Chapter 10

Tech in Rec: Technology Use in Outdoor Recreation

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Abstract

Technology has always been a big part of human life. Since the time when we started using tools, we have ignited a fire which is today called technology. Technology is being used not only in the daily life, but also in the activities that individuals do in their leisure. One of the leisure activities that is popular and attractive to people of all ages is Outdoor Recreation activities. Outdoor recreation activities provide the participants thrill, risk, and adventure that they seek. However, the use of technology in outdoor recreation is a significant aspect as it provides safety to some point, navigation skills, comfort, and motivation. Therefore, the aim of this chapter is to investigate the technology use involved in the outdoor recreation activities. Thus, in this chapter the technology involved in outdoor recreational activities is discussed in different aspects as a motivator (social media and image), as a comfort (development in materials used), as a performance auditing device (wearable technology and tracking apps) and as simulation (virtual reality and augmented reality).

Introduction

Use of technology in sports has always presented a golden opportunity for the participants no matter if they were chasing performance or looking for a way to do exercise more comfortably. This can be considered in terms of professional sports as well as recreational sports. Of course, recreational activities can be categorized in different ways such as individual or group activities, therapeutic activities, workplace or campus activities, simple tourism acts or sports tourism activities, indoor or outdoor activities (Tribe, 2015). So, the use of technology in all these recreational activity types are different and getting more and more users all around the world.

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One example is the outdoor recreation which has become more and more popular among individuals since the COVID-19 which had a frustrating and harming impacts killing millions and affecting health, social dependence, and economics (Robets, 2020). Why outdoor activities became the salt of the earth is because it gave individuals the distance that they need and the physical activity that they crave for. Now, more and more people are still choosing to chase outdoor thrills through outdoor recreation opportunities provided. Naturally, this brings the subject to the concept of outdoor recreation.

Outdoor Recreation (OR) is both an old and a new concept when considered in different aspects. It is an old concept because people have been doing activities out in the nature for as long as they existed. However, it is a new concept due to the technological advances happening in the field. Of course, these technological advances have changed the face of the Outdoor Recreation for the people enjoying it. The changes occurred in many areas such as maps, GPS, wearable technology, digital apps that can be downloaded in smartphones, and the equipment. These advances brought about advantages for the people who participate in the activities carried out in nature and natural environments since the mother nature can make individuals face with many adversities as it is. Nevertheless, the right equipment and right technology use can turn these adventure seeking activities into a more achievable and enjoyable experience rather than just a risky movement.

The OR is also a vast area which includes many different recreational activities that can be carried out in land, air, and water. The land-based OR activities include but are not limited to the activities such as hiking, Nordic walking, trekking, camping, mountain biking, rock climbing, ice climbing, mountain climbing, trail running, mountaineering, orienteering, abseiling, horse riding, skiing, and snowboarding. On the other hand, air-based OR activities include powered/non-powered hang gliding, powered/non-powered paragliding, ballooning, kiteboarding (which is both air and water based), BASE jumping, bungee jumping, skydiving, and wingsuit flying. Finally, water based OR activities can include swimming, sailing, kayaking, scuba diving, fishing, windsurfing, white water rafting, jet skiing, parasailing, and stand-up paddle boarding which has recently been attracting many participants all around the world. All these activities have unique features which require unique equipment and unique technology. Therefore, in this chapter the technology involved in outdoor recreational activities will be discussed in different aspects as a motivator (social media and image), as a comfort (development in materials used), as a performance auditing device

(wearable technology and tracking apps) and as simulation (virtual reality and augmented reality).

Technology use in outdoor recreation as a motivator

Participating in outdoor recreation is associated with using adventure as a tool to overcome the socio-cultural barriers (Brymer & Schweitzer, 2013) and having illusion of cheating death (Schrader & Wann, 1999). As a motivator, participating in outdoor recreation and using the social media to advertise can be explained through motivation theories. Only the participation can be considered as the inner/internal motivation which includes thrill, fear, control, skills, achievement, physical fitness and risk. As internal/external motivation, nature, art of nature and spirituality can be both felt inside and be expressed on the social media. The external motivation here can be expressed as friends, image, escape and competing (Buckley, 2012) which are the popular phrases and hashtags used on the social media platforms by the users in order to describe their posts related to outdoors and nature. Also, gratification theory is also used by academics to explain the social media use and motivation. The theory approaches the social media use in ten ways which are social interaction through social media, seeking information, passing time on social media, looking for entertainment, using social media platforms for relaxing, expressing opinions, communicating, convenience utility, sharing information with others and getting knowledge about others (Whiting & Williams, 2013). From that perspective, the use of social media while in outdoors or while deciding about what to do in outdoors or where to go can be seen as a motivator.

