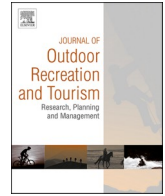Contents lists available at ScienceDirect

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Research Article

"To use or not to use" - Mobile technology in nature-based tourism experience

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ABSTRACT

This study investigates the role of mobile technology in the three stages (pre-visit, during-visit, and post-visit) of nature-based tourism (NBT) experiences. By employing collaborative autoethnography and reflexive thematic data analysis, this research explored the NBT experiences of four researchers who participated in a nature-based trek. The findings revealed that in the pre-visit stage, mobile technologies enhanced the NBT experience by enabling the flow of information for planning and mediating the anticipated experiences. Mobile technologies supported tracking well-being, documenting, and sharing the experience online in the during-visit stage. In the post-visit stage, mobile technologies allowed for reliving, reflecting, and sharing the experience. Using mobile technology in this NBT experience also led to some negative experiences, specifically interruptions that resulted in some participants' inability to truly immerse themselves in the experience. This study adds to the existing body of literature on NBT, highlighting the implications of technology, particularly mobile technology, for NBT experiences that can be capitalised on by visitors and destinations/service providers.

Management implications: The study provides important managerial implications that suggest mobile technology can influence the experience in the three stages of an NBT experience. In the pre-visit stage, destinations/service providers must provide information (e.g., on the website) that is essential in planning the experience. In this stage, marketing the experience to attract visitors is also essential, leaving clues to create anticipation for the experience. In responding to the during-visit stage, creating photo opportunities and placing information about the place (e.g., flora and fauna) and identifying the area of internet availability will enhance not only the during-visit stage but also the post-visit stage when viewing and sharing the photos to reflect and relive the experience. The study also offers opportunities for how mobile technology can be used for sustainable tourism.

1. Introduction

Nature-based tourism (hereafter NBT) is one of the fastest-growing segments within the tourism industry (Line & Costen, 2017). Prior to COVID-19, NBT in protected areas attracted 8 billion visitors worldwide, generating approximately US$ 250 billion per year in consumer surplus and US$ 600 billion per year in direct in-country expenditures (Balmford et al., 2015). The reason for this nature-based travel is its broad spectrum (Fredman & Margaryan, 2021), which includes various forms of tourism such as eco-tourism, adventure tourism, wildlife tourism, and outdoor tourism (Ali et al., 2022; Weaver, 2001). This is because the concept of NBT can be understood as travel activities motivated totally or partially by interests in the history of a place or natural beauty, combining elements of adventure, education and frequent recreation. NBT has garnered significant focus from scholars mainly because nature-based experiences are a core product of many destinations, and there is immense interest and a critical motivating factor for people to travel (Albrecht, 2021; Fredman & Margaryan, 2021).

With the advent of mobile technologies and their utilization in NBT experiences (Clark et al., 2022; Clark & Nyaupane, 2022), scholars and tourism providers have turned their attention to the connection between NBT and mobile technology (Yılmaz & Olgaç, 2016; Clark et al., 2022). For instance, Clark et al. (2022) studied the distinction between millennials' and providers' use of mobile technology in NBT. For tourism

providers, mobile technology presents opportunities for marketing and relationship building (Chekalina et al., 2021; Gaffar et al., 2022). Indeed, research suggests that, since its emergence, mobile technology has affected the hospitality and tourism industry substantially (Buhalis & Law, 2008; Law et al., 2018). Studies show increasing interest in using mobile technology amongst tourists to enhance their experience, including NBT experiences (Buhalis & Amaranggana, 2015; Ghaderi et al., 2019). On the contrary, this pervasiveness of mobile technology has been linked to digital addiction, which has been subjected to critique and backlash. For instance, trespassing in the habitats of animals for an Instagram picture (Shaheer & Carr, 2022).

As a result of the growing interest in mobile technology and its use in NBT, there have been calls to develop this scholarship (Albrecht, 2021; Coghlan & Carter, 2020). Furthermore, previous research has pointed out a gap in studies regarding the perception of using mobile technology when partaking in NBT (Clark & Nyaupane, 2022; Mehlhaf, 2019), mainly when "tourists will remain ambivalent towards the use of mobile apps in the NBT context" (Chekalina et al., 2021, p. 230). Understanding the role of mobile technology in NBT is specifically important since mobile technology has become an indispensable part of every life (Kim & Kim, 2017). Moreover, in times like this, with the pandemics like COVID-19 putting a hold on international tourism, research on this topic is increasingly valuable since there is an increasing interest in domestic tourism, including natural areas around one's own country of residence (Fredman & Margaryan, 2021). According to Albrecht (2021a, p. 2), "little is known about technology with respect to the different stages of the visitor experience." In response to filling this gap, we applied the three steps model of tourism consumption of communication and information needs (Gretzel et al., 2006) in travel experience (Wang et al., 2014) using retrospective collaborative autoethnography (hereafter RCA) (Tripathi et al., 2022) in NBT experiences. Therefore, this research aims to investigate the role of mobile technology in the NBT experience.

2. Literature

2.1. Nature-based tourism (NBT)

By identifying the broad nature and sub-categories of NBT, Fredman and Tyrväinen (2010, p. 181) defined NBT as "human activities occurring when visiting nature areas outside the person's ordinary neighbourhood", but also encompasses the "protection, management and utilization of natural resources" (Fredman & Margaryan, 2021, p. 15). The latter part of the definition essentially differentiates NBT from other types of tourism, where NBT focuses not only on getting benefits from nature but also on assisting direct conservation of biodiversity. For example, travel to NBT destinations has advanced the preservation, donation, and security efforts of nature in various countries such as Kenya, Bolivia, and The Philippines (Spenceley, 2021). In the present context, when NBT focuses on comprehensive cultural interpretation and integrative ecological restoration (Zhang et al., 2021), research on NBT can promote empathy (Wang et al., 2023) and solidarity towards nature and non-human animals (Nautiyal & Polus, 2022), especially when mobile-technology also impact the biodiversity (Kim et al., 2020).

Moreover, NBT is crucial in supporting rural communities (Aazami & Shanazi, 2020). For example, NBT in various tropical rainforest national parks in Sabah (Malaysia) combine volunteer tourism and rural tourism for multifaceted benefits to national parks, local villages, travellers, and other economic benefits (Jaafar et al., 2013; Polus & Bidder, 2016). On the other hand, NBT experiences benefit visitors from a physical and psychological health perspective (Wang et al., 2011; -Spenceley, 2021). These experiences in a nature-based environment are called nature-based experiences or NBT experiences (Albrecht, 2021).

