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SOCIAL MEDIA AS A LEARNING RESOURCE FOR OUTDOOR ENTHUSIASTS: A CANADIAN PERSPECTIVE

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LES RÉSEAUX SOCIAUX COMME OUTIL D'APPRENTISSAGE POUR LES PRATIQUANTS D'ACTIVITÉS DE PLEIN AIR CANADIENS: UNE PERSPECTIVE CANADIENNE

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DEDICATION

To my grandparents who taught me how to identify
wildflowers and look up at the sky

Table of Contents

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

Outdoor enthusiasts can acquire knowledge and skills about their activities in different ways, one of these being social media. Nonetheless, current scientific literature does not allow us to understand how outdoor enthusiasts currently use social media to learn about their activities. This exploratory research, based on a mixed methods design aims to better understand how Canadian outdoor enthusiasts (COE) use social media to learn about skills relating to their outdoor activities. This study examined how 368 COE use social media to learn about their activities. Khi-square tests and t-tests were applied to analyze differences between participants' answers and individual characteristics. Results suggest that COE do indeed use social media as a learning resource. Qualitative data originating from the same survey suggests that COE also use social media to get ideas and inspiration as well as to connect with other outdoor enthusiasts.

Key words: outdoor activities; social media; outdoor enthusiasts; informal learning; skills

RÉSUMÉ

Les pratiquants d'activités de plein air peuvent acquérir des connaissances et des compétences sur leurs activités de différentes manières, l'une d'entre elles étant à travers les réseaux sociaux. Néanmoins, la littérature scientifique actuelle ne nous permet pas de comprendre comment les pratiquants d'activités de plein air utilisent actuellement les réseaux sociaux pour s'informer sur leurs activités. Cette recherche exploratoire, basée sur des méthodes mixtes, vise à mieux comprendre comment les pratiquants canadiens d'activités de plein air (PAPC) utilisent les réseaux sociaux pour acquérir des compétences liées à leurs activités de plein air. Cette étude a examiné comment 368 PAPC utilisent les réseaux sociaux pour s'informer sur leurs activités. Des tests khi-carré et des tests t ont été appliqués pour analyser les différences entre les réponses des participants et les caractéristiques individuelles. Les résultats suggèrent que les PAPC utilisent effectivement les médias sociaux pour s'informer sur leurs activités. Les données qualitatives issues du même questionnaire suggèrent que les PAPC utilisent également les réseaux sociaux pour s'inspirer ainsi que pour entrer en contact avec d'autres passionnés d'activités de plein air.

Mots-clés : Plein air; réseaux sociaux; pratiquants d'activités de plein air; apprentissage informel; habiletés

INTRODUCTION

Since the birth and development of the Romanticism movement in Europe during the eighteenth and nineteenth centuries, the outdoors has been considered a place to "disconnect" from modern society (Nash, 2014; Payne & Wattchow, 2008). Today, it is very difficult to “disconnect” completely from modern society while being outdoors, as technology, including cellphones, is increasingly present in all spheres of our lives and now often part of our outdoor experiences (Bolliger et al., 2021). On the one hand, technological devices are used during outdoor activities for safety and informational purposes, for example, using the integrated GPS or checking the weather among other utilities (Hills, 2019). Some research investigates the various advantages and disadvantages of integrating technology for such practical purposes to outdoor experiences (Cuthbertson et al., 2004; Hills, 2019; Shultis, 2012a; van Kraalingen, 2021). On the other hand, these devices are also used to connect with other outdoor enthusiasts and share pictures about outdoor experiences (Arts, 2021). These virtual connections most often take place on social media platforms such as Facebook or Instagram (Arts, 2021). Outdoor enthusiasts can not only use these platforms to create a “sense of virtual community” (Kotut et al., 2020), but they can also acquire knowledge and information about their outdoor activities (Innocenti et al., 2022).

Although there is a plethora of outdoor virtual communities and countless posts about the outdoors on social media, very little research investigates how outdoor enthusiasts use social media as a learning resource. This research aims to fill this gap in the literature and serve as a building block for future research on how outdoor enthusiasts learn about the outdoors through social media.