Today, we are all engaging people through social media showing where we eat, where we drink, where we swim and what we do with our immediate circles. The number of users is getting higher everyday (Abi-Jaoude, Naylor, & Pignatiello, 2020). Generally, the research on social media use reveals negative effects on mental health, depression, anxiety, and body image (Beyens et.al., 2020; Kadam & Atre, 2020; Keles, McCrae & Grealish, 2020), and no doubt individuals need education in social media and technology use in our digital age (Valenzuela, 2020); however, not all the people use the social media in their disadvantage. There are some social media accounts providing information about the outdoor opportunities. Additionally, capturing an Instagrammable photo is a big motivation for outdoor lovers (Arts, Fischer, Duckett & van Der Wal, 2021). Flickr is another social media platform in which people share their photos in order to get followers. A study on Flickr users photo sharing situations in outdoor recreational areas such as parks revealed that these individuals not only posted themselves in the process,

but also overall shares included a sea of information related to the activities being carried out and different interests (Song, Richards & Tan, 2020). Another study on female representation in the outdoors on social media mentioned that being female and being in the outdoors do not necessarily match in the eyes of society. Outdoor activities are generally considered a male-dominant type of activities. However, the study revealed that some participants aimed to present a meticulous outdoor identity as an active participant and challenge the gendered and heteronormative perception of the society (Low, Miller, Doran & Hardwick, 2022). So, the social media is here used as a motivation to have a voice the field which is considered masculine.

On the other hand, individuals express their love of nature through social media. A study on social media, nature and life satisfaction showed interesting hashtags while posting photos of nature in the social media. These were as follows: nature, natural landscapes, tree, plant, water, forest, bird, highland river, sea, wilderness etc. (Chang et.al, 2020). Expressing how they are having fun and what outdoor activities mean to them can be both a motivation for the account owner and a motivation for the followers.

Another point where social media is a motivator is the interest groups on platforms such as Facebook, Instagram, Twitter, Flickr, YouTube, personal blogs, and websites. Today, the term "google it" is used by everyone to mean that search it on search engines such as Google, Opera and Firefox. Outdoor recreationists or enthusiasts can search anything they want to learn about using these search engines. They can also be a member of a group which is in their interest as well (see Figure 1).

Figure 1. Interest Groups on Social Media Platforms

To give an example, a hiking enthusiast can join a hiking group on one of the social media platforms, follow their trips and events, share their own knowledge about hiking, interact with people and make friends, or join them in a trip (see Figure 2.).

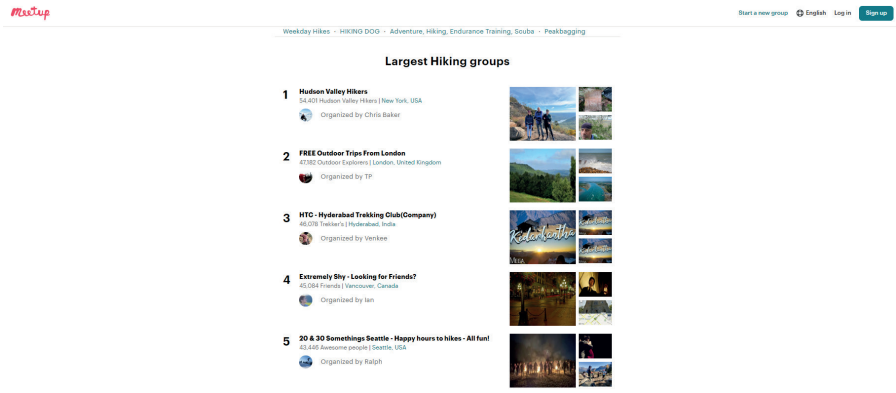

Figure 2. Hiking Blogs

A camper can learn how to tie knot by just writing "how to tie knot" on google and get information about different ways of tying a knot (see Figure 3).

