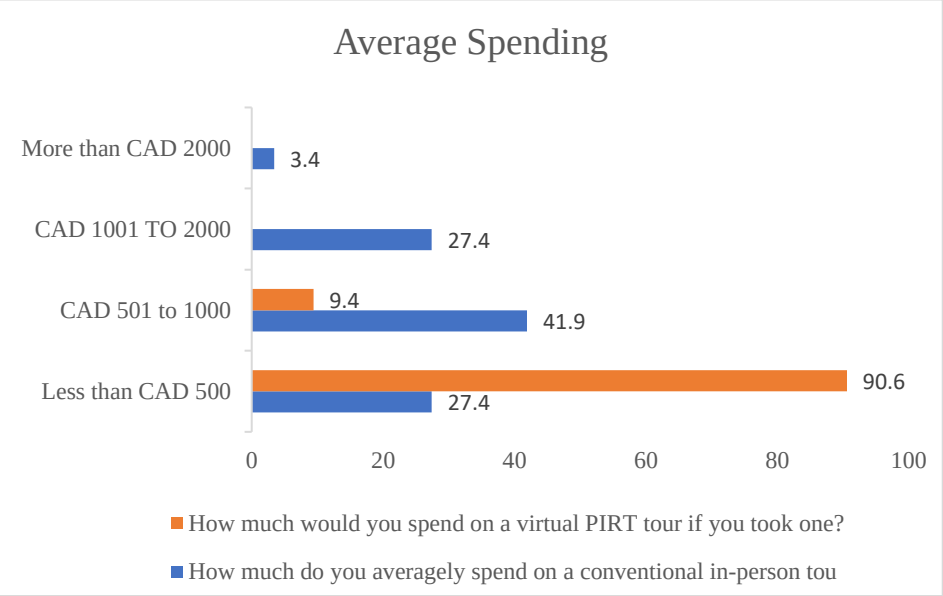


Figure 4.7 reveals that most respondents were willing to pay less than CAD 500 for virtual PIRT tours (Mean statistic score of 1.92, standard deviation score of 0.293). However, they were willing to spend about CAD 501 – CAD 1000 on conventional in-person tours.

Figure 4.7

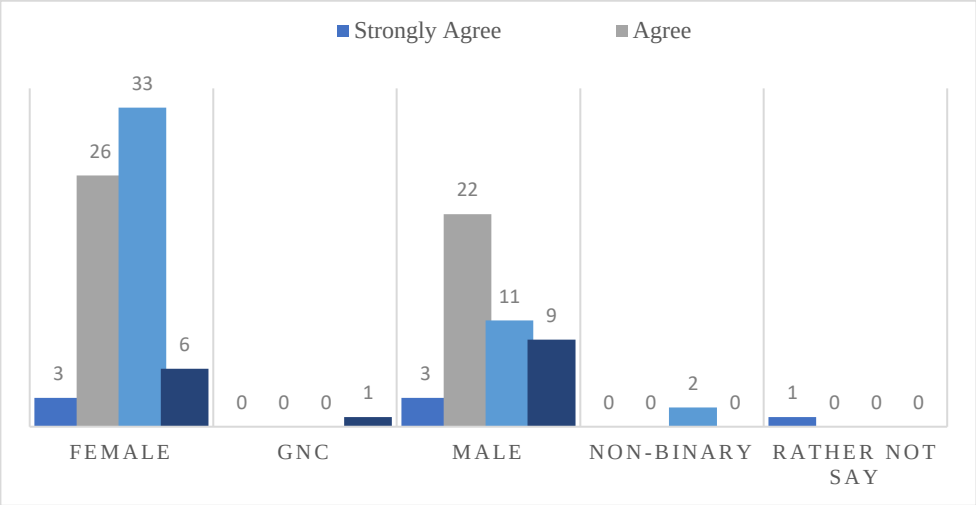
Respondents' average spending on VTs and conventional tours



A cross-tabulation of respondents' genders against their degrees of agreement on general impressions about PIRTs, as presented in Figure 4.8, revealed that respondents who identified as female showed the highest levels of agreement. Respondents who identified as males came next. Females also expressed the highest levels of neutrality to responses compared to males and non-binary respondents. Males expressed the highest amount of disagreement regarding their impressions about PIRTs, followed by females and gender-neutral respondents. The table represented the various gender categories as follows: Females (1), Gender Neutral categories (2), Males (3), Non-binary (4), Rather not say (5).

Figure 4.8

Cross tabulation of respondents' impressions about PIRTs by gender



Although the study did not test hypotheses, the chi-squared analysis of respondents' impressions about PIRTs by gender was conducted to give a general idea of how respondents in the gender categories perceived PIRTs based on the various levels of agreement. Chi-squared results presented in Table 4.6.1 show an Asymptotic Significance of .001, which is less than the designated alpha of .05. This value suggests the likelihood of a significant association between the gender of respondents and the degrees to which they agree or disagree on their impressions about PIRTs. If this were a hypothesis being tested, the results would lead to the rejection of any null hypothesis that asserts that gender and respondents' levels of agreement were independent of each other.

Table 4.6.1

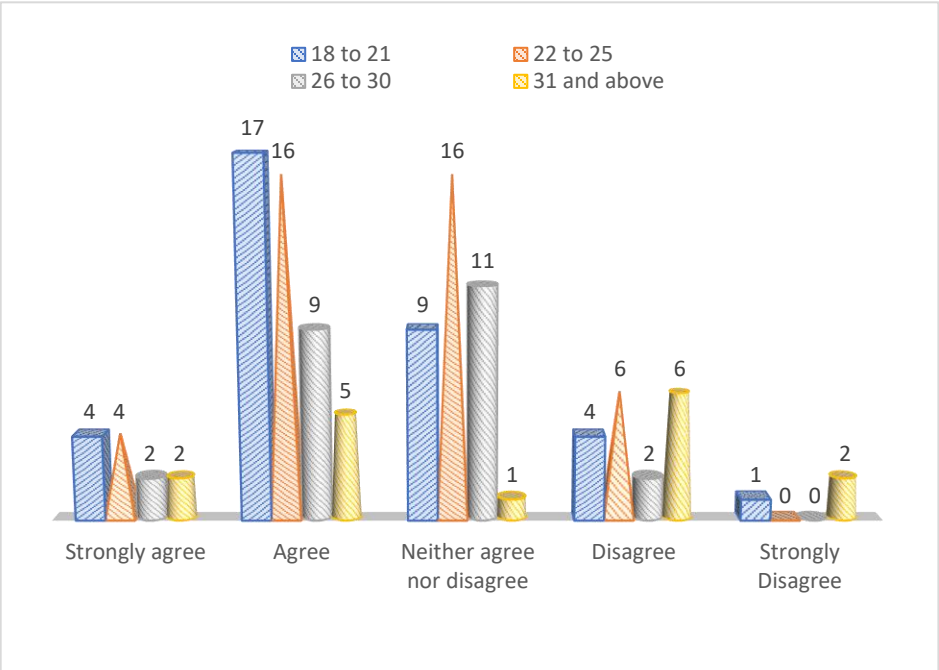
Chi-square test on respondents' impressions about PIRTs by gender

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.723[a]	12	.001
Likelihood Ratio	21.245	12	.047
Linear-by-Linear Association	.344	1	.558
N of Valid Cases	117		

Figure 4.9 also summarizes cross-tabulation results of respondents' degrees of considering PIRTs according to age distribution. The results show that younger (Millennial) respondents between the ages of 18 and 21 years show the highest level of agreement for considering PIRT tours under various circumstances. This is followed by respondents within the 22-to-25 age cohort. Respondents aged 26-to-30 show a fair level of agreement, while those aged 30 years and above show the least levels of agreement for considering PIRTs under the contexts in which they were presented in the survey (Table 4.6). Further, respondents between ages of 22 to 25 years show the highest level of neutrality. This is followed by 26-to-30 year olds, 18-to-21 year olds, and above 31-year-olds, respectively. Respondents above 31 years and those between 22 to 25 years expressed the highest levels of disagreement. The table represented the agreement levels as follows: Strongly agree (1), Agree (2), Neither agree nor Disagree (3), Disagree (4), Strongly Disagree (5).

Figure 4.9

Cross tabulation of respondents' considerations for PIRTs by age



Like Table 4.6.1, Chi-squared results tabulated in Table 4.6.2 indicates some amount of significant relationship between the ages of respondents and their degrees of considering PIRT tours under the contexts outlined in Table 4.6. This means that how young or old respondents are, is likely to have a bearing on the degrees to which they agree or not to take PIRT tours in the contexts outlined.

Table 4.6.2

Chi-square test on respondents' considerations for PIRTs by age range

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.101[a]	12	.049
Likelihood Ratio	19.923	12	.069
Linear-by-Linear Association	3.116	1	.078
N of Valid Cases	117		

4.5 Smart Tourism Potentials in Niagara's Geoparks

The data in Table 4.7 indicates that respondents had actively visited attractions in the Niagara region, with above 30% percent visiting the area two times in the past 15 months and above 26% percent visiting more than three times. This is followed by 18% of them visiting once, 14.5% visiting three times, and 9.4% not visiting attractions in Niagara in the past 15 months.

Table 4.7

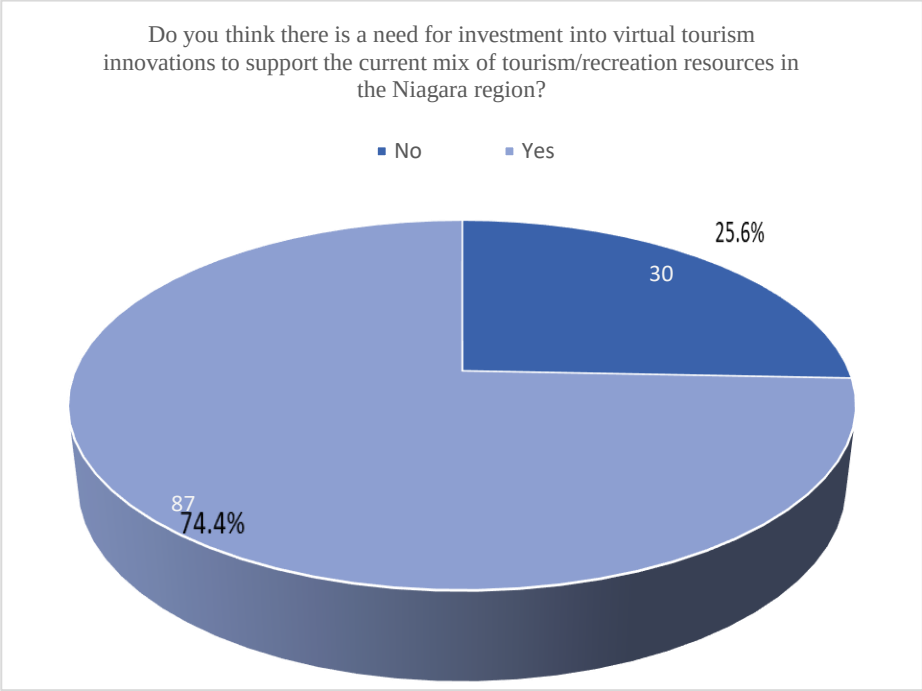
Respondents' visits to attractions in Niagara, sourced from questionnaire data

Variable	Categories	Percentage (%)	Count
How many times have you traveled to attractions in the past 15 months?	Two times	30.8	36
	More than three times	26.5	31
	Once	18.8	22
	Three times	14.5	17
	Never	9.4	11

Figure 4.10 highlights that although respondents disagreed that they would derive the same experience of in-person tours from PIRTS, a majority of them (constituting 74.4%) were of the view that there is a need to invest in virtual tourism innovations to support the current mix of tourism resources in the Niagara region.

Figure 4.10

Respondents' opinions on VT investments in Niagara's geoparks.