My interest in research concerning the use of social media as a learning resource for outdoor enthusiasts stems from my profession as an outdoor guide, my interest in outdoor education, and my personal use of social media. After completing a degree in Outdoor Leadership at Université du Québec à Chicoutimi where I gained expertise in numerous outdoor disciplines, I occupied several jobs in the outdoor education sector. Notably, I worked for l’Unité de sport et de loisir de la capitale nationale (ULSCN) to develop an official outdoor education curriculum for high schools in Quebec. I also worked as the coordinator for Mount Royal Ski School where I oversaw multiple tasks such as refining the curriculum being taught. My occupation as a professional outdoor guide specializing in outdoor education informs this research.

During my degree and engagement in outdoor activities, I have consistently harbored a keen interest in social media. In addition, I have also been an amateur outdoor photographer and videographer for many years and enjoy capturing images of my adventures. These hobbies have led me to share images, posts, and

videos on various social media platforms. I have also used social media on numerous occasions to learn about outdoor activities, such as asking questions on *Facebook* groups and watching videos on *YouTube* to plan extensive expeditions. While looking up information myself and meeting other outdoor enthusiasts during various expeditions, I noticed that many outdoor enthusiasts use social media to learn about the outdoors and plan their outings and expeditions in nature. My research is also inspired by the Master's research of my older sister Emma June Huebner on museum education through social media (Huebner, Emma 2022). My participation in this study and my personal use of social media to plan my outdoor adventures inspired me to pursue research on the use of social media as a learning resource for outdoor enthusiasts.

CHAPTER 1
PROBLEM

This chapter details two arguments that support the rationale behind this research project. First, it explains how the increase in the practice of outdoor activities in Canada has subsequently created an increase in the need to develop skills and competencies relating to these activities. Second, it demonstrates how there are different ways to acquire knowledge about outdoor activities, with a focus on social media. Then, this chapter also announces the purpose, the research question, and the main objectives of this study.

1.1 The increase in the practice of outdoor activities in Canada has subsequently created an increase in the need to develop skills and competencies relating to these activities

1.1.1 The increase in the practice of outdoor activities in Canada

Outdoor activities which refer to human-powered activities that take place outdoors in a natural setting (Miles & Priest, 1999) are very popular throughout Canada. For the last 10 years, the Canadian Household and Environment survey has reported that over 70% of households had at least one person participating in outdoor activities close to home (Statistics Canada, 2015). The number of Canadians practicing outdoor activities seems to be on the rise, as the most recent Canadian Household and Environment survey shows that 77% of households have at least one person participating in outdoor activities close to home, up from 72% reported in 2016 (Statistics Canada, 2021). This increase in the practice of outdoor activities can also be noted in Parks Canada visitor attendance statistics: between 2019 to 2020 attendance grew by 2% (Government of Canada, 2020).

Moreover, this increase is particularly observed in certain provinces, such as Quebec for which there are numerous studies. According to the Réseau plein air Québec [RPAQ], in 2023, 75% of Quebecers practice outdoor activities (Réseau de plein air Québec, 2023), whereas according to Lavigne, only 32% of Quebecers practiced outdoor activities in 2004 (Lavigne, 2007). With 91% of its residents participating in outdoor recreation or wilderness activities, the province of British Columbia has the highest percentage of Canadian outdoor enthusiasts (Destination BC, 2014).

This increase in the practice of outdoor activities has seen a noticeable rise since the start of the COVID-19 pandemic. A survey conducted by National Léger found that since the beginning of the pandemic, 85% of Canadians “have been exploring trails” (Trans Canada Trail, 2021). Moreover, this same survey found that 40% of Canadians have increased their trail usage since 2020 (Trans Canada Trail, 2021).

Furthermore, this exponential interest in the practice of outdoor activities can also be observed on a global scale, as the adventure tourism market is expected to reach 1.16 trillion by 2028, which constitutes a 20% increase since 2020 (Adventure Travel Trade Association, 2022).

This increase in the practice of outdoor activities in Canada has also led to an increase in accidents and injuries during these activities (Canadian Institute for Health Information, 2021; Castonguay, 2016). Consequently, it is important to understand what causes these accidents to occur.

1.1.2 To reduce the risk of injuries, there is a need to increase participants' knowledge about outdoor activities

Because the popularity of outdoor activities is growing in Canada, so is the need to develop knowledge, skills and competencies relating to these activities. Outdoor activities often require a high level of skills and abilities (Palmer, 2004; Thomas, 2005). The development of hard skills, that is to say, technical skills, relating to outdoor activities allows outdoor enthusiasts to practice their activities in a safer manner (Henderson & Potter, 2001).