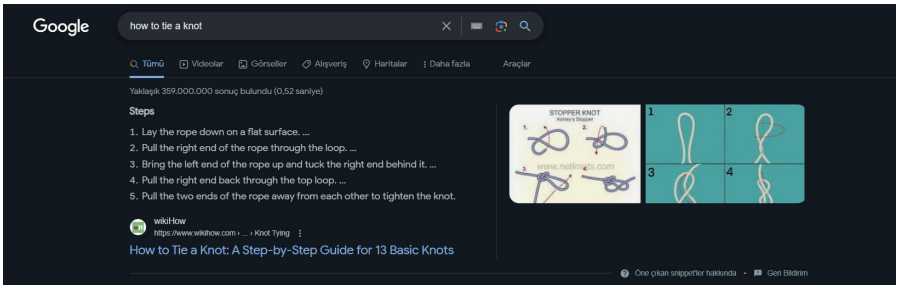

Figure 3. Searching about Information Related to Outdoor

Another outdoor recreationist can share their experience about an activity they do and inform other about how to get to the place, what to do their, how much they should spend, and what equipment they should have while doing this particular activity (see Figure 4).

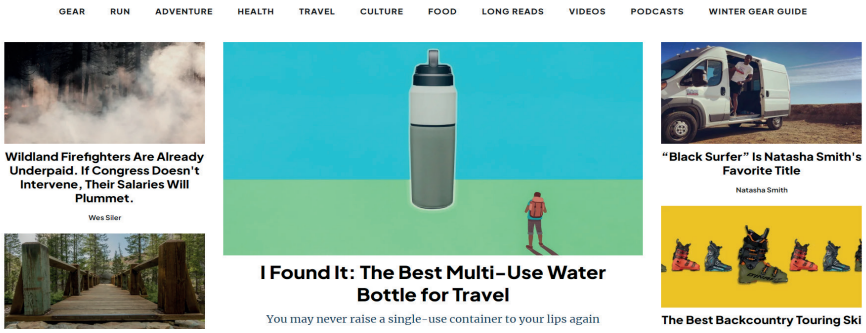

Figure 4. Outdoor Experience Sharing Websites

If they are not familiar with the environment, they can search for the outdoor activities that can be done in the district (see Figure 5).

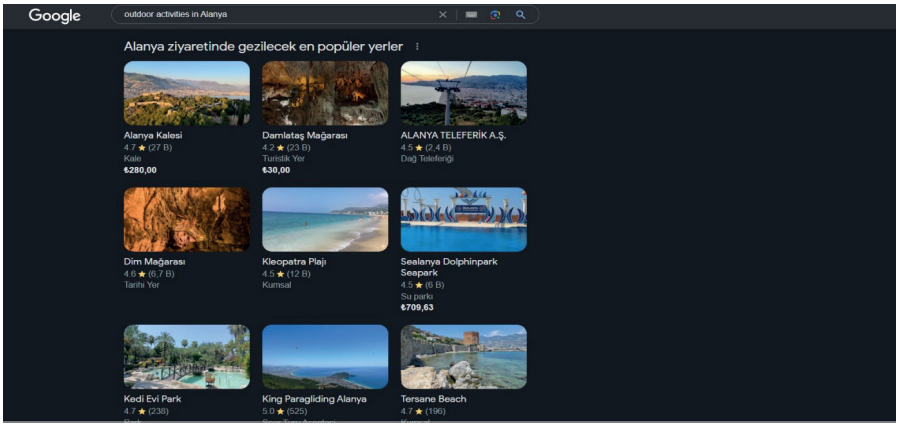

Figure 5. A Google Search about Outdoor Activities in a Particular Area

As can be seen, when used in advantage, social media is not about creating depression and anxiety, but about providing and receiving information about the subject of interest. These positive sides of technology use in outdoor is the motivating factor for the individuals participating or considering participating in the outdoor activities.

Technology use in outdoor recreation as a comfort

As mentioned before, the use of technology in outdoors is not new and can be very crucial to the lives of humans. Let's think about the first humans on earth, they built tools to survive and use those tools to their advantage to create today's society. Our ancestors had curiosity and exploration, and

we have it in our DNAs. When considering technology, one should not only think about the digital technology but also should think about materials evolution throughout the years. For example, as an outdoor hotel, tents have been providing campers who are sensitive to nature (Doğantan, Gülenç & Kozak, 2017) to have a vacation in different locations. Whereas at first, individuals used to utilize canvas tents (Harmon, 2001) which consist of guy lines, tent fabric, metal poles and stakes, today tents are much more efficient to be used in any weather conditions. The development of the ticking (the fabric used to make tents) allowed campers to camp under the rain, in very cold environments, or under the burning sun (see Figure 6). Also, today the technological advances allow campers to see their ways in the dark since they can use flashlights. Sleeping bags, today, can be used in -40^{o}C which make it easier for campers to have a good night sleep under the snow. Having a fire lit in the nature used to be problematic; however, today campers can use small propane cylinders not to harm nature in any way possible.