Generally, a tourist experience is an individual psychological phenomenon responding to tourism products and services (Packer & Ballantyne, 2016). In reference to NBT, the products and services offered to visitors are based on protected landscape areas, national parks, nature reserves, nature treks and trails. In addition, the ancillary services like rental cars and accommodation around the nature destination are also part of the total tourism experience. Like any other tourist experience, nature-based experiences are also personal, subjective, and respond to the activities, settings, and events in a particular time and nature space (Kurniasari, 2019). To realise this, the NBT experience starts before thinking about the exact nature of the destination to visit. Therefore, the period of consideration for a nature-based experience can be divided into pre-visit, during/on-site-visit and post-visit stages (Ballantyne & Packer, 2011). Existing studies have explained these three stages from multiple perspectives (Ballantyne & Packer, 2011; Gretzel et al., 2006; Park & Santos, 2017; Wang et al., 2014). These research mainly investigates how to know/measure pro-environment behaviour, attitudes, and gain nature-based knowledge across three stages quantitatively (Ballantyne & Packer, 2011; Chubchuwong et al., 2015). This leaves a knowledge gap needing a more in-depth understanding of the NBT experiences across the three stages.

2.2. Mobile technology and NBT

The idea of information communication technology (ICT) as an integral part of tourism has been widely noted in the literature (e.g., Neuhofer et al., 2014; Wang et al., 2012). ICT plays significant roles in the production, facilitation, and co-creation of the tourist experience (Neuhofer et al., 2014) within any phase of the travel process: the anticipatory, the experiential and the reflective (Gretzel et al., 2000). ICT, particularly mobile technologies, are "small, easily carried and practical to utilise in most tourism contexts" (Dickinson et al., 2016, p. 194) and have an "anywhere and anytime" connection (Floros et al., 2021, p. 753) that offers various functional purposes, including planning, communicating, information search and sharing, entertainment and emotional support (Conti & Farsari, 2021; Wang et al., 2014). Navigation, accessing digital guides and information on tourist sites, and sharing travel experiences (not only during but also before and after the journey) is the most reported use of mobile technology in tourism (Brown & Chalmers, 2003; Dickinson et al., 2014). Thus, scholars have argued that mobile technology can mediate both behavioural and psychological dimensions of travel experiences (Tussyadiah & Fesenmaier, 2009; Wang et al., 2011).

However, numerous scholars warn that ICT use in any tourism setting can interfere with and even alter the tourist experience (Neuhofer, 2016). As an integral part of the lifestyle, mobile technology affects the tourist experience in various aspects, remarkably for those who have a strong attachment to the phone and need constant connectivity (Neuhofer, 2016). Travelling in technology "dead zones", which refers to "service disruptions, lost smart-phones, inability to find a 'free Wi-Fi hotspot', or insufficient bandwidth" (Paris et al., 2015, p. 805) can lead to distress and a sense of bereavement (Vincent, 2006). In addition, with the limitless information available online, information search through mobile not only transforms the tourism experience but also influences how tourists perceive a destination (Wang et al., 2012).

It is no doubt that mobile technology allows tourists to keep in touch with family and friends, but the same mechanisms prevent them from truly immersing themselves in the destination. In other words, while this digital elasticity (Pearce, 2011) is acceptable (or necessary), mobile technology brought what Gergen (2002, p. 47) called "absence presence", meaning "one is physically present, but is absorbed by a technologically mediated world of elsewhere" at the destination. Literature indicates that the always-connected addiction to mobile technology interrupted and impaired solitude and reflection (Tussyadiah, 2013; Wang & Fesenmaier, 2013). Additionally, knowing exactly what one will see and experience in a destination may inhibit individual discovery as at least most unknown elements have been eliminated. Thus, the experience is no longer derived from an interaction with the destination but an interaction with the technology (Conti & Farsari, 2021; Gretzel, 2010).

The use of mobile technology in tourism has resulted in a growing body of research on the NBT experience (e.g., Chekalina et al., 2021; Clark et al., 2022; Clark & Nyaupane, 2022). NBT provides a particularly ideal context to explore the impact of mobile technology on the tourist experience as it draws tourists to "being outside of the ordinary'' in the undisturbed phenomenon of nature to 'away from it all' to achieve various senses of self and connections to the nature (Fredman et al., 2012; Vespestad & Lindberg, 2011, p. 2). This is captured by the escape motive in NBT literature (Kim et al., 2015; Mehmetoglu & Normann, 2013). However, mobile technology is likened to altering the idea of escape (Neuhofer, 2016). Accordingly, studies have largely focused on examining mobile technology use in NBT as it either enhances or disrupts the experience and technology as a barrier or an opportunity to experience the natural environment (Dickinson et al., 2016; Tribe & Mkono, 2017). For example, mobile technology has been reported to cause tourists' loss of a sense of place, disengagement, and disembodied experiences in nature-based experiences (Gretzel, 2010; Tribe & Mkono, 2017).

Other areas of study include the trends related to disconnection in the form of 'digital detox' and 'digital switch-off' (Gretzel, 2014; Lay, 2014). Current research has investigated the concept of "to use or not to use, " emphasising connectedness and disconnectedness in NBT (e.g., Conti & Farsari, 2021; Dickinson et al., 2016, p. 196). For example, Conti and Farsari (2021) examined tourists' desire to 'disconnect' from mobile technology in nature-based experiences. The decision to disconnect tends to come from a desire to have (some kind of) control over the connectivity that allows a continuous flow of information, orientation and safety purposes while outdoors. Consequently, partial disconnection is perceived to have control over this situation (Conti & Farsari, 2021). However, research on mobile technology use and value creation in nature-based experiences and the tourists' desire to unplug from technology in NBT is a relatively understudied topic that requires further investigation (Conti & Farsari, 2021). Using NBT as an arena to study the impact of mobile technology includes some crucial differences and challenges since nature-based tourists are not a homogeneous group (Albrecht, 2021a; Fredman & Margaryan, 2021). As such, nature-based tourists need to be examined according to their travel behaviour, particularly their use of mobile technology in relation to NBT.

2.3. The three stages of NBT and mobile technology

The NBT experience starts with a 'pre-visit stage', a crucial part of the journey that involves searching, comparing, and planning the visit (Chekalina et al., 2021). The availability of information on promotional material, the internet, and other knowledge sources creates different perceptions in the visitor's mind (Bertella, 2016). However, with the evolution of interactive and immersive technologies such as mobile applications and nature destination-based video games, a person might have already become emotionally attached to the place, affecting the anticipated subjective experience (Shaheer, 2022; Soliman et al., 2017). Thus, the pre-visit stage becomes the first interaction of nature-based destination(s) and humans via mobile technology, which might be limited to planning and information gathering (Neuhofer et al., 2014) and affect NBT experiences during the actual visit. Moreover, existing literature on 'pre-visit to the nature destination' focuses on understanding the visitors' environmental knowledge, behaviour, and attitudes (Wheaton et al., 2016). Nevertheless, the "mobile apps functionalities that are already available to various NBT segments" (Chekalina et al., 2021, p. 225) and their use might vary considerably during the three stages of travel. Thus, mobile technology somehow modifies the (anticipated) experiences.