The findings showed that respondents perceived significant benefits of VTs to the overall development of tourism in Niagara. They ranked higher the benefits of managing environmental impacts on destinations and economic growth. Destination access, destination marketing, promoting and preserving Indigenous cultural expressions, and establishing a balance between protecting and promoting indigenous cultures such that

cultural authenticity is preserved came next, respectively. This information is presented in Table 4.8 below.

Table 4.8

Ranking the benefits of incorporating virtual tourism in Niagara's geopark destinations, sourced from questionnaire data

Ranking the benefits of incorporating virtual tourism in Niagara's geopark destinations	1 – Min. score (%)	2 (%)	3 (%)	4 (%)	5 – Max. score (%)	Mean	Std. Dev	Variance
Managing environmental impacts at destinations (such as reducing CO2 emissions, preserving nature and wildlife, minimizing tourist waste production and energy consumption	3.4	6	17.9	23.1	49.6	4.094	1.1063	1.224
Economic growth (improving access to new job opportunities, e.g., remote tour guides)	2.6	10.3	21.4	35	30.8	3.812	1.0662	1.137
Destination marketing	2.6	11.1	28.2	28.2	29.9	3.718	1.0895	1.187
Access to destinations	2.6	12	23.1	36.8	25.6	3.709	1.0591	1.122
Promoting intercultural relations between local people and tourists	3.4	10.3	27.4	31.6	27.4	3.692	1.0864	1.18
Promoting Indigenous cultural expression	2.6	9.4	36.8	26.5	24.8	3.615	1.0409	1.084
Cultural survival (respect for the preservation of Indigenous culture through sustainable cultural tourism	7.7	12	28.2	27.4	24.8	3.496	1.2079	1.459
Added opportunity for involving indigenous people in tourism development	11.1	10.3	29.1	38.5	11.1	3.282	1.1435	1.308
A good way to establish balance between the protection and promotion of Indigenous cultures, such that cultural authenticity is preserved	8.5	17.9	33.3	28.2	12	3.171	1.1241	1.264

CHAPTER 5 – DISCUSSION

5.1 Chapter Introduction

The unexpected disruptions brought on by Covid-19 pandemic resulted in unprecedented changes to travel patterns and activity at the global level (Gössling et al., 2020). Bhaduri et al. (2020) discussed that people's natural responses to its spread and impact have been phenomenal. Understanding some of such behavioral changes, especially as it relates to transportation and travel, is thus crucial for effective planning of interventions. Given that physical human interactions trigger viral transmissions (Hao et al., 2022), and inherent risks to exposures increase with age (Zwanka & Buff, 2021), researchers identify that age or generational segmentations significantly moderate tourists' preferences and intentions to travel, especially in times of crises (Pennington-Gray et al. (2003). Their assertion is in line with findings presented in Table 4.6.1 and validates the need for further discussions into generational cohorts.

This exploratory study on future tourism preferences of Millennial students in the context of their experience with Covid-19 rests on the premise that different generations, including Millenials, have different lifestyles, demands, preferences, and would be attracted to different kinds of activities at specific times (Corbisiero & Ruspini, 2018; Jamal & Newbold, 2020; Kim & Park, 2020). Moreover, Millennial youth travel is becoming a fast-growing segment of the international tourism market, accounting for more than 23% of worldwide travels each year (Ketter, 2020). The Millennial generational cohort, therefore, presents tremendous socioeconomic prospects for local communities as they foster closer social engagement with host people and champion local economic development through their travel indulgences (Cavagnaro et al., 2018). Insights into their potential short and long-term responses to travel in the aftermath of the pandemic would offer some understanding of travel-related impacts of such pandemics on Millennials (Bhaduri et al., 2020).

5.1 Covid -19 and Millennial Generation Travel Patterns

Mathur, Moschis, and Lee (2003) acknowledged that stressful life events lead to initiation, intensification, or changes in people's consumption habits. Several examples of how past catastrophic events have profoundly impacted people's viewpoints, behaviors, and consumption patterns have been studied by many researchers (Zenker & Kock, 2020). In the context of the current Covid pandemic, there is a quickly growing body of studies that continue to explore significant impacts of the outbreak on tourists thinking, behaviors, and consumption patterns (Chebli, Othmani & Said, 2020; Dube, 2021; Zenker & Kock, 2020).

Fron the findings of this study, the impacts of the current Covid crisis on tourism behavior have been identified in respondents' intentions to predominantly resume international or domestic travels and, perhaps, make room for virtual tours in the early days of recovery. Although they indicated little preference for taking solely international or domestic tours, respondents showed a strong likelihood of combining both forms in their future tourism undertakings. Contrary to studies that predicted international travel may be entirely out of the picture for tourists who opt for domestic vacations (Dube, 2021), findings from Millennial respondents in this study largely suggest a unification of both forms of travel in post-pandemic times.

Additionally, the findings revealed that virtual tours alone were among the least preferred forms of tourism that respondents were willing to engage in the future. Instead, they would combine virtual tours with both domestic and international tours. Why respondents showed strong preferences for combining a mix of the various tourism forms (domestic, international, and virtual) as compared so solely aligning with either domestic, international, or virtual tours could be attributed to the work of Chebli and Said (2020). They postulated that the diversity of what was accessible for one's quality of life before and during lockdown conditions may define new-normal realities, leading to attitudinal changes in both tourists and the destinations where tourism occurs.

Despite global lockdowns and travel restrictions accompanying the Covid-19 crisis, people's desires to travel to domestic and international destinations persist (Chan et al., 2021). This discovery is in line with research on post-Covid travel patterns from

destinations such as Pakistan (Abdallah et al., 2021), China (Zhang et al., 2022), India (Gajendran, 2020) and Australia (Beck & Hensher, 2020). The claim holds for Millennial respondents in this study, regardless of the burdens of isolation, testing, and mobility restrictions they experienced during the pandemic. Sacrificing in-person travel altogether for more virtual experiences does not seem to be the preferred choice for respondents in this study. In fact, they would "prefer to be at the destination at all costs" (Table 4.6). They may consider taking virtual tours, although not entirely, due to accessibility, safety, or ecological concerns.

Taking international and virtual tours, in exclusion of domestic tours were the least preferred choice. In resonance with Lew et al. (2020), post-crises Millennial tourists in this study were willing to choose destinations closer to their home regions (Table 4.4), as well as engage in international travel. Accounting for this choice could be factors such as fear of risks and insecurities arising from people's experience of Covid, as identified by Prideaux, Laws and Faulkner (2007) in their study of previous crises. Other attributable factors would be declines in people's disposable incomes and purchasing power due to economic challenges presented by the pandemic (Bundervoet et al., 2022; Kugler et al., 2021; Nicola et al., 2020); and anticipated challenges of undertaking only long-haul travels. Given that respondents perceived virtual tours not to be as good as in-person tours (Table 4.5) also explains why they may be unwilling to risk aligning solely with that form of tourism, when they may be able to take advantage of options to have more experiential encounters in "safer spaces" (Özdemir & Yildiz, 2020; p1111) such as through domestic tourism.

Respondents' preferences for the various travel forms identified in the survey speak to their knack for experience and novelty derived from being present in destinations (Fennell, 2020; Hajibaba et al., 2015; Iso-Ahola, 1982). They show attitudes of the crises-resistant traveler who is open to exploring and adapting to alternatives that enable them meet their tourism needs under certain circumstances rather than limiting themselves to one particular approach (Prideaux, Laws, & Faulkner, 2007).

5.2 Post-Pandemic Tourism Forms

Findings from this study also show that Millennial tourism potentials to the industry in the post-Covid stage are unlikely to decline, as many indicate a desire to return to travel in as early as six months after the pandemic is declared over (Figure 4.1), even though most respondents did not travel during the pandemic. Domestic and international travels to unexplored destinations to discover and engage with cultures other than one's own ethnic group or that which one is familiar with was the most preferred post-pandemic tourism activity by respondents in the study (Figure 4.2; 4.3). This preference can open up opportunities for promoting rural tourism centered uniquely on natural, Indigenous, or local attractions (Rogerson & Rogerson, 2021b). Respondent's preferences for vacations to last mostly between four (4) to seven (7) days is consistent with the literature which predicted vacation options such as staycations, micro holidays, and short-haul travels to become popular choices among post-pandemic tourists (Moon & Chan, 2022). Wachyuni and Kusumaningrum (2020; p74) reported similar findings by stating that "tourists will prefer natural attractions with short travel times."

Exploring cities and visiting family and friends come second and third in the order of preference for respondents, respectively (Figure 4.2). The latter selection emerges from the need to restore social disconnections brought about by COVID-19 restrictions (Peters et al., 2020). Visiting friends and relatives (VFR) travel is viewed by Backer and Ritchie (2017) as an early tourism recovery strategy for destinations in post-disaster phases. This form of travel enhances communication, experience sharing, and maintaining already established relationships with distant family and friends (Hall et al., 2020; Moon & Chan, 2022).

Nature tourism (exploring nature) comes after VFR tourism (Figure 4.2). This preference coming forth place for respondents in this study indicates a likelihood for domestic and international ecotourism tourism forms to remain reasonably stable in post-pandemic times. Respondents' engagements in nature tourism activities such as hiking, walking trails, kayaking, backpacking, mountain tourism, camping and adventure tourism are likely to be consistent as people desire to experience the outdoor and unwind from Covid-related limitations on movement (Rogerson & Rogerson, 2021b; Seraphin &

Dosquet, 2020). The preference for nature and outdoor leisure is arguably inspired by people's desire for escapism from the prolonged restrictions they faced during the pandemic. This characteristic is potentiated by the respondent's strong choice to be in destinations "at all costs" (Table 4.5). The finding supports the OECD's prediction that "nature will be explored more in the post-COVID-19 era" and that natural spaces which offer remoteness, water freshness, and air purity will become more valuable to tourists and lead to a significant rise in domestic tourist flows to protected areas (OECD, 2020b). Accordingly, Wachyuni and Kusumaningrum (2020: 74) posited that "nature tourism will be an important form of attraction, with important aspects of safety, cleanliness, and beauty to fulfill tourist demands." Indoor activities such as attendance to concerts, events, and visits to historical sites were less favored options in the order of preference for respondents.

Due to the magnitude and length of restraining measures experienced during the pandemic, some studies anticipated the pandemic's footprint to last until at least 2023 (Gaun et al., 2020). The WTTC predicted that it would take over a year for the travel and tourism industry to regain previous levels of participation, in the best-case scenario that it does. The characteristic of early pre-identified demand among respondents thus offers promising prospects to tourism firms in terms of their marketing outlook, strategies, and revenue projections (Boes, Buhalis & Inversini, 2014; Liberato, Alen & Liberato, 2018; Gallo et al., 2021). For destinations that offer related services and product niches, especially in the cultural, nature, and urban tourism sectors, the anticipated early return of tourists to such forms of tourism may imply effective planning for business resumption on the basis of safety, security and re-instated trust (Brouder et al., 2020; Sigala, 2020). This insight also offers destinations the chance to redesign their marketing projects to include pull factors that appeal to this market segment (Ketter, 2019; Chebli, Othmani & Said, 2020).

5.3 Potential Drivers of Millennial Tourism Decisions in the Post-Covid Era

Sheth (2020) highlights disasters such as earthquakes, global disease outbreaks, and pandemics as the fourth, less predictable cause of change in people's consumption habits.

Such crises present several constraints to people's lifestyles and ways of living. But constraints can yield improvisations or creativity, according to Chan et al. (2021), and create avenues for consumers to either discard old habits or invent new ones to fill lifestyle gaps that may arise (Sheth, 2020). Examples of such improvisations include the many zoom funerals, online graduation sessions, and virtual classrooms that replaced their respective traditional forms during the pandemic. For service sectors such as tourism, improvisations can induce modifications of old practices or the adoption of new innovative alternatives to otherwise conventional patterns of tourism production and consumption (Hall, Scott & Gössling, 2020).