Figure 6. Contemporary camping materials

Another way to consider technology use in outdoor recreation as a comfort is the materials that are worn while in the natural environment. As the technology reached a certain level, the materials individuals wear became more and more comfortable to the users liking. In addition, research has been carried out to develop the materials meeting the expectations such as optimal skin temperature, comfort during activity, appearance and color harmony, and aesthetics (Park, Park, Lee & Ra, 2001). Among the outdoor recreationists the keyword for the outdoor wear is "functional" (Je, 2012). The outdoor wear should satisfy the users in the harsh conditions in the nature or the natural environments. Whereas there is a traditional approach to development of outdoor wear, there are ideas about turning wearable products (such as jackets) into tents in order to let the users one less item while

going camping (Wang, 2014). A study on outdoor wear revealed that for the extreme outdoor recreational activities, individuals prefer an ergonomic pattern of design for easy activity as well as functional materials that can adapt to the air conditions. On the other hand, individuals who participate in outdoor activities such as trekking and hiking, the important thing is portability and easy storage (Yoon & Roh, 2021). What is also significant for the users is moisture absorption and fabric breathability (Lee, 2010). Zhang et.al. (2022) carried out a study on perfecting running, hiking, trekking and similar outdoor footwear inspired by ostrich foot which enhances the comfort and performance of the participants. The results showed that the enhancements in the bionic cushioning unit in the heel area provided positive results for the users. However, a study carried out on the climbers revealed opposing views in terms of technological developments in the area of climbing (Barratt, 2011). Some climbers thought that the technological advances in both wears and climbing equipment has made the experience of climbing safer and helped improve climbing experience, whereas the others thought that individuals climbing became more dependent on the technology and were losing their skills. All in all, individuals today use the technological advancements to their advantage in the outdoor recreation activities to achieve comfort while doing challenging activities.

Technology use in outdoor recreation as a performance auditing device

The technology can be used in the outdoor recreation activities for auditing the performance as well. Many smart devices have been developed with which individuals engaging in outdoor recreation activities can use to measure the duration of activity, to see calories burnt, to track outdoor workouts (GPS), to monitor their heart rate, to count their steps, to check their blood oxygen levels and blood pressure, to have an altimeter and compass. Among these smart devices, there are watches, headlamps, cameras, belts, bracelets, and glasses. In the context of outdoor recreation, all these devices provide different opportunities. Individuals interested in outdoor recreation can download applications on most of these devices to audit the aforementioned parameters. To begin with, there are some applications which help the users to track their outdoor workouts. Some of those are Wikiloc, Map My Hike, AllTrails, Komoot, Hiking Project, Gaia GPS, Green Tracks, A-GPS Tracker, Strava and AlpineQuest GPS Hiking Lite. These apps include services such as routes for mountain bike trails, hiking trails, road bike trails, bicycle tour trails, off road trails, alpine climbing trails, trail running trails, walking trails, backcountry skiing trails, road motorbike trails, dual-sport motorcycle trails, kayak/canoe trails, snowshoe trails, quad trails, car trails, sailboat trails, cross country ski trails, and horseback riding trails (see Figure 7 and Figure 8).

Figure 7. Tracker App Wikiloc

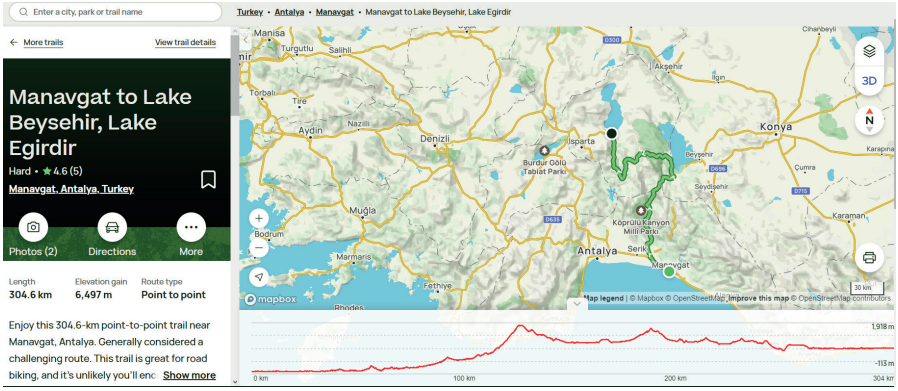

Figure 8. Trail Map Example on AllTrails

On these apps, the users can share their own routes as well as follow the routes explored by others (see Figure 9 and Figure 10).