The next stage, the 'during-visit', also known as the on-site experience, plays a central role in enhancing the traveller's satisfaction with the total NBT experience. The experience depends on the favourable conditions at the nature destination, such as parking space, weather, crowd, activities, and maintenance (Wheaton et al., 2016). Even though

these conditions can be checked during the pre-stage, various uncontrolled changes at the nature destination may exceed or lower the experience. For example, even a pre-planned guided tour of a tiger reserve does not guarantee the sightseeing of a tiger to visitors (Responsible Travel, n.d.). Hence, if a tiger is not visible, the expected experiences of this nature-based trip might not be achieved. Thus, the during stage affects the overall experience, directly affecting the post-visit experiences. The during-visit stage is one of the most researched stages in NBT, where mobile technologies are used for various functions depending upon the reachability of the internet, such as visitor tracking, digitally interpreted guided tours, geotagging in (real-time) social media applications, photography, and videography (Conti & Lexhagen, 2020; Hallo et al., 2012; Newsome et al., 2012; Soliman et al., 2017).

The last stage of the NBT experience involves travellers recalling or recollecting their NBT experience. Existing studies showed that it is impossible to process the total NBT experience cognitively and affectively in the on-site stage alone (Ballantyne & Packer, 2011); therefore, the 'post-visit' stage allows both visitors and managers to reflect upon this experience (Hughes et al., 2011). By constructing the post-visit attitudes, behaviour and knowledge, the visitors, thus, express their revisit intentions and recommendations through word-of-mouth or/and technology (Fredman & Margaryan, 2021). This buzz behaviour of visitors allows the managers of nature destinations to act by planning the overall NBT experience.

As Ballantyne and Packer (2011) have explained, the post-visit stage continues the during-visit stage to process the overall NBT experience. The use of mobile technology in this stage is not limited to experience recollection but is also used in information gathering and knowledge sharing (Chekalina et al., 2021). Thus, if used, mobile technologies affect and alter the NBT experience, both positively and negatively. However, as the motivation of many NBT visitors is "connecting with nature", where well-being is a significant component (Capaldi et al., 2015, p. 2), mobile technology usage can alter this experience. In this regard, there is a continuum of visitors, where on one end, some visitors might not use mobile technology at all. In contrast, on the end of this thought, some NBT visitors might also use immersive technologies and video games to be at the nature destination beforehand (Alamäki et al., 2019). However, there is less possibility that all visitors will be in the same category when going on a group tour to a nature-based destination. Thus, some visitors may also get disrupted by mobile technology indirectly.

Hence, there is a need to address these stages using qualitative techniques to provide a more in-depth understanding of personal behaviour (Fredman & Margaryan, 2021; Rantala, 2011). Notably, there is a need to study NBT experiences from qualitative approaches such as autoethnography, allowing a more intimate understanding of the experiences (Jirásek & Hanuš, 2022) and adding nuances to the growing body of NBT studies. By appreciating the visitors' subjectivity to mobile usage, we investigate the role of mobile technology in NBT experiences by becoming participants.

3. Methodology

This research aims to investigate the role of mobile technology in the NBT experience. To do so, the researchers undertook the approach of RCA (Tripathi et al., 2022), a research method branching out of (auto) ethnography. Situated within the orbit of ethnography, McCurdy et al. (2004) define autoethnography based on culture, which they explain as the knowledge that a group of people uses to understand the experience and generate behaviour, and ethnography as simply discovery and description of that culture. Moreover, Anderson (2004) links ethnography closely to the concept of folk ethnography, which they explain as a kind of people observation that an individual conducts intending to gather social evidence that either supports or transforms their perspective of social life. Autoethnography shares its roots closely with

Anthropology, which is not about the anthropologists' self but is informed by it. Thus, auto-ethnography is a promising and intriguing qualitative method that emerges from postmodern philosophy and gives importance to voicing personal experience(s) to contribute toward better sociology (Wall, 2008).

In recent times, autoethnography has gained more popularity as a qualitative research method and has branched out into several sub-methods, such as collaborative autoethnography and RCA. Specifically, in the case of outdoor recreation and nature-based activities, these methods enable us to analyse complex and emotional aspects (Buckley, 2019). Oxymoronic as it may sound, Chang et al. (2013) describe collaborative autoethnographic (CAE) as a research method that is simultaneously collaborative, autobiographical and ethnographic. They define CAE as "a qualitative research method in which researchers work in a community to collect their autobiographical materials and to analyse and interpret their data collectively to gain a meaningful understanding of sociocultural phenomena reflected in their autobiographical data" (Chang et al., 2013, pp. 23–24). In order to minimise the risk of too many or overpowering voices while introducing diverse perspectives to the argument, it is suggested that three to five researchers are ideal when practising collaborative research (Chang et al., 2013).

Drawing inspiration from this, we have adapted RCA as a research method for this enquiry. Tripathi et al. (2022) have identified RCA as a method of research where more than one researcher engages in autoethnography after the event or experience has already occurred, therefore doing so in retrospect. Here, the researchers analyse the material collected through autobiographical notes, diary entries, journal entries and recorded media. In so doing, this method also faces the challenges of recall bias and increases subjectivity. While these are some limitations of this enquiry, we try to minimise these challenges to some extent using multiple voices and analysing the event in hindsight using RCA.

The experience site for this nature-based trek was Taieri River, Otago (New Zealand), where the researchers organised and participated in a trek called Taieri Millennium Track and Taieri River Track which are lightly trafficked back trails (Figs. 1 and 2). Both these tracks go through different terrains offered by the forest and end at the Taieri River Mouth. The circuit provides an elevation gain of 302 m and is around 10 km long, shared by hikers, mountain bikers, walkers, and runners. After a week of completion of the trek, the researchers (P1, P2, P3, and P4) planned to investigate the role of mobile technology centred on the researchers' NBT experience (see Fig. 3).

The research participants have all had experience with nature-based activities, including trekking, hiking, mountain bike riding, and other outdoor indulgences. P1, who was a part of organising this activity, has previous personal and professional experience in NBT and indulges in mobile technologies with moderate activity on social media. P2 is a flora enthusiast who has lived in the forest periphery for 18 years and has done nature-based outdoor activities as personal experiences. P2 is moderately indulged in mobile-based technologies and is moderately active on social media. P3 has professional and personal experience in outdoor nature-based activities and is the least indulged in mobile technologies and social media. P4 has personal experience with outdoor activities and is actively indulged in mobile-based technologies and social media. The participants know each other in a professional and personal capacity.