In the context of the ongoing pandemic, understanding and meeting the diverse post-pandemic demands of tourist markets would require knowledge and insight into the drivers of their tourism decisions and preferences (Buhalis, Costa & Brandão, 2022; Song et al., 2019). Such an understanding will eventually enable stakeholders to tailor products, services, and activities that work for the collective good of both consumers and society (Zenker & Kock, 2020). From the survey findings, three key factors stood out in the examinations of potential influencers for Millennial tourism preferences (Table 4.4). They include the cost implications of the trip, a desire for engagement, and considerations for ecological good.

5.3.1 The Cost factor

The cost factor as an influencer of Millennial respondents' future travel patterns is indicated in their strong considerations for budget against other factors such as destination image and popularity (Table 4.4). Also, respondents generally agreed that alternative tourism forms such as PIRTs would be less costly than traditional long-haul travels (Table 4.5), and they are willing to spend less than CAD 500 on a PIRT tour package (Figure 4.7). Whereas some previous studies found that young people spent as much as US$2,600 on average trips, the scenario seems to have changed under the current Covid crisis, with Millennial respondents preferring to spend between CAD500 to CAD1000 on traditional long-haul tours. The cost concern can be linked to the impacts of economic downtowns experienced

by respondents during the pandemic (Bundervoet et al., 2022; Kugler et al., 2021; Nicola et al., 2020; World Development report, 2022). Financial implications of lockdowns imposed on societies to limit viral transmission during the pandemic have been immense, transcending the operations of major business corporations and individual livelihoods. With countries forced to reorient their focus on infection prevention and safety through restrictive measures during the outbreak, many businesses in diverse sectors were thrust into financial risks. The World Bank described the situation as shock waves that triggered the largest global economic crisis in more than a century (World Development Report, 2022).

Families and individuals were overwhelmed with all manner of pandemic-induced financial constraints and inequalities from the income and labor losses that followed. Businesses and households already burdened with unsustainable debts before the crisis were served with worsened economic fragilities as income, credit levels and business revenues declined (Reinhart, 2022). Global poverty and inequality levels reached record highs, especially among the youth, women, casual workers who had lower levels of formal education, and students who relied on limited sources of income or were burdened by loans (Kugler et al., 2021; World Development report, 2022).

To Millennials, the Covid-related economic downturns anchored worrying concerns about present and future wellbeing and sustenance. According to Schaeffer and Rainie (2020), Millennials are more anxious about how the pandemic will threaten their future economic realities than older generations. Recalling the impacts of the 2008 economic recession on the long-term career expectations of Millennials (DeVos & De Hauw, 2010), Schaeffer and Rainie (2020) argued that the Millennial generational cohort is likely to remain pessimistic about the economic impacts of the pandemic for decades to come. As a generation evolving through a second recession (DeVos & De Hauw, 2010), the pandemic and its impacts are anticipated to be another generation-defining anxiety for Millennials as they confront future needs of career, parenting, home ownership, cost of food, medical expenses, or education.

Adding to Millennials' economic anxieties are the vulnerabilities of being the most affected generation in terms of recent labor and pay cuts (Bundervoet et al., 2022). This is because many Millennials are of school-going age and, therefore, less prepared to

withstand the Covid-related financial shocks that came to bare during the pandemic (World Development Report, 2022). Older Millennials in early careers are also noted to be employed predominantly in casual positions in the recreation, hospitality, and entertainment industries. However, these industries were the hardest hit by the pandemic. With recovery from the present crisis envisaged to be delayed and uneven, particularly for economically disadvantaged groups (Klien & Smith, 2021; World Development report, 2022), it is not surprising to find the Millenial generational cohort rethinking their vulnerabilities and the economic implications of their spending when making purchasing decisions.

However, despite the economic anxieties faced, this study's findings present a curious paradox where respondents are both concerned about the budget but at the same time do not mind spending a little more to "treat" themselves on the trip (Table 4.4). This agrees with the work of Silverstein and Fiske (2003), who found that Millennials are ever willing to trade up and pay for luxurious travel experiences. Echoed by respondents' reluctance to choose virtual tours on the sole basis of cutting down costs (Table 4.6), this paradox suggests the presence of equally essential, but possibly stronger determinants on which the Millennial's future tourism decisions will be based.

5.3.2 A desire for engagement

According to Cavagnaro et al. (2018), the average Millennial prefers spending money on travel experiences and exploration to personal possessions. In planning so, Wang et al. (2018) explained that Millennials are likely to choose destinations and tour activities based on peer recommendations shared online on social media platforms, travel blogs, and review websites. Besides initial destination choices, actual tours are likely to be executed individually and independently, with a tailored search for novelty. The latter results in Millennials' preferences for less popular destinations in a bid to be authentic (Kim et al., 2021).

From the findings of this study, the need to experience novelty through engagement, as identified by Cavagnaro et al. (2018) and Kim et al. (2019), stands out as

a vital driver of tourism decisions for respondents. They indicated this need by ranking opportunities to engage with local populations, local cultures, and with other tourists as high-level considerations when making tour decisions (Table 4.4). Like the crisis-resistant traveler who derives novelty and significance from being present in destinations, respondents portrayed a willingness to pursue engaging experiences instead of taking PIRT tours, even though they regarded the latter as a safe form of tourism in post-covid times (Table 4.5). They primarily expressed uncertainty (neither agree nor disagree) about preferring private tours to avoid risks of exposure to diseases and infections (Table 4.4). In addition, respondents emphasized their desire for experience by establishing a willingness to spend a few more dollars to treat themselves on the trip.

Millennials derive fulfillment from engaging in adventures and interactive tours because of their disposition to social interconnectedness (Suleman & Nelson, 2011); a characteristic identified by Wiese and Kruger (2016) to be acquired from their upbringing and educational experiences. From team projects to group sporting activities, connecting with friends on social media platforms, or collaborating in the workplace, Millennials are known to exhibit stronger social interconnectedness with their peers than other generations (Suleman & Nelson, 2011). This character translates into a growing need for meaningful experiences in aspects of life such as leisure and tourism (Kim et al., 2019). The quest for novelty and experience lead to a rejection of homogenized products and an affinity to new encounters, heightened experiences, new knowledge, emotions, and solutions among Millennials (Cavagnaro et al., 2018). In all stages of the tour cycle, Millennial travelers derive meaning through the network of social interactions they establish. Traveling becomes a lived experience of personal development centered around interpersonal exchanges, socialization, and entertainment. It is therefore understandable to find Millennial respondents in this study desiring to engage with other tourists (Table 4.4), with local communities as they discover new cultures (Figure 4.2), and with family and friends as seen in their interest for VFR travel in post-pandemic times (Figure 4.2). This character carries within it an advantage for destination developers and tourism service providers who follow through on innovative choices and approaches introduced by this generation to the broader society (Cavagnaro et al., 2018).

Nonetheless, respondents' decisions to return to travel sooner than later, indulge in more international and domestic trips instead of virtual tours, and satisfy their experiential curiosities is also an indication that the negative impacts of tourism experienced in pre-crisis times could also be in worse shape after the pandemic. Cohen (2020, p. 1) characterizes the COVID-19 pandemic as "simultaneously a public health emergency and a real-time experiment in downsizing the consumer economy." He was optimistic that the pandemic could catalyze social change towards more sustainable consumption as people acclimate to a "new normal." However, while lockdowns enlightened consumers about the possibilities of living without certain luxuries, some reports caution against a resurgence in consumption to higher levels than what was known before the pandemic (Zwanka & Buff, 2021). Zwanka and Buff (2021) particularly highlight an awakening of hedonic attitudes triggered by a "You Only Live Once" philosophy as a way for people to deal with previous stresses experienced during the pandemic. This philosophy is driven by both people's need to reclaim their mobility and the tourism sector's desperation to restart economies. This position thus raises questions about how people's contrasting needs for exploration, travel, and environmental awareness interact with questions of subjectivity (Crouch & Desforges, 2003).

5.3.3 Ecological Considerations

In addition to cost and experiential factors, another significant determinant of post-Covid tourism choices of respondents is the tendency to make tourism consumption decisions based on considerations for ecological good. Choosing a less popular destination over a region that suffers from overtourism (Table 4.6) can be an indication of the Millennial's altruistic orientation to environmental and sustainability values (Ketter, 2021; Kibert et al., 2012; McEwan & Goodman, 2010). The Millennial respondents in this study align with sustainability goals in the sense that they desire to remain environmentally conscious even in their search for novelty.

In the Covid context, Zwanka and Buff (2021) admonish that with increased personal health and safety awareness, the consciousness of the impacts of one's travel

behaviors on others will become a critical consideration when making travel decisions. Together with ongoing global advocacies for environmental reprieve, Crossley (2020) attributes such consciousness to ecological grief induced by events of the pandemic. “Ecological grief” is defined by Cunsolo and Ellis (2018) as “grief felt in relation to experienced or anticipated ecological losses, including the loss of species, ecosystems, and meaningful landscapes due to acute or chronic environmental change" (p. 275). Crossley intimates that the emergence of the COVID-19 pandemic brought people's unresolved feelings of ecological grief to the surface as they experienced exacerbated climate anxieties climaxed by Covid-19 agitations.

In line with Crossley, Casalegno et al. (2021) also assert that environmental distresses emanating from concerns about ecological crises such as the Australian wild fires which pushed plant and animal species to extinction, along with fervent climate justice activisms by governments and industry leaders (Becken & Curnock, 2022), burgeoning decarbonizing tourism agendas (Gössling & Scott, 2018), the loss of normalcy as the pandemic unfolded, and fears of an anticipated economic toll on populations has fueled an affective dimension of the crises and got people to pay attention to behavioral implications on society’s collective action.

Even though respondents strongly preferred in-person tours to virtual tourism forms in the post-covid era, they reinforced their ecological consciousness by mentioning benefits such as environmental friendliness, reducing waste and ecological footprint, and supporting local economies directly with proceeds earned from VTs as qualities of PIRTs, which could enhance their experience with the innovation. These perspectives from respondents, regardless of their minimal preferences for solely virtual tours, offer ample opportunity to further examine how psycho-social and environmental distresses, such as what is brought about by Covid-19, can impact tourists' decisions and experiences toward responsible consumption behaviors in the post-pandemic era.

Matters of tourists’ consumption behaviors remain pertinent due to the reciprocity of connection between the industry and the ecological systems or resources on which it depends. In this system, the human subject is regarded as an essential change agent as they potentially modify the environment and other components of socio-ecological systems through conscious consumption practices (Gasper, Shah, & Tankha, 2019). According to

Becker (2012), these practices translate into broader systemic patterns that enhance or strain sustainability goals and practices. Since individual and collective tourist behaviors are vital to achieving more sustainable tourism, stakeholders and policy makers are admonished to facilitate behaviors aimed at reducing the negative impacts of tourism activities through initiatives like long-term planning and substantial investments in low-carbon tourism schemes (Gössling & Scott, 2018). This course is believed to open up innovative pathways in tourism service delivery and consumption for the industry's future resilience (Sigala, 2020).

Regarding innovation development, Ramon-Saura et al. (2019) suggest that designing acceptable and economically efficient options would require an understanding of tourists' behaviors, preferences, and willingness to use. Additionally, destinations such as geoparks will need to live up to their commitment to preserving solid environmental, economic, and social foundations. Tourism businesses in such destinations will need to focus on service quality in the frameworks of advanced hygiene standards, green business models and processes, solidifying their efforts to climate change and effectively aligning operations with technological innovations (Efthymiou & Papatheodorou, 2020; Fassoulas et al., 2019).