One can justify the importance of developing skills relevant to outdoor activities by pointing to the rising incidence of accidents among outdoor enthusiasts (Castonguay, 2016; Cockrell & LaFollette, 1985; Priest, 1987; Réseau de plein air Québec, 2023). Tranquard & Bourbeau explain that as the popularity of outdoor activities is growing so is "the frequency with which [outdoor enthusiasts] are confronted with situations of precariousness and sometimes very advanced physical and psychological commitment is [also] increasing" (2014, p. 99). Meier identifies three main causal factors of accidents occurring in the context of outdoor activities (Meier, 1984):

1. Unsafe conditions (e.g., Moving water, loose rock)

2. Unsafe acts (e.g., Skiing in a high-risk avalanche zone, canoeing without a life jacket on)

3. Judgement Errors (e.g., Fatigue, distraction)

Such causal factors behind accidents occurring in the context of outdoor activities can notably be mitigated through proper education (Darby, 2020; McCammon, 2000; Meier, 1984; Salmon et al., 2010). Priest argues that outdoor enthusiasts should rely on their competencies to overcome the risks faced during the practice of their activities (Priest, 1992). For instance, Priest gives the example of canoeing where he explains that

the risk of capsizing is directly congruent to the outdoor enthusiast's level of ability to manoeuvre the craft adequately (Priest, 1992). He notes that "without appropriate knowledge of [technical skills], [outdoor enthusiasts] may find conducting adventure experiences to be dangerous" (Priest & Gass, 2018, p. 112). Because skills are used to overcome risks encountered during outdoor activities, it is important for outdoor enthusiasts to develop these types of skills in order to reduce the risk of accidents and injuries occurring during the practice of outdoor activities.

The increase in the practice of outdoor activities has led to more accidents, it is therefore important for outdoor enthusiasts to be better prepared and acquire more knowledge about their activities. Hence, it is pertinent to examine various learning opportunities related to outdoor activities.

1.2 Different ways to learn about outdoor activities

There are many avenues by which Canadian outdoor enthusiasts can acquire information about their activities. The following section elaborates four different ways of learning and acquiring knowledge about outdoor activities: 1) official provincial and federal outdoor training organizations, 2) learning about outdoor activities through outdoor education programs, centers, and clubs, 3) learning about outdoor activities through adventure tourism activities, and 4) learning about outdoor activities through informal learning.

1.2.1 Official provincial and federal outdoor training organizations

There are numerous ways in which Canadian outdoor enthusiasts can acquire information about their activities. This includes taking part in outdoor courses in order to earn certificates. Outdoor training organizations in Canada can either be privately run and operated or can be mandated by the government bodies, both national and provincial (Bergeron et al., 2022; Jensen & Guthrie, 2006; Outdoor Council of Canada, 2023).

First, national organizations offer certifications and courses that allow outdoor enthusiasts to acquire skills relating to specific outdoor disciplines, for example, Paddle Canada, Leave no Trace Canada and the Canadian Avalanche Association. Some of these organizations offer programs only destined for outdoor leaders, while other organizations offer courses for both outdoor leaders and outdoor enthusiasts. For instance, as shown on the chart below, the Canadian Avalanche Association offers courses destined for "recreationists" and other courses for outdoor professionals (Canadian Avalanche Association, 2023).