The material collection process starts with the group of participants partaking in an event while recording individual observations using diary notes, mobile notes, pictures etc. At a later stage, we, as a group, decided to engage with this material for the purposes of research. Thereafter, material from all participants was collected, and we, as a group, conducted a reflexive thematic analysis (Braun & Clarke, 2019). Considering and bringing to light the importance of methodological researchers knowing their stance and position and the importance of the centrality of researchers' subjectivity and reflexivity, Braun and Clarke

Fig. 1. Taieri River Track (Photo by author).

(2019) refer to thematic analysis as reflexive thematic analysis. Moreover, thematic analysis enabled us to work towards theoretically informed themes across material(s) collected as compared to the analysis of individual material(s) by itself (Sundqvist, 2023). The six phases followed for this analysis followed as per (Braun & Clarke, 2021) were group material familiarisation; coding the material; group material meaning-making and theme development; reviewing and further developing themes as a group; refining, defining, and naming themes in the group; and group writing the report. As a group, we ensured everyone was heard and maintained a consensus throughout every phase. Initially, the information collected was revisited, analysed, and key points were noted during group sessions. These key points were then clubbed together as sub-themes, such as the role of WhatsApp and websites in mediating visitor experience, using a mobile phone to amplify the experience when there, the role of WhatsApp groups at different stages of the activity, clicking pictures, taking videos and how different participants perceive the usage of mobile-based technologies.

While various sub-themes emerged as a process of this analysis, we will present our findings in three stages, pre-visit, during, and post-visit. Discussions and decisions on the research methods and findings were made through group consensus to ensure rigour and credibility (Roy & Uekusa, 2020).

4. Findings

Thematic analysis of the role of mobile technology in the NBT experience revealed eight major themes. The findings are presented in three phases of participants' NBT experiences: pre, during and post-visit.

Fig. 2. Taieri millennium and river track (source: Department of Conservation, 2022).

4.1. Pre-visit stage

4.1.1. Mediating the expected experiences

At the pre-visit stage, technology is noted to play a key role in mediating participants' knowledge, behaviour, and attitudes towards the NBT experience (Wang et al., 2011). With the advancement of technology, planning a trip has never been easier as there is no shortage of materials detailing everything about the destination. Nevertheless, the large volume and easily accessible knowledge and information may lead to information overload and potentially alter the whole experience (Tussyadiah & Fesenmaier, 2009; Wang et al., 2011). In this context, the group leader (P1) functions as the bridge between the participants and the availability of online information. P1 noted:

> I was aware that I had to be very crisp in providing the information on the WhatsApp group regarding the track. I searched a lot of websites like alltrails.com and doc.govt.nz … on youtube to know the accessibility and safety. I was trying to maintain a balance while broadcasting the information on the Whatsapp group. I want to give them as much information, but I also do not want to alter other participants' expectations. (P1)

P1 expressed that it is critical to strike a balance in a way that ample practical information was provided while keeping some of the mystery alive for the participants to discover during the trip. As the group leader, P1 not only aimed to provide balanced information about the trek but also prioritised the safety of the group.

4.1.2. (Un)spoiling the future tourism experience

Following the above discussion, however, the use of online information within the context of personal trip planning varied between
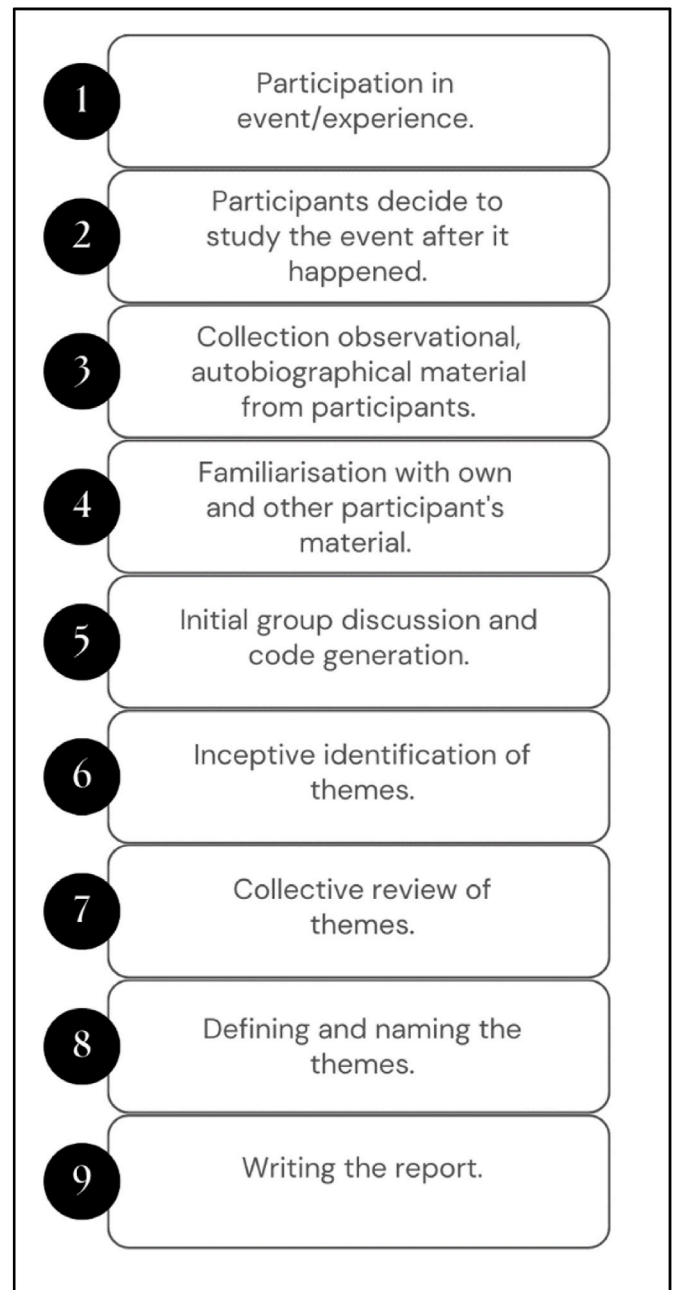

Fig. 3. Representation of retrospective collaborative autoethnography and reflexive thematic analysis (Informed by Chang et al., 2013; Braun & Clarke, 2021; Tripathi et al., 2022; authors).

participants. For example, participants expressed the shared information had been enormously helpful in preparing for the trip and, importantly, educating them on what to expect during the trip, as pointed out by P2:

> … my mobile rang, and I checked that P1 had shared something on WhatsApp. I quickly clicked on the youtube link to know about the track's terrain and prepare accordingly. I started building my expectations by comprehending my existing information about New Zealand's flora and fauna. I started dreaming about our future trek. (P2)

However, P3 was in collocation with this belief, as observed in the comment below:

> P1 shared the information with the group. I saw that P1 had shared many details like trail name, duration, distance of the trail, and some

website links. I did not care about the links. I do not want to spoil my experience. I want to live in the moment. (P3)

The heterogeneity of the behaviour and attitude of P2 and P3 clearly illustrates how they perceive the use of technology in NBT experiences. P2 prefers to explore the nature destination virtually before being physically present at the destination. In this case, the usage of technology is largely focusing on eliminating most of the elements of the unknown. Contrastingly, P3 believe in exploring the elements of the unknown and being present at the moment, celebrating the opportunities for surprising, thrilling discoveries during the trip. Notable in this regard, both P2 and P3 created a stage for their expected NBT experiences by looking from the lens of an 'outcome' and a 'process'. The focus of P2's NBT experience was largely on the 'destination' of the experience, whereas for P3, it was the 'journey' of the experience that mattered the most.