5.4 Millennial Tourists' Perceptions of PIRTs

According to Nielson (2020), the shift to online purchases in the aftermath of the pandemic will receive an uptick compared to pre-pandemic times. A similar shift to technological tourism solutions has also been forecasted by Sigala (2020). Predicted upon the use of creative technological solutions to help offset physical mobility limitations during the pandemic, growing interest in the use of innovations such as virtual reality and augmented reality coming to the forefront of tourism product and service delivery have also been intimated by many (Gössling et al., 2020; Kim et al., 2021). However, the potential of the pandemic altering some established consumption patterns of tourist segments, such as Millennials, necessitates an understanding of their unique perceptions about and preferences for emerging innovations like PIRTs, in the context of post-pandemic tourism

usage (Floros et al., 2019). In line with efforts to tackle the above, this research analyzed Millennials students' perceptions about the PIRT innovation and some potential concerns respondents (or Millennials by extension) may have regarding its usage.

While previous studies postulated that Millennials were more interested in using technology instead of spending time outdoors (Aaron & Witt, 2011), this current research shows how the pandemic might considerably alter that perception. In this study, respondents revealed a somewhat contradictory opinion to prior studies, both through the minimal preference they give to VTs, as seen in Figure 4.3, and their heightened desires to discover cultures, explore communities, and visit family and friends in-person as top priority activities. Such choices also contradict previous research that warns of Millennials' overreliance on technology and their corresponding deficit of experience (Smith & Kirby, 2015). Some current research on Millennials' changing attitudes towards technology attribute the characteristic to a desire to escape from constant connectivity with work and school life in order to experience nature (Anderson & Baker, 2015; Clark & Nyaupane, 2022; Floros et at., 2019).

Yet, whereas millennials value experiences in tourism, the growing desire to engage and gain experiential fulfillment does not totally deter them from attaching to technology for tourism (Floros et al., 2019) based on safety, environmental stewardship, cost, exploring remote destinations before they undertake traditional in-person travels, or for the sake of other benefits they derive from using technological products in general (Table 4.6). To further understand what concerns respondents had if they were ever to take PIRT tours, a thematic analysis of open-ended questions was conducted. As explained in the Methodology, findings from the thematic analysis component of the study are used here to substantiate and provide deeper meaning to the quantitative results of the analysis.

The results echoed respondents' concerns about PIRTs usage in five main areas: engagement, quality of experience, accessibility, technology, and connectivity concerns, as presented in Figure 5.1. These findings corroborate a growing area of tourism innovation research that discuss shortfalls of virtual technology usage and its impacts on tourists' overall motivations and intentions to use them (Clark & Nyaupane, 2022). Further analysis of features that were likely to enhance respondents' experiences with the use of virtual tourism innovations revealed seven key qualities, namely: (a)quality of experience,

(b)destination exposure, (c)accessibility, (d) real-time engagement (with a personal tour guide), (e)technology and quality of resources, (f) system controls, and (g) benefits to locals.

5.4.1 Concerns about Quality of Experience

The emergence of VR innovations has led to their widespread use in tourism and hospitality settings (Gretzel et al., 2015). Continuous transformations that come with ICT innovations have resulted in well-informed and empowered tourists who desire better and more personalized experiences (Buhalis et al., 2019; Gretzel, Fesenmaier, & O'Leary, 2006). Experiential concerns about innovation use in tourism systems, therefore, stem from fears of having less exciting or less authentic outcomes in attempts to match memorable in-person tourism forms online. Tourists are also concerned about missing out on interactions with local community people, other tourists, and the destination itself in the virtual tour setting, which they would otherwise derive if they made their trips in situ.

Although some research has attempted to explain the effectiveness of virtual tourism technologies in replicating authentic environments and delivering realistic experiences (for example, Guerra et al., 2015), respondents in this survey predominantly disagree that their VT experiences will come close to the authenticity they derive from being present in destinations (Table 4.5). Some respondents wrote that:

> "The experience is not the same as in real life" - Respondent Q17R32
>
> "Not having the real experience, I would say. Less interaction with other people can make you lose physical and emotional connection to the place." - Respondent Q17R10
>
> "I don't really have a concern, but I guess that it just isn't a substitute for the real thing- getting to interact with people and be fully immersed in a different culture. It sounds like a good idea, but it won't feel like the real thing" - Respondent Q17R62

> "It seems to diminish the whole point of traveling. I travel to be immersed in places and spaces; to experience culture, and have a change of scenery. We spend too much time online, and it only further perpetuates our bubbled isolation." – Respondent Q17R43
>
> "I would rather see tourist destinations in person to get the real experience" -Respondent Q17R17
>
> "One has to experience the bust of water droplets hit your face, the sound of water whoosh in your ears! It's all about experiential feelings" - Respondent Q19R63
>
> "I do not enjoy technology, and I love sights, smells, and atmosphere of new places more than anything else" - Respondent Q19R103

These concerns can be viewed in light of Crawford et al.'s. (1991) interpersonal constraints of technology-related tourism, where participants miss the ability to co-create experiences with others on the tour. Kim and Hall (2019) identified that tourists' decisions are highly influenced by hedonic values of excitement derived from "being" in destinations. These values are more personal and appeal to tourists' emotional sense of excitement, enjoyment, or playfulness derived from the tourism experience. Tussyadiah et al. (2018) cite that such hedonic appeals could play an essential role in VR tourism by driving tourists' decisions to visit. Consumers' preferences for and eventual use of PIRTs as alternatives to conventional tours will thus be influenced by an evaluation of such hedonic values derived from the innovation. To the tourist demographic under study, this need raises concerns about whether or not PIRTs can be as enjoyable and offer authentic, immersive experiences.

On the background of these concerns, respondents also indicated a strong preference for interacting with other travelers (Table 4.4) and with a tour guide in real-time (Table 4.6) during the virtual tour. For the PIRT model, the inclusion of remote tour guides to facilitate real-time interactions is expected to help mitigate shortfalls arising from a lack of contact, as seen with other virtual tourism models (Fennell, 2020). Respondents also suggested including features that allow engagement with other users on the PIRT platform.

These could come along with control functions that enable users to pause, skip or choose how much time they wish to spend on each spot during the tour. Attractive features such as curated music, easter eggs, history, tasks, reward points, and live outdoor exercises were recommended by respondents to enhance the overall experience of PIRT tours. In line with Gretzel et al. (2020), respondents noted that such features would enable them experience virtual tours in more exciting and realistic ways. Some sentiments shared by respondents are highlighted below:

> "If they could find a way to do an immersive tour in virtual reality, that would be an incredible experience. It reminds me of the movie '*Ready Player One'* (virtual universe oasis)" - Respondent Q19R9
>
> "As lame as it sounds, achievements. By adding a light gamification or bonuses to exploring these virtual spaces, it would incentivize people to return or spend more time within this digital space" - Respondent Q19R18
>
> "Having tours on demand would be lovely, especially with the ability to pause and come back to it would be nice" – Respondent R19Q40.
>
> "We already spend too much time on a screen. Virtuality - although good for over crowding, environmental sustainability, I fear that technology is becoming normalized and impacting health way too much. Virtuality is a precarious step to take as community, connection, and relationships continue to diminish. If PIRT becomes a legitimate source of tourism, it is ESSENTIAL that tourists can connect with one another via camera". Facial expression is essential for connection. – Respondent Q17R46
>
> "People like to stop and look. What if, while the tour is going on, viewers could select an artifact that is within range and be able to pull up a bio of that piece as well as further imaging (perhaps even a digital model)? That way, they could further explore what interested them. This could be expanded to incorporating QR codes on exhibits to allow for further exploration" – Respondent Q19R48

> "Engaging with your guide and other users on the virtual tour platform will be intriguing" – Q19R74

> "The fact that I see places and learn about them beforehand, and if it is a destination where there is a lot of tourism, I most likely won't be overwhelmed in regard to my social anxiety" – Respondent Q19R9.

5.4.2 Accessibility Concerns

In addition to experiential concerns, respondents also cited concerns about accessibility in terms of cost, access to resources, time, and the availability of options for people with specific disabilities. The importance of the cost factor to travel decisions of younger populations' (Millennials) cannot be overemphasized (Schaeffer & Rainie, 2020). This is observed in earlier discussions on potential drivers of Millennial travel decisions, where respondents were noted to place much importance on cost considerations for their travel more than on destination image. The cost factor influencing respondents' choice for PIRTs considers the prices of accessing equipment and devices needed to take the tour, destination access rates, and a comparison of whether the overall cost of the VT package is worth the experience they derive from it. From these highlights, it would be fair to intimate that affordability of PIRT services can influence the amount of patronage the innovation receives. The following concerns raised by respondents confirm that cost is directly associated with accessibility and the form of tourism they will decide to undertake (Clark & Nyaupane, 2022).

> "Some people do not have the funds or ability to be able to travel, therefore, virtual tours still allow individuals to experience and see what tourism destinations have to offer." - Respondent Q21R17

> "Aspects of virtual tourism that are likely to enhance experiences is the ability to do it from home and its potential in the future. If it costs slightly less than it would to travel to the actual destination, it would give people who could not necessarily afford to travel a chance to participate and get a

tour despite their financial situation. For those people that cannot travel as well, such as they are sick in hospital or unable to leave their residence, it gives them an opportunity to travel as well than they may not have had before" - Respondent Q19R7

"My main challenge is whether the technology required to use it will be readily available and if it will be affordable" - Respondent Q18R109

"Cost of technologies or software. It will seem costly to pay for both technology, installed software or web applications and the service itself" - Respondent Q18R79

" ...another worry of mine is the cost, I understand how places still need to make money but I am afraid that if people are charged the same amount for a virtual tour than they would be for an in-person tour, it will cause some displeasure amongst participants or potential participants because they feel they are not getting the full/same experience for the amount of money they paid, which may reflect bad on the tours." (Respondent Q17R7)

Additionally, respondents noted that while PIRTs could offer accessibility options to people constrained by health and mobility challenges, the innovation may not suit the needs of people with visual disabilities or seniors who are not technologically inclined. Some respondent comments on accessibility are as follows:

"That it takes up less time than flying to a destination to see it" – Respondent Q19R60

"Not having to leave the house and go to overcrowded, expensive places" – Respondent Q19R51

"The eligibility to view and know places in terms of different countries, even before getting there" – Respondent Q19R116.

But while satisfying the needs of tourist segments like the visually impaired might be challenging to achieve in the short term, Buhalis and Darci (2010) suggested that considerations for the benefits of VTs to people with other forms of special needs such as hearing, mental health, cognitive disabilities, and sensitives can be studied and implemented. Challenges of unequitable access to technological resources due to social, health, or financial constraints might also affect the tourism experience of some Millennials. For this reason, some studies caution that recreational experiences facilitated through technologies must accommodate individuals with varied capabilities and be available in other languages to encourage diversified usage (Michopoulou et al., 2015).

Accessibility is a strategically significant consideration in tourism innovation design as addressing generational segmentation is. This is because the accessible tourism market represents a distinctive niche with unique characteristics and needs which tourism developers and destinations must meet (Darcy, McKercher & Schweinsberg, 2020). This market segment calls to question the possibility of developing and implementing PIRTs under the universal design philosophy where products are designed to be usable by all, regardless of their specific needs, to the greatest extent possible (Burgstahler, 2009). Given that respondents express positivity about cost, time, and destination access advantages of PIRTs, those features must be harnessed in central design considerations for the innovation. Accessibility considerations are essential preconditions for developing tourism innovations as they relate to inclusive, responsible, and sustainable tourism (Buhalis & Darci, 2010; Darcy, McKercher & Schweinsberg, 2020).

5.4.3 Technology and Connectivity Concerns

Some technological concerns about PIRTs highlighted by respondents include difficulties in using unfamiliar devices, shortfalls of devices that may not support the virtual tourism platform, application usage difficulties, lagging internet connectivity, high cost of accessing technology, and unappealing websites. Other problems indicated by respondents include screen time and eye health, focus from web distractions, information accessibility,

language barriers, software assistance by real people, as well as security and privacy concerns. To these, some respondents wrote that:

> "A main challenge of using virtual tourism technology is the challenge with all technology, how well it will work at all times. Depending on where a person is viewing the tour from, there may be lag that interferes with the tour or perhaps connection issues that interfere with the quality of the tour and gives it a bad reputation amongst participants. Someone may be kicked from the tour and unable to join again, others may lose audio or visual throughout it, and the employees may not always be able to fix the problems." - (Respondent Q18R7).