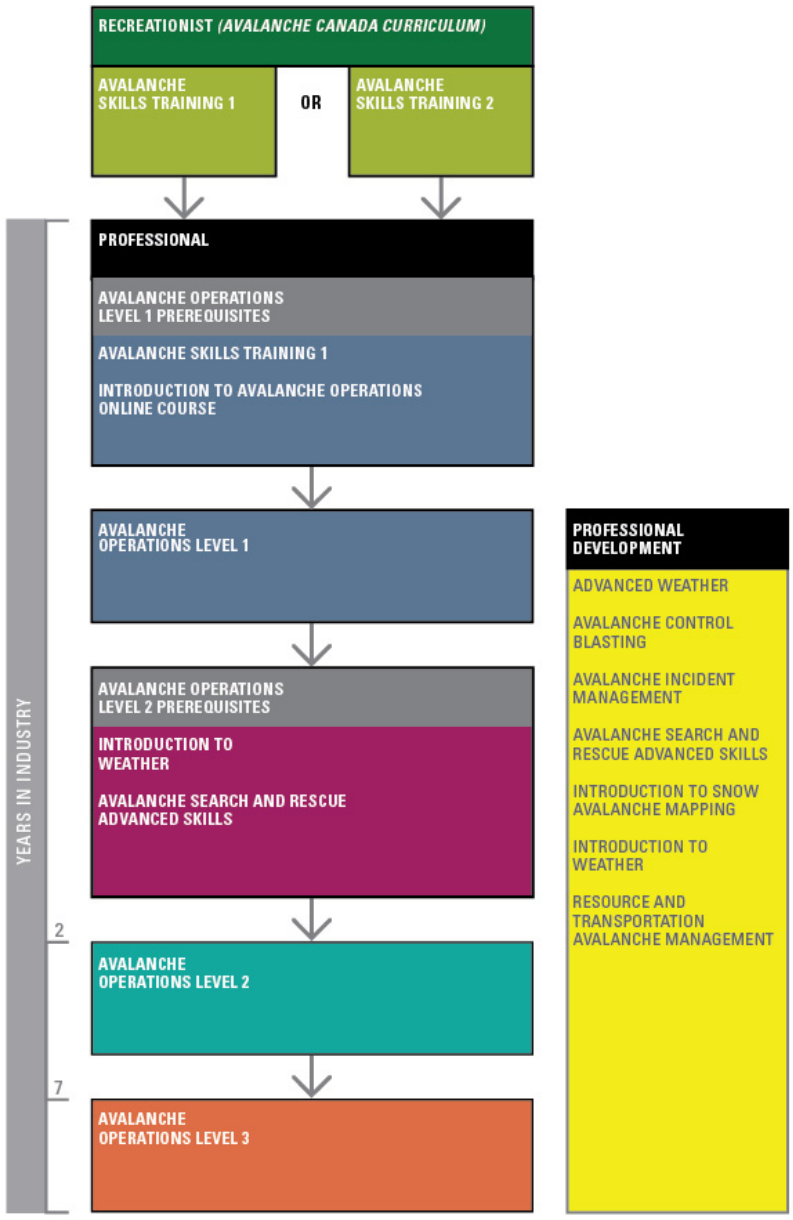

Figure 1. Canadian Avalanche Association Training Flowchart

Second, there are provincial organizations that offer similar courses to national outdoor organizations. For instance, Canot Kayak Québec (CKQ), Hike Nova Scotia and Paddle Manitoba. Bergeron *& al.* (2022) identify the three main objectives of Quebec outdoor provincial organizations, also known as outdoor federations: aid in the development of outdoor activities, help protect the practice and access to territories and help promote the autonomous and supervised practice of their activities (Bergeron et al., 2022).

1.2.2 Learning about outdoor activities through outdoor education programs, centers, clubs, and summer camps

Outdoor enthusiasts can also acquire knowledge about outdoor activities by participating in various outdoor programs as a child or teenager, such as attending summer camps (Bialeschki, 2015; Mercure, 2022). As explained by Henderson & Potter, many of Canada's numerous summer camps offer adventure activities such as canoeing, sailing, canoeing and hiking (2001). Another way children and teenagers acquire skills in outdoor activities is through the integration of outdoor activities in physical education courses at school (Asfeldt et al., 2021). Blatt & Patrick (2014) explain how outdoor experiences in nature as a child with a significant adult shape future outdoor interactions . Children and teenagers can also learn about the outdoors through organizations such as Scouts Canada (Gravelle & Deschênes, 2004; Mercure, 2022).

Children, teenagers, and adults can also acquire skills relating to outdoor activities by attending outdoor education programs such as Outward Bound courses. Outward Bound is an outdoor education and leadership organization that offers a variety of multi-day outdoor expeditions and experiences (Burton, 1981). A study done by McKenzie demonstrated that one of the students' main motivations for participating in an Outward Bound course was to learn new technical skills (McKenzie, 2003). O'Farrell & Liu (2020) also posit that outdoor education centers provide learning opportunities for people to acquire skills in outdoor activities. Furthermore, outdoor enthusiasts can acquire knowledge and skills about their activities through various outdoor clubs (Jensen & Guthrie, 2006; Kvasnička, 2007; Watters, 1985).