4.2. During-visit stage

4.2.1. Experiencing the nature

Though it has been established that mobile technology may interfere with people's experience in nature-based travel (Brown & Chalmers, 2003), it is, however, a subjective experience. The importance of mobile technology in mediating appreciation of the NBT experience is exemplified in P2's comment:

I wanted to see more and more and absorb the landscape. However, I have already seen many things in my Google search before doing actual trekking … I was experiencing trekking through that embodied trekking, so that is why I think watching those videos did not affect me. It made me more aware so that I can get absorbed more and more into the atmosphere and can connect my precious lived experiences with my current ones. Also, as I am a nature freak, I was constantly using my premade guide of plants of New Zealand on my mobile. (P2)

On the other hand, P3 was against this approach of technology mediation and chose to be disconnected during the trip. P3 explains this in the following comment:

Oh my god! I do not like when people talk while trekking, which focuses more on nature. Though my problem was not them talking, my main concern was when they were explaining to me what was coming next in our trekking. I do not want to know; that is why I did not search on the internet beforehand because I want to discover the things that were undiscovered by me. (P3)

This juxtaposition of P2 and P3 illustrates the subjectivity of NBT experiences. With the benefit of online knowledge and information, P2's NBT experience is focused on mediated and interpreted NBT experience (Albrecht, 2021). On the other end of the scale, however, P3's decision to explore without being connected to technology is focused on the serendipitous NBT experience. In this way, it is right to argue that P2 has a less clear distinction between mobile mediated/technology nature experience (Hassan & Ramkissoon, 2021) and embodied nature experience (Tribe & Mkono, 2017), while P3 is clear in desire for pure(?) unmediated nature experience (Breves & Heber, 2020).

4.2.2. Tracking health

In association with other health-tracking gadgets, mobile technology is another factor that can increase the mobile/technology-mediated nature experience, as stated by P1:

I was ready with my mobile phone and my Apple watch, which allows me to record various things such as every step, pulse rate, and all these things to know what my body can take at maximum. I had already decided to know my strength and my capacity. (P1)

The predetermined usage of technology in this trekking by P1 greatly

affected their experience (Brown & Chalmers, 2003). Since the objective of this nature of the experience for P1 was also to measure their capacity, the experience, in this case, was intertwined with a personal desire to use technology to mediate the experience (Hassan & Ramkissoon, 2021) and to achieve their personal goals. Contrary to this, P3 was not happy about this, as exemplified in the comment below:

I do not understand why people want to track everything. Can't they live without technology for just 8 hours? I actually put my mobile in the car so that I can have full technology devoid of experience. And then I have to hear how many steps they took during the whole trip. Ah! hate it. (P3)

The above reflection highlights P3's frustration with some participants' obsession with technology, which does not allow them to be fully immersed in the experience, but also potentially causes friction in the group connection.

4.2.3. Recording every moment

Mobile technology is heavily used to either record or connect. It also explains the desire to either showcase 'being there' or 'done that' to themselves or others. This is well illustrated by P1 in the comment below:

I carried my mobile phone. As an amateur photographer, I wanted to click as many pictures as possible. My phone's storage function further helps me categorise the photo as per dates and facial recognition so that I can see that in the future. I clicked pictures of nature, rivers, mountains, and how my other colleagues were enjoying trekking. (P1)

For P1, it is essential to click pictures of nature for experience building and maintain that experience for a longer-term, such as in the post-visit stage. However, P3 criticised this by stating:

People are crazy. They wanted to click photographs so they could enjoy the whole trek. I was not happy when my friend was taking the picture when they could enjoy the landscape by themselves. I was also a part of a selfie forcefully, but I hate it. I do not want to get stored in someone's gallery. (P3)

The aversion to the usage of mobile technology in this trekking was towards escapism (Neuhofer, 2016), whereas P3 is purely focused on embodied experience. Regardless of P3, for P4, mobile technology was a medium to share the nature experience with friends using social media, as observed from P4's comment:

I wanted to share my trekking experience with my friends, and social media is the best medium. However, I was furious when I could not find any network. So, I was then walking fast to get to higher grounds to talk to my friends and upload pictures. Through me, they watched these beautiful landscapes when they could not travel here. (P4)

However, the anxiety of "furious" illustrates what Paris et al. (2015, p. 805) call "dead zones", which essentially lead to distress for P4. Further, this experience of sharing and being there with near ones affected P4's experience during and post-visit stages.

4.3. Post-visit stage

4.3.1. Reconnection experience

Although mobile technology and social media platforms opened up opportunities for travellers to share their travel experiences as the journey unfolded, participants generally agreed that they only shared their experiences after the trip ended. The findings support prior studies that suggest the use of mobile technology in experience-sharing is not limited to the during-travel stage but at any stage of their travel periods (Fotis et al., 2012, pp. 13–24; Kim & Fesenmaier, 2017). Participants expressed that experience-sharing, like photos and/or videos with others, helps to 'relive' the trekking moments and recollection process.

Indeed, Wang (2013) argues meaningful outcomes of travel experiences are significantly increased when travellers communicate with each other, as noted from P3's comment below:

> After we all got back home, the WhatsApp group exploded with photos and videos. It was fun to look at the photos taken by other members, especially when you were in the shots. At that moment, the flashback came when I was hesitant to participate. Convincing myself to join the trekking was a challenge, but I am glad that I did. The trip overall formed an incredible memory. (P3)

Some participants expressed their strong desire to wait until the end of the trip to share their experience to avoid over-sharing (or potentially bragging). This is in line with the previous research that emphasised the different impacts and roles of mobile technology on the travel experience (Kim & Fesenmaier, 2017). Furthermore, Tussyadiah and Fesenmaier (2009) argue the use of social media for post-experience sharing can provide 'new experiences' as a traveller can reinforce (and potentially reconstruct) the meaning of the trip. For example, participants expressed that post-trip experience-sharing not only allows them to thoughtfully curate the photos and/or videos but also allows them the opportunity to share meaningful things, as pointed out by P1:

> Scrolling through my phone that night brought me to the photos taken during the trekking. I realised I was smiling at my phone screen while I looked for the photos I wanted to share. Thoughtfully reviewing the photos allows me to savour those happy memories. As I do not normally post pictures on social media, I sent a few shots (which were meaningful for me, avoiding bragging) via WhatsApp to family members and friends who are actively interested in me and my life. (P1)

P1's reflection highlights the advantages of mobile technology to not only enhance connections with others but also bring joy to one's life.