> "I think a challenge, in general, is the constant change/updates in technologies, making certain devices that PIRT may rely on obsolete." - (Respondent Q18R29)

Research has identified the positive role of virtual tourism innovations in advancing entertainment, information sharing, and diversification of the tourism product for the benefit of individuals and firms (Buhalis et al., 2019). These benefits are derived through the offering of tailored experiences to tourists due to the ability of VTs to access, gather and exploit tourist data as a way of gaining better insights about innovation users (Buhalis & Amaranggana, 2014; Sigala et al., 2015). Buhalis and Foerste (2015) identified that data for effective personalization of tourists' experiences range from basic information such as age, nationality, and gender to more specific data such as personal expenses, social media profiles, and real-time location updates of users. As these forms of data are regarded as highly sensitive user information, their requirements can raise security and privacy concerns regarding VT use among tourists. Technologies with potential impacts on privacy include QR codes, interactive touchscreens, information chatbots, biometric technologies, and recommender systems for destinations (Buhalis & Amaranggana, 2014).

Concerns about security, privacy, trust, and perceived risks thus remain critical issues in current digital tourism ecosystems (Buhalis & Amaranggana, 2014), as perils of

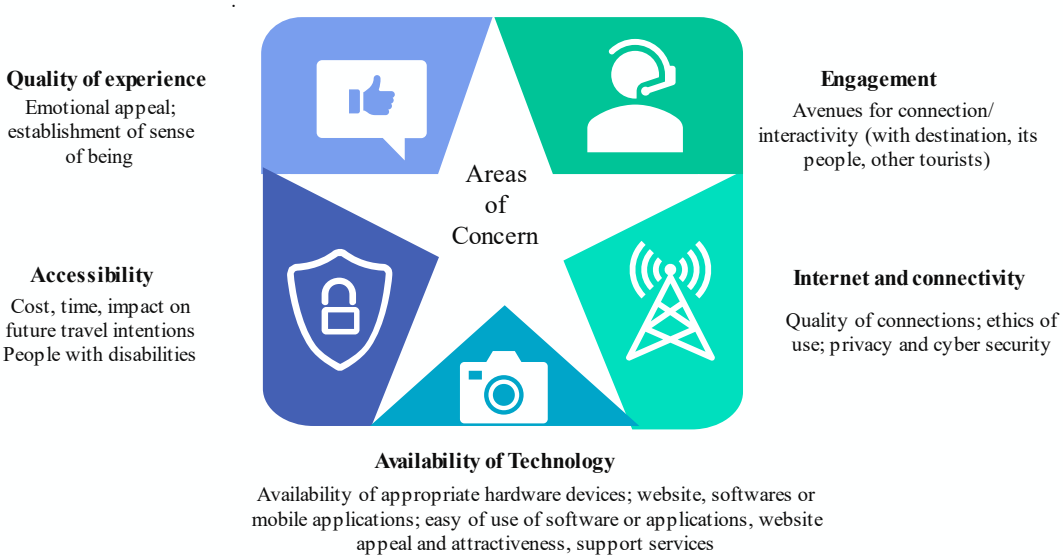
hacking central intelligence systems, location monitoring, tourist blackmails, abusive marketing strategies by companies, and governmental abuse of data continue to persist (Ioannou, Tussyadiah & Miller, 2021). Tourist perceptions about privacy and security concerns becomes a major influencing factor that shapes their behavior, the amount of information they disclose, and their response to the use of digital services in tourism (Ioannou, Tussyadiah & Miller, 2021).

In line with this concern, the data presented in Table 4.5 indicate that most respondents neither agree nor disagree that PIRTs will be the safest form of tourism in the aftermath of Covid. However, they strongly agreed that they would take PIRT tours to places where in-person travel was impossible due to health concerns. These perspectives point to possibilities for safety or security concerns to transcend physical health to respondents' safety in terms of using suggested VT technologies. It shows that the Millenial post-pandemic tourist in this study would not only consider their physical health and social protection in planning the tour, but would also make likely security considerations concerning their use of VT forms. This concern begs the need to identify and minimize security and privacy weaknesses related to tourists' use of digital innovation applications. Overcoming privacy and security issues would significantly impact tourists' acceptance and use of the innovation.

The relationship between nature-based ecotourism and technology is one that is viewed as both controversial and beneficial. In that, while innovations facilitate tourism opportunities for younger generations, they can also alter leisure experiences (Clark & Nyaupane, 2022). A primary weakness highlighted in this interrelationship by Smith and Kirby (2015) is the potential of VTs to decrease people's time and the quality of their experience on the tour. It is, therefore, not surprising that Millennials desire to minimize distractions that keep them from enjoying their virtual experiences as much as possible (Floros et al., 2021).

Figure 5.1

Respondents' areas of concern when taking PIRT tours in the future



5.5 Reconciling Tourist Decisions for PIRT Usage in the Context of Ethics

In the face of uncertainties over personal, social, and ecological consequences of consumption in crises periods, several studies have predicted shifts in tourists' consumption behaviors towards more sustainable, ethical, safe, and less costly tourism alternatives (Caruana et al., 2019; Higgins-Desbiolles, 2020; Mohr, Webb & Harris, 2001). Mohr, Webb, and Harris (2001) argued that socially responsible consumer behaviors involve usage and disposition decisions that are based on a desire to minimize or eliminate harmful effects and maximize the long-term beneficial impact of consumption on the environment and societies. According to Frey and George (2010), these behaviors may later translate into the need for new exchange relationships, tourism experiences, resources, and innovations to aid interactions between service providers (tour guides), tourists, and destinations. The literature from contemporary works like Gretzel et al. (2015) and Jokovic (2019) agree with the ideas of Frey and George (2010), and further suggest that if such changes are intended for resilient and long-term sustainable tourism futures, then

alternative pathways of consumption can become noteworthy considerations for adaptation.

From this study, respondents' strong preferences to return to travel soon, be in destinations at all costs, and even spend a little more to treat themselves on the trip suggests the potency of hedonic tendencies to drive tourism revival and Millennial tourist flows to destinations in the post-Covid era. On this basis, it is fair to perceive early utopian views of sustainability as unrealistic or unattainable due to conflicts between the Millennial's altruistic tendencies and their innate desire for authentic experiences (Gasper, Shah & Tankah, 2019; Kibert et al., 2012). However, the underlying influence of ecological consciousness on their travel preferences offers a chance to cultivate ethical ways of thinking through personal experiential obligations and consumption decisions in line with the greater good of society (Amantova-Salmane, 2015; Becker, 2012; Kibert et al., 2012).

Despite concerns about the many challenges respondents associated with PIRTs or their strong preferences for in-person tours, results from the study highlight their willingness to trade the experiential advantage they drive from being in destinations for the model if the results of their actions would yield ecological good. It is worth noting that this scenario speaks to a partial replacement of a traditional form of tourism with an alternative rather than forgoing traveling and tourism activities entirely. In instances where respondents did not show a willingness to trade advantages of being present, they still considered ways of relieving destinations off pressures of overtourism through conscious choices for less crowded locations. Again, we see a preference for an alternative instead of completely avoiding travel.

These findings revealed that whereas the Millennial may be unwilling to forgo their desires for travel and novelty entirely, aligning their hedonic proclivity to experience with moral concerns for the environment could potentially shape their desires and actions in powerful ways, as hinted by Caruana et al. (2020). Caruana et al. (2020) remarked that hedonism could not be simply abandoned by modern consumers who possess volatile needs and are in constant search for pleasure, joy, and acquisitions. Respondents demonstrated this in their willingness to replace original experiences with supposed "less authentic" virtual forms, albeit with recommendations for additional features which they believed would enhance their experiences with the latter alternative.

In line with Soper's (2007) concept of alternative hedonism, such an orientation towards tourism decision-making and consumption calls for satisfying one's pleasure in morally guided ways instead of setting morality in opposition to pleasure. Roubal (2019) describes this position as a spontaneous and reflective practice of consumers balancing hedonism with peace. Here, hedonistic values are reoriented from "predatory consumerism" forms (p204) towards more considerate, creative, economical, and meaningful attitudes. Goodwin & Francis (2003) admitted that ethical considerations offer "emotional recreation" (p. 273) and emancipation driven by consumers' desires to "feel good." Becken identified the advantage of such a viewpoint by noting how cognitive and affective factors influencing tourist typologies would become critical for the success of future environmental campaigns, as they allow a shift from traditional paradigms of revenue-driven tourism development to possibilities of incorporating ecological concerns into developmental initiatives and policies (Becken, 2020).

In the broader tourism sector, the development and incorporation of PIRTs as an ecologically friendly alternative may allow private, public, and academic stakeholders a chance to realign products and service development toward responsible yet resilient futures (Fennell, 2020). Most recent studies underscore the need for tourism businesses and service providers to understand the preferences of tourists to provide them with unique digital solutions that can boost customer satisfaction while enabling the incorporation of tourism ecosystem sustainability into their company objectives (Zenker, Braun & Gyimothy, 2021). Whether this stance offers a practical basis for valorizing the transformative affordance of the pandemic in line with virtual tourism development, as suggested by Sigala (2020), could become an important consideration in future industry reset discussions.

5.6 Implications of PIRT Investments in Niagara Geoparks

Considering the pace at which ICTs and digital innovations are impacting the tourism industry, some studies argue that destinations, stakeholders, and related management organizations will need to adapt themselves to emerging shifts in order to enhance

performance, collaboration, and success (Gretzel et al., 2020). This follows the realization that innovations such as VT technologies, which were formerly applied in tourism as "try-before-you-buy" tools (Buhalis & Amaranggana, 2014), would play a pivotal role in attracting people to tourism destinations in the post-COVID-19 era, while delivering temporary getaways for individuals who are reluctant or unable to travel due to health, mobility or safety constraints (Sigala, 2020). This viewpoint is favored by most respondents, who agreed that PIRTs would enable destinations like geoparks to expand their market reach (Table 4.8).

On an ecological tangent, the tourism industry's survival through the challenges presented by Covid-19 demands flexibility to adapt to innovations that do not just offer immediate business resumption or continuation opportunities but consider the well-being of individuals and socio-ecological resources on which tourism depends (Gössling et al., 2020; Higgins-Desbiolles, 2020). Sparviero and Ragnedda (2021) point out that if individuals, either as producers or consumers, holistically consider the environmental, social, and economic impacts of digital technologies, along with the personal benefits they derive from it when planning for sustainability goals, then a sustainable future would be more likely. In the Geopark setting, these advantages should characterize sustainability, education, local benefits, and tourist satisfaction (Dowling & Newsome, 2018; Farsani et al., 2014)

In line with this reasoning, some studies highlight examples of geopark destinations that have initiated the development of technological innovations such as VT services to enhance tourism activities, to promote collaboration between tourists and the territories in which tourism takes place, and to support local products and businesses (Fassoulas et al., 2019; Kim & Lim, 2019; Perotti et al., 2020). In this study, respondents supported the need to implement VT innovations such as PIRTs in NPAGG destinations by expressing their benefits in terms of environmental impacts, economic growth, and socio-cultural benefits to the Niagara region. Direct benefits of accessibility, destination promotion and marketing, business continuity, and impacts on local people were predominantly highlighted by the respondents.