1.2.3 Learning about outdoor activities through adventure tourism activities

Children, teenagers, and adults can also learn about outdoor activities through adventure tourism or nature tourism activities. On one hand, adventure tourism can be defined as a trip that includes "at least two of the following three elements: physical activity, natural environment and cultural immersion" (Huddart et al., 2020, p. 1). On the other hand, nature tourism has more of a contemplative focus and is focused on "seeing" rather than "doing" (Huddart et al., 2020). Adventure tourism experiences are most often commercialized activities in natural contexts and can include activities such as guided hiking or kayaking trips. Although in commercialized adventure tourism activities outdoor enthusiasts rely on the skills and knowledge of their guides (Morgan & Fluker, 2003), outdoor enthusiasts often greatly develop their skills in these commercialized activities (Beedie & Hudson, 2003). This desire to acquire skills during adventure tourism activities is particularly observed in more advanced outdoor enthusiasts who are "more concerned with the improvement of their performance" in the outdoor activity (Pomfret, 2006, p. 119).

1.2.4 Learning about outdoor activities through informal learning

Finally, outdoor enthusiasts can acquire knowledge about their activities through informal learning. It is very important to investigate how outdoor enthusiasts learn about their activities in this way because this type of learning is increasingly a part of knowledge acquisition and the modern education landscape (Siemens, 2004).

As stated by Castilho & Gomez, "the relationship between individuals and nature should not be considered strictly formal" (Castilho, 2019, p. 371). Jeffs & Ord (2017) argue in their book : *Rethinking outdoor, experiential and information education: Beyond the confines* that informal learning can enhance outdoor education while insisting that research on informal outdoor education is lacking and needs to be further investigated. To this day, there has been limited research that explores how informal learning is integrated into outdoor education settings. For instance, Hovardas argues that primary teachers who incorporate outdoor education into their curriculum, often rely on their peers to acquire information (Hovardas, 2016).

The 2012 Canadian nature survey examined how Canadians acquired information about nature. Although this report investigates how Canadians acquire information about nature in a general sense, this report includes outdoor activities as being a part of nature-based activities (Federal and Provincial Territorial Governments of Canada, 2014). According to this survey, 64% of Canadians practice outdoor activities, that can be called "nature-based" called (Federal and Provincial Territorial Governments of Canada, 2014) and the report concluded that the three informal ways that Canadians most frequently used to obtain information about nature are: "watching visual media" (63%), followed by "reading publications" (62%) and "conversation" (40%) (Federal and Provincial Territorial Governments of Canada, 2014, p. 62).

Options Listed in Survey	Canadian Adults	
	Population Estimate	Percent
Watch visual media	16,757,641	63%
Read publications	16,422,926	62%
In conversation	10,607,372	40%
Through personal experience	8,641,448	33%
Read informal communications	5,865,512	22%
Listen to audio media	3,674,698	14%
Educational opportunities	1,422,049	5%
Other	351,664	1%

Figure 2. Ways Canadians most frequently obtain information about nature (Federal and Provincial Territorial Governments of Canada, 2014)

One of the most widespread ways of informal learning in our modern-day society occurs through social media (Guerin et al., 2020). As explained by Reed & al. (2022), it is of critical importance to understand the role of networked spaces in outdoor education and learning.

1.3 Learning about outdoor activities through social media

Learning about outdoor activities through social media is also considered a way of informal learning (Gilbertson et al., 2022). The following section is divided into three sub-sections. The first subsection explains how social media is used in general. The second subsection focuses on how social media is used to learn. Finally, the third section considers how social media might be used as a as a learning resource for outdoor enthusiasts.

1.3.1 Social media use in Canada

Social media is widely used by most Canadians. As highlighted in the 2018 Canadian Internet Use Survey, today social media is "prevalent across all age groups, regularly used by about 9 in 10 Canadians aged 15 to 34 […], by about 8 in 10 of those aged 35 to 49 […] 6 in 10 of those aged 50 to 64 and about 1 in 3 seniors" (Schimmele et al., 2021). Social media is a communication mechanism that lets users connect not only with their friends and family but also with individuals from all around the world (Whiting & Williams, 2013). Whiting & al. identify seven main reasons why people use social media: 1) social interaction, 2) information seeking, 3) pass time, 4) entertainment, 5) relaxation, 6) communicatory utility and 7) convenience utility (Whiting & Williams, 2013).