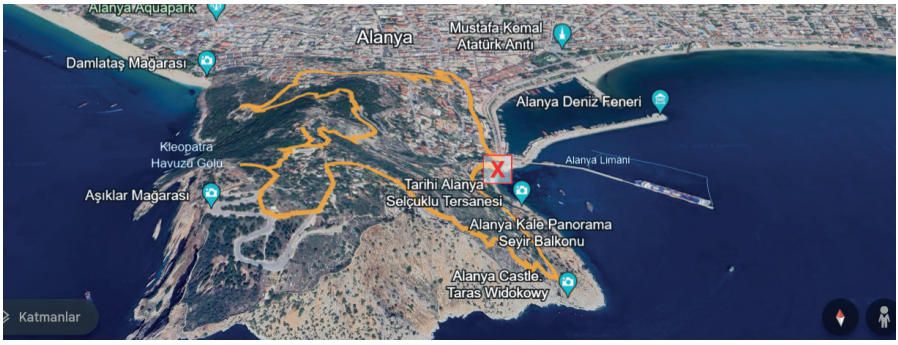

Figure 9. The Route

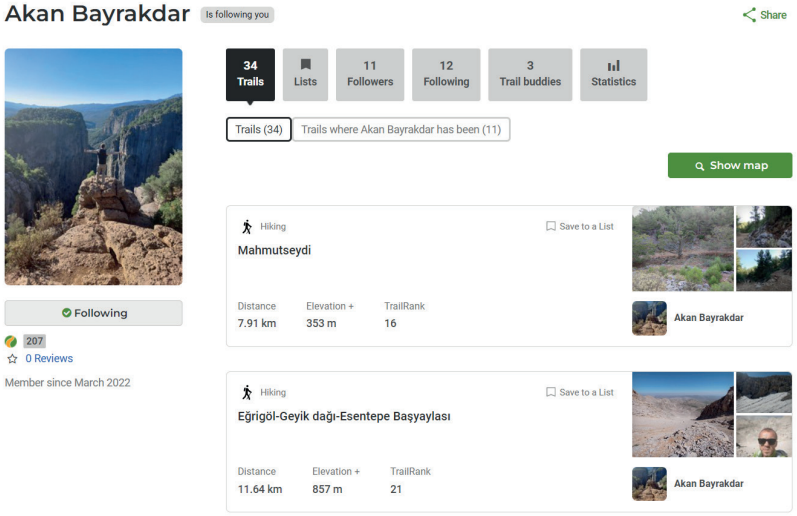

Figure 10. Following Trails of Others

There are other devices that recreational outdoor participants use. For example, recreational cyclists and runners use smart watches to assess their development during the exercise. As outdoor activities, running and cycling are considered as endurance requiring sports. So to follow and trying to enhance performance, recreational runners and cyclists use smart watches. In a study carried out on recreational and competitive runners, it was found that these individuals generally use more than one type of smart devices. The most used type of smart devices is smart sport watches. Also, recreational runners use their smart phones and apps as well as wristbands more commonly than competitive runners (Clermont, Duffett-Leger, Hettinga & Ferber, 2020). In the literature, it is also claimed that most runners consider these devices as virtual coaches that assist them during the activity (Scataglini, Cools, Neyrinck & Verwulgen, 2021). In another study, it was stated that almost all app and device using runners monitored their distance, time, and speed during running (Jansen, Walravens, Thibaut & Scheerder, 2020). As for the recreational mountain bikers, new research proposes ideas related to risk and injury prevention (Langer, Dietz & Butz, 2021); therefore, in the near future, devices and apps can be developed to prevent the participants from getting injured or choose the risk they want to take. Some research, on the other hand, approach the subject from another angle. Wu et.al (2020), proposed to develop a new app for the cyclists to assess all the data of the individuals all day including during exercise and create new exercise prescriptions (see Figure 11).