5.6.1 Environmental Befits of PIRTs to Niagara's Geopark tourism

The current generation under study places some importance on the ecological consequences of their tourism behaviors and are willing to align their behaviours to the same. Of the outlined benefits PIRTs could offer, they rank highest the environmental impact of the innovation (Table 4.8), citing its potentials to help control demand, curb overtourism and support climate change advocacies in open ended responses. Some respondent comments are as follows:

> "Yes, because it will help with overcrowding" - Respondent Q22R1

> "I've attended some virtual events such as local wine tastings that were great" - Respondent Q22R3

> "I think this can be a great technology for those willing to choose a virtual holiday. This will reduce the demand on places which suffer from overtourism" - Respondent Q22R20

> "Virtual Touring will become a more popular option with increasing advocacy for the effects of climate change" -Respondent Q22R62

> "I think if more money goes into online tourism, there will be less crowding, and it will be safer, easier, more accessible and enjoyable to view tourist locations" - Respondent Q22R35

> "Could help the locals. Less tourism could be beneficial for residents. As well, health and safety wise it is better during a pandemic" - Respondent Q22R8

> "Niagara is too overcrowded. If PIRT can guarantee reduced tourism, I think it is useful. However, I worry PIRT will encourage people to come and visit in real life, increasing overcrowding" - Respondent Q22R46

During lockdown periods, the ecological impacts of tourism were remarkably materialized. Reduced green-house gas emissions, cleaner air quality, recuperated water and soil ecosystems, cleaner beaches, and wildlife sightings in urban spaces drew the scientific community's attention to the impacts of lockdowns on environmental health. The situation supported existing concerns that linked global ecological change due to human behaviors as major threats to sustainability. Given insights into tourism's significant role in addressing global environmental problems, there continue to be increasing calls for tourist behavioral changes to support continuity of the positive environmental impacts in post-pandemic times (Higgins Desboilles, 2022; Caruana, 2020). Government and industry leaders are also called upon to consider policies that lessen the likelihood of ecological calamities such as climate change, environmental degradation, and other looming zoonotic pandemics. This standpoint is essential because while the pandemic damaged economies and individual health, societies continue to contend with the global dangers of environmental issues, including climate change, rising global temperatures, floods, droughts, and disease outbreaks.

Moving away from broader environmental changes to local problems of overtourism that affect destinations, studies have shown that heavy domestic and international visitations have given rise to overtourism in Geopark destinations. This, in turn, leads to congestion, inappropriate resource use, ecological damage, pollution, and waste disposal issues (Cahyadi & Newsome, 2021). Overtourism results from having too many visitors within a destination at a particular time beyond the destination's carrying capacity (Dodds & Butler, 2019). The problem attracts significant interest and concern in the tourism sector due to the industry's continuous growth trajectory (Butcher, 2021).

For Niagara geopark destinations which are faced with balancing a delicate connection between local economic development and the uncontrolled influx of tourists, innovations like PIRTs may become a creative restrictive option to help relieve congestion. In instances where some sites may require temporary closure to allow them regenerate, the PIRT VT model can be instituted to ensure eco-responsible consumption and business continuity.

5.6.2 Destination Marketing potentials of PIRTs in NPAGGs

Studies on the influence of ICTs on tourist information acquisition and destination choice decisions have seen tremendous growth in recent years. Several studies discuss the effectiveness of mobile technologies, internet connectivity and social media connections in conveying destination information to tourists before, during, and after their trips (Buhalis, 2021). Evidence of the use of contemporary VT innovations to deliver the benefits mentioned above while offering alternative pathways for consuming tourism has also been studied by many (Fassoulas et al., 2019). VT models have been identified to have the ability to project remote and inaccessible destinations to the outside world by removing distance barriers and providing destination information to tourists before they finalize their travel decisions (Buhalis & Amaranggana, 2014). In Niagara's geopark tourism sector, the PIRT innovation can thus serve as a practical destination marketing tool that provides tourists with pre-purchase trial experiences, allowing tourists to have a real foretaste of their intended trips before deciding to undertake them (Kim et al., 2021).

Fassoulas et al. (2019) observed that the geotourism concept binds landscapes, historic experiences, local culture, and human activities into a distinct touristic product which can be promoted through geomarketing. Beyond communication of the temporal and spatial dimensions of geology or geomorphology, Pralong (2006) asserts that geomarketing enhances the interpretive and educational abilities of geoparks. The PIRT innovation can become a tool to increase NPAGG geomarketing possibilities through the promotion of geopark location information, histories, and affiliated business to the broader international market. Through its use on mobile devices or applications, tourists can easily undertake diverse kinds of activities ranging from finding information about geopark locations, accessing or booking accommodation facilities, and learning about Niagara histories (Farsani et al., 2014; Boes, Buhalis & Inversini, 2014; Buhalis & Amaranggana, 2014).

For the technologically savvy Millennial tourist who sees technological products as beneficial in general (Table 4.5), making available such timely information on suitable mobile devices can directly impact their pre-visit decisions and potentially affect their satisfaction in the whole travel cycle. The model can become an essential geopark destination marketing strategy for Millennials because, with or without a crisis, the Millennial cohort is of particular interest, considering their growing purchasing power in

the coming years and their ability to influence younger generations (Damanik et al., 2020; McAdams et al., 2021). As a social generation characterized by heavy peer influence, Millennials are more likely to save money for future travels to destinations recommended by their peers, either through word of mouth or through online mediums like websites, social media, or travel blogs. To the Millennial tourist, a peer's critique of a destination becomes a more legitimate testament than claims by a local tourism marketing board (Chu & Choi, 2011). Their impressionability lends the question of how Geopark destinations in Niagara can take advantage of the current state of disruption, as consumer behaviors are in a flux, to realign tourism strategies and offerings in innovative ways that foster social, environmental, and economic resilience.

Interactivity developed between tourists and geopark destinations through the co-creation and sharing of information on PIRT platforms may open up new relationship frameworks and advance the efforts of destination marketers towards offerings of more personalized marketing and services. Geopark destination managers and marketers can realign their expenditures and marketing strategies towards more location-based, instant marketing, and cross-selling approaches in order to capture the interest of this growing tourist segment at interregional, national, and international levels (Buhalis & Foerste, 2015; Sheth, 2021).

Capitalizing on PIRTs to meet the needs of Millennials would open opportunities for growth, new experiential markets, and the development of a resilient mode of tourism that aligns with geopark goals and post-Covid resilience agendas. Tour guides can lead different groups of people from across the world through experiences that allow (remote) travelers to immerse themselves into and learn about local cultures in the Niagara region. Collectively, these benefits can incentivize tourists to travel in person or through virtual means. Respondents in this study capture the destination marketing capabilities of PIRT usage in NPAGGs under three major areas. They include (a) opportunities for the outside world to explore Niagara; (b) promoting interests in destination (Niagara) knowledge and histories; and (c) projecting indigenous cultures. To these benefits, some respondents commented that:

“I think since Niagara is a main attraction site in Ontario, it would help other people from other countries explore it, and if they get the chance to come to Niagara in person, they would come because they have been able to get a glimpse of the beauty that’s encompassed in it” - Respondent Q22R14

“By expanding on virtual tourism, it would enable such histories as the underground railroad and the Niagara region’s past to be brought forward’ – Respondent Q22R18

“I think the key attractions (The Falls, NOTL vineyards) require in-person viewing/tasting to be worth paying a monetary fee. The tourist-traps (aka Clifton Hill) are not necessary, so those could be done online. But the tourists only know about those sites because they encounter them onsite” - Respondent Q22R29

“Can introduce a new demographic of tourists to the Niagara Region” - Respondent Q22R38

“Future is moving to VR, people will want to explore before going to destination” - Respondent Q22R39

“Investment in the virtual tourism industry will incorporate more tourism sites in the Niagara region. Currently, some of the popular sites are still not available virtually” - Respondent Q22R56

“The idea will provide added destination marketing benefits to the region” - Respondent Q22R79

“It will be an excellent marketing option for the region” - Respondent Q22R113

5.6.3 PIRTs for Business Continuity and Regional Economic Growth

Besides destination marketing benefits of PIRTs, respondents also noted the model's prospects for enhancing tourism business continuity in the Niagara Region through diversified product offerings, increased participation in tourism activities, and opening avenues for more job opportunities. Following lockdowns and mobility constraints brought on by the pandemic, the commercial usefulness of VT innovations which were predominantly regarded as destination promotional tools and objects of futuristic experimentation, to a large extent, were brought to the forefront. Confinement regulations during the outbreak sparked the accelerated use of VTs as a new form of tourism to keep destinations and demand alive (Gretzel et al., 2020). Extending this importance of VTs to PIRTs in post-pandemic times, the model can be imagined as an alternative solution for technophiles, pregnant women, children, or people many do not have the financial means and/or time necessary for in-person trips to access NPAGG destinations. As the costs of VTs remain relatively less compared to in-person travel costs, the possibility exists for increased participation in Niagara tourism from a wider global market who may otherwise be unable to afford the luxuries of in-person travel.

Moreover, the PIRT innovation can be employed to stimulate actual tourism due to its destination marketing properties. Nonetheless, the influx or departure of tourists from places that maintain maximum allowable capacities has both environmental and economic repercussions. Whereas limiting tourist inflows allows destinations to curb issues of overtourism, the same can negatively affect revenue inflows for the said destination. In such a scenario, strategically positioning the innovation as an alternative for generating revenue while tackling environmental concerns becomes a vital consideration for destination managers.

Further studies point to the ability of VTs to enhance a destination's competitiveness (Shoval & Birenboim, 2019), particularly in terms of price, accessibility, marketing, and product authenticity, which are critical considerations for the Millennials in this study. Authenticity has especially been earmarked as an essential factor for the economic resilience of tourism. This is because tourists' perceptions about the genuineness of a destination's offering can inform their loyalty and impact the rise or decline of tourism

activity in that location (Park et al., 2019). For destinations in Niagara's geoparks, Indigenous tourism through the PIRTs platform could become a potential niche market with an international competitive advantage; allowing the region to project its unique Indigenous histories and traditions to the world while preserving the same against acculturation that may result from the influx of tourists. Additionally, the presence of online stores and business listing pages that provide information on affiliated businesses in the food, accommodation, or transportation sectors could support online product sales on the platform.

However, the lack of immersive solutions in many existing VTs come against their strength to offer alternative high-end experiences to tourists. Given the crucial value (Millennial) tourists place on experience, the possibility of improving VT experiences lie at the core of many destination development agendas (Gossling et al., 2021, Gretzel et al., 2020). It thus becomes essential that researchers continue to emphasize the incorporation of immersive components such as high-resolution visual technology and exciting narratives to boost the quality of VT experiences and their overall commercial value (Fennell, 2020). The PIRT model would offer this advantage in tourist VT experiences by advancing and building on other VT forms to combine aspects of multisensory (i.e., visual and auditory) engagement through appropriate technology and real-time engagement with a tour guide at the destination (Fennell, 2020).

Although some sensory factors, such as the smell of the air, the feel of the weather at a specific moment in time, or the stress of climbing up a hill, may not be directly encountered by the tourist, the human representative on-site builds a sense of spatial presence by bringing those sounds, sights, and feelings as close to the remote tourist as possible. This can be done by manipulating related technology and communicating all other sensory experiences in real time to the tourist's psyche (Fennell, 2020; Kim et al., 2021). According to Kim et al.'s. (2021) two-dimensional construct of self-location and possible action on Millennials' pre- and post-Covid experiences, such visualizations of spatial presence and possible actions in a PIRT-mediated environment can "positively influence tourists' perceived enjoyment, and evoke user curiosity and intentions to visit the attraction featured in a VR experience" (p. 202). Intentions translated into actual visits would ensure business continuity in destinations.