4.3.2. Sense of community

Technology brings participants together after the trip ends. Through post-trip experience-sharing – reminiscing memories, exchanging stories, photos and/or videos – via the pre-formed WhatsApp group, the sense of connection continued beyond the trekking trip. Importantly, the pre-formed WhatsApp group were used to discuss not only the completed trekking trip but also future plans. Recognising this common connection between participants can help one to relate to each other and cultivate a sense of community. This notion of a sense of community was observed in the comment by P3:

> The next morning was more exciting. We were sharing our post-trek fatigue, soreness, and pain in the WhatsApp group. Some expressed how difficult it was to get up from bed, while others proudly said they did not have any soreness. Personal tips on recovery were exchanged. Some even propose the next trekking destination! At that moment, I realised one thing that brings people together is shared experiences. (P3)

However, mobile technology has affected the sense of community. Online platforms make it easier to keep in touch with like-minded people even if one is thousands of miles away, but the same mechanisms have decreased face-to-face interactions (Kim & Fesenmaier, 2017; Tussyadiah & Fesenmaier, 2009), exemplified by P2's comment:

> On the next day, I was filling water bottles in my office's kitchen, then I met one of the trekking members. Instead of having a conversation about the trekking, we exchanged 'stranger' smiles and walked away. At that moment, I felt weird because we were exchanging jokes and stories in the WhatsApp group, but we acted like strangers in real life. (P2)

P2's experience highlighted the role of mobile technology in building connections among group members, but the virtual camaraderie did not seem to translate into a face-to-face interaction.

4.3.3. Mixed feelings

Interestingly, most participants expressed strong negative emotional responses about sharing their trekking experience after the trip. Recalling the urge to share experiences during the trekking, P1 stated:

> There were times during the trek when we crossed a beautiful view, and I saw some people clicking pictures. I took my phone out to click a picture but felt as if I should be sharing it with people I know, as most of them were in a lockdown battling the virus [COVID-19]. It was like a pang of guilt that made me question if I should even be enjoying that moment. (P1)

Some participants were hesitant to share their trekking stories even after the trip ended. Instead of feeling happy to share the experience, they were wracked with guilt and shame about the normalcy of life while realising others were struggling through the pandemic, as stated by P4:

> Thinking about sharing the experience online brought me a sense of guilt and shame. It feels so wrong to share happy stories or moments in a pandemic when I know half a million people have died. Everything feels inappropriate to be celebrating during this pandemic. (P4)

Nevertheless, the fear of posting online was not only because of guilt and shame but mostly due to the fear of being shamed in the comments. Studies showed that the pandemic situation from COVID-19 has increased cyberbullying-related attacks (Jatmiko et al., 2020; Karmakar & Das, 2021). P1 expressed their sadness over the trends where people had abstained from posting online to not give the impression they were coming off as unaffected when there was so much suffering due to the pandemic. This is reflected in the comment below from P1:

> As I am away from family and friends, I feel the need to connect right now, but it's difficult when there is so much anger and hate being spread on social media. I know that to some people, it may seem insensitive or inappropriate to be posting about 'good things or moments' in life right now, but I questioned myself, why can't we use social media to look for signs of life? Thus, after so much consideration, I finally posted some photos on my Facebook accounts. Surprisingly, the feedback was positive. Several people commented, 'Finally, some good news from the other side of the world!', 'I am so happy to see you without masks, I pray we can be like that soon!' So, this ritual is essential to me now, not only for my saneness but hopefully to inspire others to try to find the good happening right now. (P1)

P1 emphasises the importance of utilising social media to establish connections with others and discover signs of life, specifically when experiencing isolation and difficulty during the pandemic. Social media can convey optimism and inspiration during difficult times, as demonstrated by the positive feedback received from P1's Facebook posts.

5. Discussion

This study aims to investigate the role of mobile technology in the NBT experience. To achieve this, we conducted a thematic analysis of data collected using the RCA of four participants. The analysis identified eight major themes that reflect how mobile technology impacts the NBT experience. In this discussion, we will examine these key findings and offer valuable insights for tourism practitioners and researchers alike.

This study demonstrated that mobile technology (usage in actual travel) might have implications for creating "both positive and negative experiences" of a travel experience (Park & Santos, 2017, p. 24). Thus, on the pretext of three stages of any travel (pre-visit, during-visit, and post-visit) (Ballantyne & Packer, 2011), the findings suggest multiple themes in each stage corresponding to the perception of mobile usage in an NBT experience (Fig. 4).

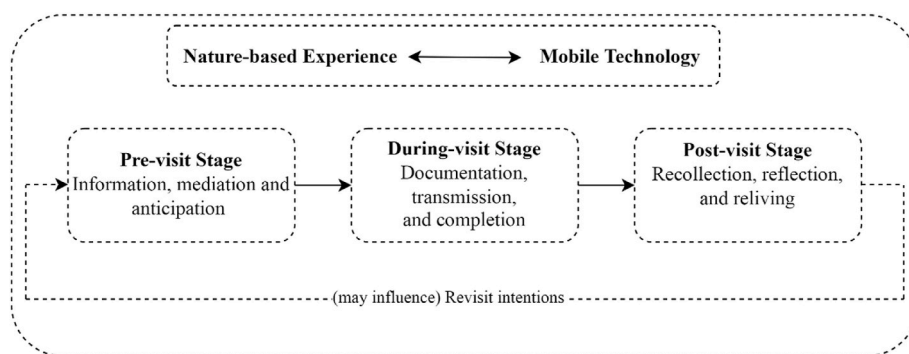In the pre-visit stage, mobile technology (along with other

Fig. 4. Role of mobile technology in the stages of nature-based experiences (informed by Park & Santos, 2017; authors).

technologically compatible devices) acts as a source of information, which mediates the anticipated experiences of the actual NBT experience. The findings, however, suggest that the role of mobile technology in the pre-visit stage differs across participants. Mobile technology was found by some participants to be helpful for gathering information and sharing it, while others felt that it disrupted their immersion experience. For example, the participant (P2) with high reliability on mobile technology relies on technology to gather and share information about the NBT experience. On the contrary, the participant (P3) who is interested in digital detox (Gretzel, 2014) wanted to avoid the interference of mobile technology in their NBT experience. Mobile technology can be viewed as intrusive by them, detracting from the immersive and spontaneous experience they desire. This approach of P3 in detaching themselves from mobile technology in an NBT experience is the opposite of "absence presence" (Gergen, 2002, p. 47), which is essential for P3, which illustrates their living in the present and experiencing nature in 'real-time' (Breves & Heber, 2020). Based on the findings, it is evident that in addition to information availability, the importance of mobile technology as an information source is affected by participants' motives.