1.3.2 Using social media to learn in Canada

As explained by Whiting & Williams, information-seeking is one of the main reasons why people use social media. Whithing & Williams (2013) conducted 25 in-depth interviews with participants aged 18 to 56 on the subject of social media use and found that 80% of respondents reported using social media to seek out information and "self-educate". As reported by the Canadian Internet Survey in 2020, more than three-quarters of Canadians used social media to look up information (Statistics Canada, 2020). It is of particular interest to investigate how social media is used for learning because since the Covid-19 pandemic, there has been a dramatic increase in the use of social media for educational purposes (Akcil & Bastas, 2020; Hassell et al., 2021).

1.3.3 Using social media as a learning resource for outdoor enthusiasts in Canada

Although there has been very little research done on the matter, we can assume that outdoor enthusiasts use social media as a learning resource for four main reasons. First, as previously established, social media is widely used for information-seeking and self-education (Smith et al., 2016). Second, technology and social media are increasingly a part of outdoor experiences (Hills, 2019). Third, as demonstrated in the 2012 Canadian Nature Survey, the two leading ways that outdoor enthusiasts most use to acquire information about nature (including outdoor activities) are by watching visual media and reading publications (Federal and Provincial Territorial Governments of Canada, 2014). Visual media and publications are both some of the main types of content that can be consulted on social media. Fourth, there exists a plethora of educational content relating to outdoor activities on social media. This educational content is present across social media platforms and can be found in various forms such as posts, videos, and forums. Official Canadian outdoor organizations, professional guides, and amateur outdoor enthusiasts are all share educational content about their activities on social media.

1.4 Purpose, the research question, and the main objectives

1.4.1 Proposed study and purpose

The objective of this research project is to investigate how Canadian outdoor enthusiasts use social media to learn about their activities. More specifically, this research aims to provide evidence of the ways outdoor enthusiasts use social media to learn about their outdoor activities. This study also seeks to discover whether individual characteristics influence responses by examining how the respondent's age, province of residence disciplines practiced and outdoor level of expertise influence how they use social media to learn about outdoor activities.

1.4.2 Specific research questions

- How do Canadian outdoor enthusiasts use social media to learn about outdoor activities?

1.4.3 Objectives of the study

- Investigate how Canadian outdoor enthusiasts use social media to learn about their outdoor activities.
- Discover if there are links between the outdoor enthusiasts' individual characteristics (age, province of residence disciplines practiced and outdoor level of expertise) and use of social media.

1.4.4 Scientific relevance

Although there has been some research done on the way outdoor enthusiasts use social media in relation on their outdoor activities, these studies pertain only to one outdoor discipline and one specific social media platform (Arts, 2021; Kotut et al., 2020). Certain research does investigate the use of social media in a broader context during outdoor activities (Hills, 2019). However, this research centers around using social media in its general sense of use in the outdoor world (for example playing games on social media) (Reed, 2021). To our knowledge, this is the first study to consider social media as part of a learning strategy for the acquisition of knowledge relating to outdoor activities.

Furthermore, most research in the outdoor education field centers around formal outdoor education settings; however informal learning is increasingly a part of all learning settings. Consequently, more studies must research informal ways of learning about outdoor activities. Research that explores learning through social media is being developed in most fields of education, such as in science (Moll & Nielsen, 2017), art education (Huebner, Emma, 2022) and medicine (George et al., 2013). It is important for the field of outdoor education to also research this current topic.

1.4.5 Social relevance

Engaging in outdoor activities offers numerous psychological and physical health benefits (Breitenstein & Ewert, 1990; Coventry et al., 2021); however, it is important to acknowledge that outdoor activities can also pose certain risks (Tranquard & Bourbeau, 2014). It is therefore important for outdoor enthusiasts to have access to tools that help them to practice these activities safely. By providing foundational evidence of the ways outdoor enthusiasts use social media to learn about their activities, this research hopes to help inform the development of content that is more adapted to outdoor enthusiasts' needs. Furthermore, by considering individual characteristics such as the level of expertise and disciplines practiced when analyzing data, this research aims to help social media content creators develop content that best fit the need of their target audience.