Some respondents wrote that:

> "Yes, because while things are slowly evolving to a world more adjusted to Covid-19, there are many places in the Niagara region that rely on tourism and have been struggling these past couple of years with the pandemic and lack of tourism occurring. Having virtual aspects to attractions can help them still make some money and stay open for business" - Respondent Q25R77
>
> "It wouldn't hurt to diversify our tourism portfolio" – Respondent Q21R6
>
> "I think a mix would be helpful if it would still contribute to the local tourism economy" -Respondent Q21R62
>
> "Offers a quick-fix tourism solution when you have limited chance to travel" - Respondent Q22R80
>
> "We do not know when we will be forced into another lockdown" - Respondent Q22R64

Advancing PIRT implementation in Niagara's geopark destinations would require technical and human resources investments to facilitate its operational centers or connected retail outlets. From professional tour guides to software/application developers, photographers, videographers, artists, and destination managers in virtual travel agencies, the PIRT innovation could encourage employment for professionals and freelancers who rely on the gig economy.

Further, some respondents in this study hold the view that the world is in a volatile period where no one can accurately predict what other distractions the future will bring. For an industry upended by the pandemic, a way forward will be to plan/prepare for the unknown. In the event of the unknown, VT Innovations can offer the added advantage of developing new viable tourism models for unprecedented situations which befall tourists and destinations alike. The PIRT model thus provides a viable business alternative that serves both the goals of conservation and economic sustainability for destinations. The present Covid-19 scenario teaches that such an alternative would be necessary in case the

industry or the world is beset with similar forms of disruptions in the future. In line with the NPAGG's goal of economic sustainability through tourism, PIRTs can become a profitable component of the region's tourism model as it contributes to economic sustainability through competitive business continuity and job creation. Respondents in this study ranked second the economic benefits of incorporating PIRTs in NPAGG destinations after environmental benefits.

5.6.4 Socio-cultural Impacts of PIRT Investments in NPAGG

Some of the most remarkable advantages of virtual tourism innovations to consumers, tourism service providers, and destinations are linked to the socio-economic and environmental benefits derived from their use (Flew & Kirkwood, 2021). Such benefits are noted to fundamentally contribute to the achievement of sustainability goals if they align with values of equality, harmony with the environment and society, and offer initiative for achieving our shared future. In this study, respondents communicated the socio-cultural relevance of PIRTs in NPAGG the terms of accessibility and the innovation's impacts on local communities and stakeholders.

Accessibility potentials of PIRTs were highlighted in terms of the innovation's ability to: (a) serve the needs of people who could not travel due to conditions such as busy work schedules, traveler anxieties, time constraints, health considerations, and mobility disabilities; (b) provide tourists the chance to reach rural or remote locations; (c) become an alternative option which caters to the interests of different audience such as VT enthusiasts; (d) offer affordable and safe means of seeing destinations. These advantages address the accessibility concerns of cost, access to resources, and provisions for people with specific disabilities, highlighted by respondents in Figure 4.9.

Accessibility considerations are essential preconditions for developing tourism innovations as they relate to inclusive, responsible, and sustainable tourism (Buhalis & Darci, 2010). In geopark development particularly, this condition is necessitated by the fact that contemporary geotourism developments extend beyond the confines of natural areas to other places that offer possibilities of geological significance (Newsome & Dowling,

2010) but which may be protected, rendered inaccessible, or out of the tourist's reach due to several reasons. Under such conditions, PIRTs can allow tourists access those locations through mobile phones or smartphones. Some respondent remarks on this are as follows:

> "I believe there are many benefits to allowing the option for providing a virtual experience for those who cannot travel for an in-person tour" - Respondent Q22R5

> "I think so, yes, but only for things like historic sights or buildings that would require capacity limits, things like nature walks and trails should not be a virtual experience because, in order for the positive effects of nature to occur, you have to physically be there"- Respondent Q22R9

> "Some people are not like me, and they may be more concerned with traveling to see destinations. Having multiple options to cater to different audiences is a good thing" - Respondent Q22R11

> "Although I can see most people preferring in-person tourism, there are some people who either they themselves or someone they live with is immunocompromised, and going out to in-person tourism destinations can be damaging to their own health and/or the health of others" - Respondent Q22R13

> "So people who want to stay home for safety reasons can still enjoy Niagra Falls" - Respondent Q22R28

> "Provides options for people. Persons with disabilities and others who may have physical limitations or other limitations or who even just have a preference for this. Provides an option to increase participation" - Respondent Q22R37

Dowling and Newsome (2010) predicted that contrasting visitor attitudes and heavy visitor demand would become significant considerations for future geotourism development and success. Following the onset of the Covid- pandemic, Dowling and Newsome's (2010) predictions have become even more pertinent as people have altered their behaviors in striking ways. From socializations to corporate events to education, consumers are figuring out new ways to fulfill their needs through a mix of traditional and new technology-enabled methods. Bona et al. (2020) recognize how younger Millennials, especially, are leading the way in making these changes. It is, therefore, agreeable to find respondents giving thought to their contrasting interests in the discussion for PIRTs usage in Niagara geopark destinations.

Beyond locational access, respondents were of the opinion that PIRTs could become a cheaper alternative to conventional travel as major costs such as airline ticket fares, hotel accommodation rates, and per diems incurred during traditional long-haul trips are eliminated during the virtual tour. This expectation is besides concerns about the affordability of technology, software, or the quality of VT service itself. Also, considering peoples' experiences with the pandemic, some studies have predicted that perceived or real health risks associated with traditional in-person or long-haul travels to destinations will linger in the minds of tourism consumers for long (Clark & Nyaupane, 2022). Health and safety risk perceptions thus encourage the potentials of VTs like PIRTs as the go-to source for uninterrupted, interactive, and less-risky experiences for tourists from the comfort of their own private spaces. Respondents shared their thoughts on this by commenting that:

> "Some people do not have the funds or ability to be able to travel, therefore, virtual tours still allow individuals to experience and see what tourism destinations have to offer." - (Respondent Q22R17)

> "Given the popularity of the Niagara region for Canadians and international travelers, it may be worth exploring the plausibility of virtual tourism for the area, especially considering that Niagara region has some of the highest covid cases in Ontario" - Respondent Q22R50

> "Would be great for people who might want to desist from travel after Covid 19" - Respondent Q22R78

A core aim of geoparks is to promote local cultures and economies through conservation, education, and geotourism (Farsani, Coelho & Costa, 2014). As a form of tourism geared towards the appreciation of nature, cultural cohesion, and projections of traditions and lifestyles in sustainable ways, geotourism places high importance on effective collaborations between destinations, Indigenous communities, and other stakeholders (Dowling, 2013). Weis, Chambers, and Holladay (2021), in their study on community-based tourism development and resilience in small island developing states, emphasized the role of stakeholder collaborations, power sharing, and participation in building sustainable social capital for local tourism. They noted how sustainability and resilience in community-based tourism could be strengthened through the understanding of local perceptions of community resilience dynamics, the involvement of local stakeholders in identifying assets, and the inclusion of residents in the tourism development planning process.

Dowling (2013) emphasized that although the range of stakeholders in any tourism society may be extensive, those directly involved in daily operations are very important and should not be left out of the planning process. For Indigenous people and societies situated in destination regions, this participation process would open pathways for knowledge sharing, cultural interchange, and identity preservation (Farsani, Coelho & Costa, 2014). From economic opportunities to cultural sustainability to local community development, the benefits inherent in such a move would extend well beyond the specific geopark destinations themselves.

Positive cultural exchange through promoting local products, handicrafts, cuisines, festivals, and lifestyles on the PIRT platform would offer avenues for supplementary income generation. Increased investments in developmental projects for local communities can also be effected using income generated from PIRT tours. Financial contributions generated from a component of PIRTs costs can be used to subsidize geoconservation projects, support community education and research goals, fund vocational or skill training for local people, or offer capacity-building and mentoring programs for Indigenous or local tourism businesses.

In addition to interactivity enhancements, Buhalis and Amaranggana (2014) recognized that smart destinations are successful at providing more personalized and enhanced experiences through stronger levels of interconnection among stakeholders in the smart service system. As such, destinations that wish to improve tourist experiences should open up stakeholder collaborations during the process of incorporating virtual innovation in the physical world. This move is in line with the ideas of Boes, Buhalis and Inversini (2014), who acknowledged smart destinations as places that employ ICTs for enhancing tourist experiences and organizational performance to yield greater, jointly provided, co-creation of value.

Neuhofer and Buhalis (2014) agree that the future of destinations rely on their ability to constantly orient themselves towards co-creation with tourists while utilizing appropriate technological tools. In the Niagara tourism context, developing digital tourism infrastructure such as PIRTS would support increased collaboration and communication among key stakeholders comprising Indigenous communities, Indigenous leadership organizations, destination management organizations, governmental representative bodies, and tourists. Such partnerships would facilitate flexible knowledge flow, capacity building, improved experiential offerings, and overall sustainable development of the region's tourism product.

Bornhorst et al. (2010) note that stakeholders form an essential component of any destination. Hence strong collaborations among them is crucial for a destination's success. When the needs of various stakeholders are detected, reflected upon, and considered in line with the development and implementation of digital innovations such as PIRTs, the resulting impact of collaboration, agility, and capacity development will yield sustainable results for any destination.

CHAPTER 6 - CONCLUSION

6.1 Summary of Key Findings

Tourism is perhaps the most vulnerable industry due to its high susceptibility to external and internal shocks. But as shocks in the industry reveal transformations that shape tourism activity and drive industrial growth and adaptability, the industry's survival in the face of many adverse challenges indicate continued demand for travel and tourism (WTO, 2020). A foray into the literature reveals how factors such as the widespread use of technological innovations like social media and the internet continue to impact consumer travel behaviors, destination marketing activities, and business processes. In addition, noticeable changes in tourist needs and preferences due to changing market characteristics, ethical considerations, and external risks like disease outbreaks continue to demand the institution of new tourism forms along with the restructuring of old patterns.

The most recent driver of change and accompanying challenges for 21st-century tourism has been the onset of the novel Coronavirus pandemic. Since the outbreak in early 2020, the tourism industry has been challenged by rapidly changing dynamics of human behavior brought on by health and safety concerns. But while these changes present unprecedented challenges to the industry, many believe they also offer adaptation and resilience-building opportunities (Sigala et al., 2020; Fennell, 2020; Gretzel et al., 2020). The many tourism outlets who desire to take advantage of these opportunities should consider prospects along the lines of employment, market growth, and offering of alternative convenient or cost-effective services to address consumers' ever-changing needs. Technological advancements in virtual tourism service provision have, especially, aided the latter and led to the creation of simplified, cost-effective processes across several sectors of the industry; a trend many predict has come to stay. Whether or not future tourists will fully embrace virtual technologies in the pursuit of their tourism needs remain a question yet to be fully answered.

This study assessed the impacts of the Covid-19 pandemic on future tourism preferences of Millennial students. The goal was to ascertain whether and how the current shifts to technological solutions and concerns for ecological good experienced during the pandemic potentially influenced millennial tourists to consume tourism differently.

Through an exploratory analysis, this research provides evidence that shows which forms of tourism Millennial students would like to experience in the aftermath of the Covid-19 outbreak, in line with the first objective of the study. Findings revealed that regardless of people's experiences and the shift to technology use during the pandemic, conventional domestic and international tours would be preferred by some Millennials over virtual tours. Virtual tours through models like PIRTs would not replace in-person visits in post-Covid times. Respondents expressed a desire to return to in-person tourism forms where they can discover cities and architecture, engage with family or explore nature. This, they hope to do in as early as the first six months after the pandemic is declared over. They predominantly desired to mix international and domestic tourism forms but would include virtual tours if conditions demanded.

In answer to objective 2 of this research, which was to investigate the factors that will influence Millennial students' preferences for virtual or conventional tourism forms, findings clearly showed that virtual tours through models like PIRTs would not replace in-person visits in post-Covid times. Although the model is perceived as a high-quality alternative for accessing sensitive sites, the PIRT VT tourism may concern only a part of tourist segments, perhaps the most technophile, people curious about exploration, or those faced with limited financial, mobility means, or time for taking trips.