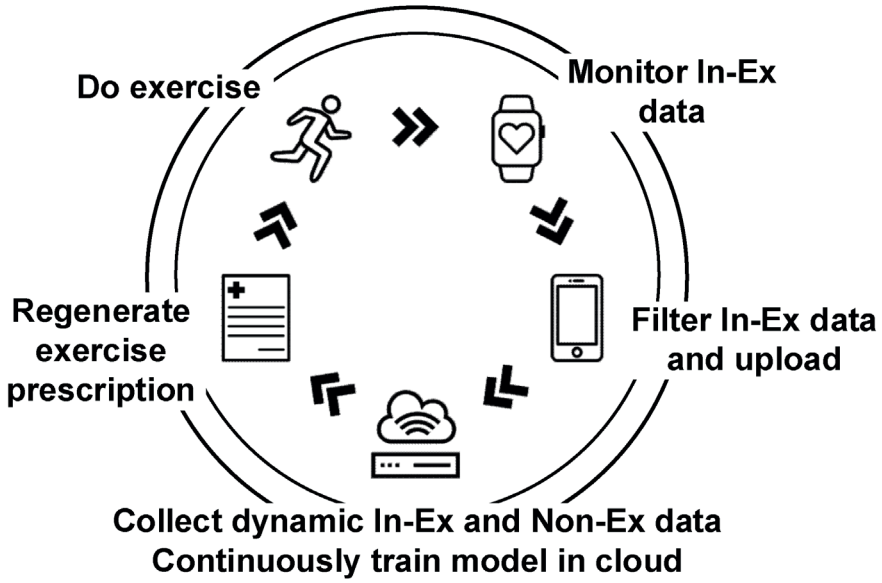

Figure 11. The various parts of the closed loop containing the prediction model

Technology use in outdoor recreation as a simulation

The technological developments can be used as a simulation in the outdoor recreation. Virtual reality (VR) has become more and more popular throughout the years, and individuals became addicted to the experience of the VR. The ancestors of the contemporary VR are Sensorama which is the Morton Heilig's system where users could ride a motorbike in New York and Flight Simulators originally designed for military services (Gigante, 1993). Flight simulators allowed scientist to understand the technical requirements underlying VR. Today VR is in our living rooms. Individuals all around the world, horror games, war games, play tennis or do archery and even dance on the same day thanks to the VR googles. In the literature, it is stated that virtual reality can initially contribute to the individuals who cannot participate in the outdoor recreational activities directly (Winter, Selin, Cerveny & Bricker, 2019). VR technology is stated to facilitate a reconnection with the natural recreational environment (Scarles et.al., 2020). Also, there are studies indicating that VR technology can be as effective as actual nature in promoting ecological behavior meaning individuals using VR to experience nature and outdoor also gain awareness, and act on it (Deringer & Hanley, 2021). In another study, the researchers found that six minutes of nature exposure in mobile VR headsets produced similar effects as 6 min of outdoor nature exposure (Browning et.al., 2020).

VR can also be used in the outdoor education. As it was used in flight experiences, VR use in outdoor education can help the participants get used to the threats and opportunities in the outdoor environment. One example is the study carried out the measure the leadership development of students taking the outdoor education lessons. The study revealed that adding virtual reality to exploratory education proved that the experience allowed students to generate learning attitudes and change their behavior to the expected level more easily (Lin, Wang, Kuo & Luo, 2017). When the outdoor education is considered, another significant thing to consider is Mobile Augmented Reality (MAR) which utilize mobile devices to deliver digital learning resources that are triggered by GPS location by QR codes (Ryokai & Agogino, 2013). The literature indicates that MAR use for outdoor education is burden-free and greatly needful and helpful tool for education (Kuo, Lin, Shen & Jeng, 2004; Cuthbertson, Socha & Potter, 2004). However, it is suggested to be used with the traditional education methods (Joan, 2015).

Conclusion

As humans, we are very lucky to have seen the technology enhancing to the level it is now. The outdoor recreationists are even luckier to have the devices and applications to be used during their activities. This chapter included developed and developing technologies that are used and can be used in the outdoor environments and/or in the environments which stimulate the participants' brains to give the same reaction as outdoor experiences. Technology use in outdoor recreation has been discussed under four terms as motivator, comfort, performance auditing and simulation. These are each and all reasons why individuals choose to use and make use of the technology involved in outdoor recreation. Nevertheless, whatever the reason, individuals should continue to use the technology in order to further develop it with their feedback and to create a better environmentally friendly next generation. When more individuals use these devices and apps, more individuals will be out in the nature which can raise awareness related to nature and natural environments to be taught to the next generation. Since the climate change and air, water and environmental pollution have become a threat to all of us, nature-conscious generations can take their step more seriously and carefully. Also, making use of these technologies, individuals can live their lives more healthily which reduces the time and money spent on the public health. Lastly, individuals can enjoy the views of nature and appreciate it more when they continue to participate in the outdoor recreation activities.

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