During the NBT experience, some participants experienced difficulties detaching themselves from technology. This situation may be linked to the availability of information during the pre-visit stage when group members exchange information. While some participants think that planning ahead can be helpful, others believe it might prevent them from fully enjoying the experience, as unexpected moments might be missed. Furthermore, as information is shared on the WhatsApp group, it may be difficult for some participants not to receive excessive information on the trek. Research indicates that both the amount and quality of knowledge about a destination can influence the behavioural and psychological dimensions of the tourist experiences (Tussyadiah & Fesenmaier, 2009; Wang et al., 2011). As such, being able to find the middle ground between providing enough practical and helpful information while not diminishing the moments of serendipity is the key to planning a trip in the age of technology. The findings highlight the importance of understanding the diverse needs and preferences of travellers when developing mobile technology interventions for NBT.

In the during-visit stage, which is a "core experience" of any travel (Park & Santos, 2017, p. 25), mobile technology plays an essential role in the documentation and transmission of the NBT experience. The participants used mobile technology to document the experience using photography and videography along with other mobile-assisted (complemented) devices (for example, P1's usage of the Apple watch to track their health). Technology can improve travel and promote healthier habits, but it can also negatively affect group communication and cause individuals to lose touch with the present moment. This is especially true when individuals overuse technology, such as taking photos and videos during the trip. Not only can it disrupt group connections but also potentially cause conflicts or tension within the group. The constant sharing and tracking of information through mobile devices may lead to friction in group settings, as there is a potential that some individuals

may not be interested in constantly receiving updates. As such, during NBT experiences, individuals should be mindful of their technology usage and considerate of others' preferences and needs.

Despite the potential drawbacks, the capability to share and transmit experiences in real-time through mobile devices is crucial in the present connected world. This is exemplified by participant (P4), who shared their experience of "being there" with friends and family through mobile devices such as calls or social media. Mobile technology is utilised by P4 in (re)making and (co)constructing experience at the trekking site. In times of physical distancing and separation from loved ones due to the pandemic, the use of mobile technology to share experiences has become more important than ever. Due to the pandemic, many individuals experience physical distance from their loved ones. However, with the help of mobile technology, they can bridge the distance and share their NBT experiences with them, fostering a feeling of togetherness and happiness even when they are physically distant.

Mobile technology plays a vital role in the post-visit stage, principally in compiling recollections, reflection, and reliving of experiences. In particular, at the post-travel stage, mobile technologies, specifically the use of social media, are significant personal mediators in co-creating travel experiences (O'Dell & Billing, 2005; Tussyadiah & Fesenmaier, 2009). With the advancement of technology, sharing and revisiting the NBT experience is completely transformed. Though recollection can be a "unique personal experience" (Park & Santos, 2017, p. 25), this study showed that it could also be a group experience. The usage of mobile technology enhances this post-visit experience through in-person recalling, along with group sharing of pictures and videos of the trek. This can further lead to post-visit experience building, which can help in reliving the experiences through reflecting and seeing the photographs and videos on mobile. In this way, the NBT experience is more comprehensively understood, and a shared narrative can be created among group members. Looking back and reminiscing on memories with others can be a truly special and intimate experience, chiefly when those memories were shared with the people we are reflecting with. This not only helps participants to recall forgotten details but potentially gain fresh perspectives of experiences that were previously unconsidered (Tussyadiah & Fesenmaier, 2009). The findings of this study highlight the importance of group recollection in developing a more comprehensive and nuanced understanding of NBT experiences.

Nonetheless, this study raises a potential concern about the use of technology in the NBT post-visit stage, particularly how it might affect a sense of community. Literature suggests that mobile technologies, mainly sharing post-trip experiences, help maintain social connections, form relationships, and stay connected with others after the trip (Kim & Fesenmaier, 2017; Wang & Fesenmaier, 2004; White & White, 2007). Nevertheless, despite the advantages of mobile technologies, particularly in bridging the distance, nothing beats the warmth and authenticity of in-person interaction, emphasising the value of human interaction. As such, the overdependence on technology for communication not only can erode the sense of community as it leads to a lack of genuine human

connections (Kim & Fesenmaier, 2017; Tussyadiah & Fesenmaier, 2009). Instead, this situation can create a feeling of impersonality and distance, resulting in a difficult time forming a cohesive group identity. Consequently, the findings highlight the importance of maintaining an 'in-person sense of community' among NBT participants while utilising technology to keep connected, recognising the importance of a 'virtual community'.

Lastly, sharing travel experiences on social media can significantly impact the pre-visit stage of other travellers and affect the individual's intentions for revisiting. Sharing experiences on social media platforms can reach a vast audience and influence the pre-visit stage of other travellers, thereby contributing to the promotion of NBT. This can potentially significantly impact the tourism industry by attracting more visitors to NBT destinations, necessitating a careful balance to mitigate any unintended consequences such as over-tourism (Wengel et al., 2022). While this is true, study participants reported feeling guilty and fearful when posting positive experiences on social media during the pandemic. Guilt and shame were two negative self-conscious emotions triggered when travelling during the pandemic for themselves and other people (Cavalera, 2020; Sembada & Kalantari, 2021). Participants were concerned about being perceived as insensitive or inappropriate when sharing positive experiences online. Major social media platforms, including Twitter and Facebook, have been the location for online harassment (Karmakar & Das, 2021). This finding shows that besides the constant fear of catching the virus and putting others at risk, COVID-19 has ushered in a new era of fear. Before COVID-19, people shared their travel experiences proudly, wearing them like a badge of honour. Today, travelling for leisure while knowing that other parts of the world are still dealing with the surge of COVID-19 cases is definitely not easy and can even become a huge source of fear shaming. In other words, people who finally can travel may find themselves beset with self-travel shaming (guilt) and/or victims of travel shaming. The study shows that sharing positivity online during pandemics can be a powerful way to engender hope and optimism around the world.

6. Conclusion

This study examined the use of mobile technology in the NBT experiences of four researchers in New Zealand. This study was undertaken to augment the literature on mobile technology's role in different stages of the NBT experience. Methodologically, this study has demonstrated how employing RCA as a research method for this enquiry helps to manage some limitations of collaborative (and) qualitative research. For instance, working in a group through consensus helps question and limit recall bias, while analysing the experience in retrospect puts across every participant's observation in a more organic, less influenced fashion. Furthermore, this research method allowed us to understand the multi-perspective of the groups' behaviour in the participation of experience.