However, even though virtual PIRT tours are not necessarily destined to replace travel, they possess features that could transform tourism in NPAGG destinations and provide environmental, economic, and socio-cultural advantages. On this basis, most respondents supported the option to invest in VT innovations like PIRTs to support the current mix of tourism/recreation resources in the Niagara region. This finding was in answer to research objective 3.

But while the anticipated increase in tourism activities among Millennials is likely in the early days after the pandemic is declared over and opens up opportunities for prosperity to destinations and tourism businesses, a more significant challenge is presented to the industry in its fight against climate change, as more travel, whether domestic or international, would mean higher CO_2 emissions (IEA, 2020). Contrary to positive outlooks, the tendency to return to business-as-usual among Millennial travelers in the post-Covid era, conveyed in their desire to predominantly undertake international travels

as they did in pre-Covid times raises questions about whether proposals to reset the industry would translate into equitable or sustainable ends. Consequently, resolving tensions between the desire to "go back to normal" and the pursuit of ecologically rich futures remain a puzzling agenda in post-Covid tourism rebound discussions.

6.2 Limitations

Although this study made significant contributions to scholarship on the topic of post-Covid tourism consumption patterns, some limitations exist. A key challenge relates to the impact of Covid-19 restrictions on mobility, which affected the study's methodology and data collection. While the current techniques and methods used in the study were appropriate for recruiting and collecting rich empirical data, there were gaps that would otherwise be mitigated by the initial methods suggested for data collection.

For example, the project's initial intent to collect rich qualitative data through focus groups and survey responses failed to materialize due to mobility and contact constraints. International travel restrictions in place during the data collection period prevented direct access to focus group participants. As a result, rich narrative and observational data, which would have been beneficial to substantiate some findings in the study, were lost.

Again, the absence of in-person school sessions at the time of data collection presented challenges of accessing an appropriate representative sample of Millennial students for the study. This constraint led to choosing the convenience sampling technique in selecting respondents for the online survey. However, this method comes with its weaknesses, especially in terms of ensuring the representativeness of the data collected among the broader student population. Since participants were recruited conveniently, there is the possibility that perspectives articulated in the study are limited in scope and risk yielding ungeneralizable results. This limitation is acknowledged, despite efforts to recruit students from a wide range of disciplinary backgrounds within the university community.

6.3 Recommendations for Further Research

This research aimed to gain insight into potential changes in travel behaviors brought about by Covid-19. The project attempted to offer a way to view such changing dynamics of human actors and their underlying drivers through the ethical lenses of alternative hedonism. Overall, the study contributed to knowledge surrounding emerging concerns of Coronavirus on tourism futures, the prospects of alternative tourism models such as virtual tours, and their potential applications in aspects of Niagara Geopark Tourism.

Although this research focused on assessing the travel preferences of Millennial students, it remains to be confirmed whether the characteristics identified (a) are by virtue of their status as students and (b) can be generalized among a wider millennial population or not. Further studies are thus recommended to investigate populations like working-class Millennials, Millennial students in other Canadian Universities and provinces, different consumer segments such as seniors, people with disabilities, and generational segments like Baby Boomers, and GenZ to expand insight on this topic.

From the destination's perspective, further research on tourist perceptions about other forms of geopark tourism the PIRT VT innovation could be applied to beyond nature-based destinations is suggested. Such studies will help expand understanding of the application of PIRTs in broader geopark settings. Additionally, empirical research involving simulations or prototypes of the PIRT innovation will pave the way for understanding its applicability in real-world contexts. And that can possibly form the basis for further testing and development to meet tourist demands, the geopark's development goals, as well as the broader global sustainable agenda.

From the supply perspective, studies on technological innovations in post-Covid tourism are relatively in infancy. There remains a crucial need for stakeholders, destination managers, policymakers, and tourism enterprises to also examine and understand the connections between transformations brought about by Covid vulnerabilities and the ways in which they shape consumers' perceptions or preferences for certain kinds of tourism services. As there is no single way to critically assess the relationship of the industry with its resources and actors, adopting a more collective appreciation of societal phenomena, emerging innovation, and changing consumer dynamics allows for a holistic understanding

of the dynamic nature of the industry. By doing so, tourism service providers and practitioners will be better prepared to deal with threats, adapt to change, and embrace opportunities for transformations as they happen. Further research is needed to understand how PIRT innovations can be translated into competitive tourism products to foster alternative tourism in the Niagara Region.

On theoretical grounds, the introduction of ethical concepts such as alternative hedonism encourages interdisciplinary research that captures tourists' perceptions of virtual tourism and evaluate whether synergistic developments could truly reduce the potential for conflicts. Assessing this connection on the basis of morality or ethics will potentially lead to a better understanding of the changing markets and business environments within which they operate. Also, other empirical studies which measure perceived tourist behavior against specific parameters such as health, cost factors, personal values, ecological grief, perceived experiences, and environmental consciousness in the post-Covid context are recommended to validate findings made in this study and promote insight into the topic.

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Appendix - Research Questionnaire

Section 1 – Assesses Respondents' experience of Covid 19 and how it might influence their future travel preferences/behavior)

1. Did you travel during the pandemic?
    - ○ Yes
    - ○ No
2. Where was the destination of your most recent vacation/leisure trip?
    - ○ International
    - ○ In my country
    - ○ In my region
    - ○ Virtual
3. When do you plan to return to leisure travel after the pandemic is declared over?
    - ○ Within 0-6 months
    - ○ In 7 to 12 months
    - ○ After a year
4. What would you like to do most when you travel after Covid?
    - ○ Relax on the beach/explore nature
    - ○ Visit family and friends
    - ○ Take guided tours
    - ○ Attend events or concerts
    - ○ Discover cultures
    - ○ Explore cities and architecture
    - ○ Visit historical sites and monuments
5. What is the typical average duration of your holiday?
    - ○ 1 to 3 days

- ○ 4 to 7 days
- ○ More than seven days

6. Based on your experience with Covid 19, how would you consider the options in the table below when making a tour decision?

	Strongly Disagree	***Disagree***	***Neither agree nor disagree***	***Agree***	***Strongly Agree***
Budget is a primary factor when I'm planning a trip					
I go on holiday to treat myself, so I don´t mind spending a bit more.					
I'd welcome the opportunity to engage with locals and partake in local culture					
I'd like to meet and interact with other travelers					
The image, popularity, and prestige of the destination are more important to me than the cost.					
I prefer private tours to avoid risk of exposure to diseases and infections					
I'd choose a less popular destination if there will be few tourist crowds.					
I will choose a destination close to my region of origin					
A virtual tour is a likely option for me in the near future					

7. What was your most preferred form of tourism in pre-covid times?
   - ○ International travel
   - ○ Domestic travel
   - ○ Virtual tours

8. What form of tourism do you plan to undertake in post covid times?
   - ○ Domestic
   - ○ International
   - ○ Virtual
   - ○ Domestic and international

- ○ A mix of domestic, virtual and international
- ○ Domestic and virtual
- ○ International and virtual

Section 2 - This section assesses respondents' preferences/perception of Personalised Interactive Real-time Tours (PIRTs) as a favorable surrogate to conventional ecotour in the aftermaths of Covid 19.

The PIRT model is a form of smart or virtual tourism that allows tourists to remain home while employing local guides to facilitate virtual tour experiences. The model involves the use of digital technology, including mobile phones and computers, to deliver personalized, interactive, real-time tours between remote tourists and tour guides.

9. How many times have you used a virtual tour service?
    - ○ Never used
    - ○ 1-2 times
    - ○ Three time
    - ○ More than 3 times

10. What are your general impressions about PIRT tours?

	Strongly agree	***Agree***	***Neither agree nor disagree***	***Disagree***	***Strongly disagree***
I think live and on-line tours are as good as in-person travels					
A PIRT tour is a good opportunity to explore the local destination before I arrive					
A PIRT tour is an ecologically friendly form of tourism					
PIRT tours will be the safest form of tourism in the aftermath of Covid					
I think virtual PIRT tours are less costly compared to traditional long -haul travels					
I see mostly benefits from using technological products in general					
I'd like to interact with a tour guide in real-time during the virtual tour process					

11. How would you consider PIRT tours in the following contexts in post-covid times?

	Strongly agree	***Agree***	***Neither agree nor disagree***	***Disagree***	***Strongly Disagree***
I will take PIRT tours because I am intrigued by technology					
I will choose PIRT tours because that form of tourism saves time					
I will always choose PIRT tours if it enables me to cut down on budget					
I will take PIRT tours instead of in-person travel if it helps to reduce overtourism in destinations					
I will take virtual PIRT tours to places where in-person travel is not possible due to health concerns					
I will take a virtual PIRT tour because it is conveniently accessible on a mobile/ computer device					
I will take PIRT tours if it means environmental conservation for a destination					
I prefer to be at the destination at all cost					

12. How much do you averagely spend on a conventional in-person tour?

    - ○ Less than CAD 500
    - ○ CAD 501-1000
    - ○ CAD 1001-2000
    - ○ Above CAD 2000

13. How much are you likely to spend on a virtual PIRT tour?

    - ○ Less than CAD 500

- ○ CAD 501-1000
- ○ CAD 1001-2000
- ○ Above CAD 2000

14. How much time online are you willing to spend on a PIRT tour?
    - ○ Less than 1 hour
    - ○ 1-3 hours
    - ○ 4-6 hours
    - ○ 6-12 hours

15. What will be your main concerns of taking a virtual PIRT tour in the future?
    .....
    .....

16. What features about virtual tourism are likely to enhance your experience with PIRTs?.....
    .....

Section 3 – Assessing implications of PIRTs on Niagara's Geopark Tourism

This section gauges the perception of how virtual tourism innovation fits into Niagara's regional tourism economy. The aim is to know your thoughts about PIRT use in some of Niagara's Geopark destinations based on your experience with covid and your future travel preferences.

17. How many times have you traveled to attractions in the Niagara region in the past 15 moths?
    - ○ Never
    - ○ Once
    - ○ Twice

- ○ Three times
- ○ More than three times

18. Do you think there is a need for investment in virtual tourism innovations to support the current mix of tourism/recreation resources in the Niagara region?
    - ○ Yes
    - ○ No

19. On a scale of 1 to 5 (with 5 being the highest positive impact and 1 being the lowest positive impact), rank the benefits of incorporating virtual tourism in Niagara's geopark destinations in terms of the following:

	1	***2***	***3***	***4***	***5***
Managing environmental impacts on destination *(such as reducing CO2 emissions, preserving nature and wildlife, tourist waste production, energy consumption)*					
Economic growth (*new job opportunities*)					
Destination marketing					
Access to destination					
Socio-cultural Impact *(preserving cultural authenticity, intercultural relation between local people and tourists)*					

20. What role do you think smart tourism innovations such as PIRTS might play in the sustainable development of Niagara's tourism economy?

    .....

    .....

<u>Section 4 - Demographic profile</u>

21. What is your gender
    - ○ Female
    - ○ Male
    - ○ Other (Specify)……

22. Age range

- ○ 15-17
- ○ 18-21
- ○ 22-25
- ○ 26-30
- ○ 31+

23. Present Educational Level

- ○ Undergraduate
- ○ Graduate (Masters)
- ○ Graduate (Ph.D.)

24. Which of the options best describes your status

- ○ Study permit/International
- ○ Permanent Resident

25. Which city are you living in?

- ○ Niagara Region
- ○ Outside Niagara but within Ontario. (Please specify)

  …….
- ○ Outside Ontario but within Canada
- ○ Outside Canada (Please specify)

  ……..

26. What is your annual household income (before/after tax)?

- ○ Less than CAD 5000
- ○ CAD 5,001 to CAD 10,000
- ○ CAD 10,001 to CAD 15,000
- ○ CAD 15,001 to CAD 20,000
- ○ Over CAD 250,000

27. Do you have a disability?

- ○ Yes
- ○ No