The study contributes to the calls by tourism scholars for the "use of new technology prior to, during, and after the NBT experience" (Albrecht, 2021a; Fredman & Margaryan, 2021, p. 20). The present study has contributed to the existing literature in three ways. Firstly, this study expands the literature by bridging mobile technology in NBT (and experiences) (Conti & Farsari, 2021). By explaining the usage of mobile technology in the sequential tourism experiences process of NBT, this study has demonstrated that the value of 'nature-based experience' is heterogeneous. This heterogeneity is mainly reflected in how different participants (who come from different backgrounds) use mobile technology both similarly and in diversity in NBT (Winter et al., 2019). These similarities and differences are akin to how mobile technology is used in other settings, such as everyday life. For example, younger age groups are more likely to be heavy users of mobile technology in their daily life and also adapt new mobile technology for various activities (Bolin & Westlund, 2008). Overall, the findings reinforce existing literature by demonstrating that technology has diversified the NBT

landscape, while emphasising that the utilization of technology in leisure activities continues to be influenced by the socio-demographic and travel characteristics of individuals (Adam, 2019; Wang et al., 2011).

The destinations and suppliers of tourism products also play an important role in how visitors use mobile technology at nature-based destinations. For instance, destinations that provide information about nature-based experiences (e.g., routes, wildlife) on their websites and Apps can influence the more technology-savvy visitors to utilise the information. Suppliers' provision of information about the nature-based sites reflects the sites' characteristics from an online perspective, which influences variations of mobile technology. Similarly, the site's physical characteristics are also linked to differences in how mobile technology was used. For example, some participants actively took pictures throughout the NBT as they appreciated the site's natural beauty. On the other hand, given the natural flora and fauna varieties, some participants appreciated nature with observation, touch and feel rather than using mobile technology to capture images.

Secondly, the study indicates that due to group members' differing motivations, the experiences can also vary. Additionally, this study has elaborated on the existing literature suggesting that a multi-stage tourism experience (Park & Santos, 2017) is more dynamic with mobile technology intervention in NBT. While there is a clear indication of the differences in motivations of mobile technology used in the NBT in this study, more detailed data would help better understand the motivations. Thirdly, this study also recognised the challenges in mobile technology usage in various stages in a non-homogeneous NBT experience (Fredman & Margaryan, 2021), which might hinder the NBT experience due to different expectations. Thus, some participants may feel disembodied and disengaged in an NBT experience (Tribe & Mkono, 2017) in the during-visit stage.

The study offers practical implications for trek/trail management organisations, local district boards/governments, and travellers/trekkers. Regarding trekking management organisations, an explicit detailing of the nature trails at the initial point can surely help the trekkers, especially if the trekking has multiple paths. This will help the travellers relieve the unnecessary stress due to disorientation. The same information board can also specify the mobile-network coverage area in the whole trail, especially marking the dead zone areas. Thus, pre-informed information can help travellers experience nature more closely without getting stressed about the network. Such information can also be included on the website and in brochures (if applicable), which will be used in the pre-visit information gathering. Lastly, the management can analyse visitors' feedback/user-generated content to manage the trekking (conditions) further. The provision of information in tourism suppliers' brochures and websites is an important practice to focus on sustainable tourism practices. For instance, within the last decade, there has been a strong focus on sustainable natural places, given the influx of visitors to these places. Tourism suppliers can provide detailed information about the site, including information about flora and fauna and expected conduct (e.g., the safety of visitors and looking after nature in those sites). Studies indicate that awareness can help in developing more sustainable and responsible behaviour by visitors (Caruana et al., 2014).

The major limitation of this paper is that only a single site was considered, which only reflected the topographical characteristics of a well-built New Zealand trail. Although, this limitation also presents an opportunity for further research to be conducted across various nature trails and tracks. Next, the network availability in unmanaged and remotely located trails might have a different implication on the stages of the NBT experience. Further, mobile technology and advanced camera and videography setting can also impact the experiences. Lastly, it is vital to note the limitations and challenges of our chosen method for this inquiry. The elements of retrospectivity present challenges such as a change in participants' attitudes, selective/partial analysis and inaccurate recollection of past events (Edwards, 2021; Snelgrove & Havitz, 2010) and the representation of a privileged population (Roy & Uekusa, 2020). Similarly, collaborative research presents some obstacles, such as

the risk of too many or overpowering voices (Lapadat, 2017). Moreover, synchronicity is another challenge to conducting such collaborative research in light of times when travel was/is restricted. While utilising these elements together through RCA does manage some of these challenges, it still presents challenges such as selective recollection of events, logistical challenges to collaborate, and overpowering voices (Tripathi et al., 2022). In the case of our study, at different stages of gathering information, analysing information and finalising the themes, we ensured rigour and consensus were practised to ensure the implications of these challenges were managed while rich, descriptive and verifiable findings were presented.

Despite the above-discussed limitations and contributions, this study calls for further research on the usage of mobile technology in NBT experiences. To start, a more nuanced understanding of the significance of NBT experiences for tourism suppliers will be valuable. Such research will identify the use of such information by different stakeholders. A comparison between a remote (multi-day) trail and this one-day well-managed trail can explain the more diverse management of mobile technology in NBT experiences. Research is desired to understand the repeat visit of the same trails in findings of the experiences with advanced mobile technology (e.g., drones). As this study had a heterogeneous group, an analysis to understand the behaviour and experiences of a homogenous group with (almost) similar motivations will add value. Such a study can focus on identifying specific characteristics that influence the low/high users of mobile technology in tourism generally and in NBT specifically. Further studies on how mobile technology mediates and affects a (non)interpreted NBT experience will be useful. Lastly, it is important to identify what information is essential in refining the existing NBT products and services and also developing new products/destinations.

CRediT authorship contribution statement

Rajesh Nautiyal: Conceptualization, Methodology, Investigation, Writing – original draft, Visualization. **Reni Polus:** Conceptualization, Methodology, Investigation, Writing – original draft, Visualization. **Animesh Tripathi:** Conceptualization, Methodology, Investigation, Writing – original draft, Visualization. **Ismail Shaheer:** Conceptualization, Methodology, Investigation, Writing – original draft, Visualization.

Declaration of Competing interest

The authors declare that there is no conflict of interest.
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Data availability

Data are available on request.

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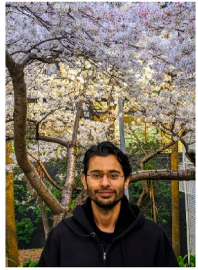
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