CHAPTER 2
LITERATURE REVIEW

The purpose of this research is to investigate how Canadian outdoor enthusiasts use social media to learn about their activities. Thus, this chapter offers an analysis and presentation of literature on the subject of learning about the outdoors through social media. This literature review is divided into the three following sections: outdoor activities, social media, and outdoor activities and social media.

2.1 Outdoor activities

2.1.1 Defining outdoor activities and outdoor enthusiasts

There are numerous definitions surrounding the concept of the outdoors. In English, the term outdoors refers simply to the concept of a place situated outdoors (Donaldson & Donaldson, 1958; Gadais et al., 2019; Mercure, 2021; Priest & Gass, 2018). The outdoors can also refer to the concept of "out-of-doors", "fresh air" or "wilderness" (Priest & Gass, 2018). Some of the terms that are most commonly found in scientific literature pertaining to the outdoors are as follows: outdoor recreation (Ewert & Sibthorp, 2014), outdoor leisure (Gartner & Lime, 2000) outdoor pursuits (Miles & Priest, 1999), outdoor education (Donaldson & Donaldson, 1958) and adventure education (Beames & Pike, 2013). Outdoor recreation, also referred to as outdoor leisure, can be defined as "recreation that occurs outdoors in urban and rural environment" (Gartner & Lime, 2000; Jenkins & Pigram, 2003, p. 349). Outdoor pursuits refer to human-powered activities that take place outdoors in a natural setting (Miles & Priest, 1999). For example, hiking, rock climbing, skiing, snowshoeing, biking, canoeing and kayaking can all be qualified as outdoor pursuits (Gadais et al., 2019). Adventure education is often seen as a sub-branch of outdoor education that involves outdoor education activities that include a certain level of risk (Berry & Hodgson, 2011).

This study employs the term outdoor activities to refer to outdoor pursuits, as it is used more widely and internationally in scientific literature and colloquially by outdoor enthusiasts (Gadais et al., 2018; Gadais et al., 2019; Kuru, 2010; Morrissey & Rossi, 2013). Basing themselves on numerous studies, Bergeron & al. (2022) developed a very precise and adequate definition of outdoor activities:

> Physical activities that are practiced in a direct and harmonious relationship with the elements of nature in a state of mind of relaxation or adventure ranging from contemplation to risk-taking. Generally recreational in nature, these activities are self-propelled or practiced with the help of non-motorized mechanical assistance (sailing, cycling, etc.) or animals (horses, dogs, etc.). In addition, outdoor activities are practiced in a continuum of natural environments, ranging from urban to wilderness (municipal parks, backcountry, etc.).

> Outdoor physical activities that have a competitive purpose and are used to determine the elite (outdoor sports practiced in a competitive context: orienteering, relay races in cross-country skiing, slalom in whitewater kayaking, etc.) and other outdoor sports: soccer, volleyball, field hockey, etc.) as well as outdoor recreational activities (free, cooperative and supervised games, wildlife observation, astronomy, etc.) and outdoor harvesting activities (hunting, fishing, gathering) are excluded from this definition. (Bergeron et al., 2022, p. 23)

The term "outdoor enthusiast" is used in most Anglo-Saxon literature to describe people who practice outdoor activities (Humberstone et al., 2022; Rice et al., 2020).

2.1.2 Led outdoor activities

Outdoor activities can take place in a recreational manner (meaning unsupervised) or can also be led by outdoor leaders. As Martin et al. (2017) explain, outdoor leadership is the practice of leading individuals and groups during outdoor activities. Martin et al. (2017) identify three "primary aims of outdoor leaders": "to ensure the safety of program participants whom they are serving, to ensure the protection and preservation of the natural environment, to enhance the quality of outdoor experiences for program participants" (p.19). Outdoor leadership is characterized by the knowledge, skills and abilities of individuals used by leaders in outdoor settings (Shooter et al., 2009).

Although this research pertains to outdoor activities practiced recreationally and unsupervised, scientific literature in the field of the outdoors in relationship to education and learning mostly investigates led outdoor activities (LOA). Hence, this section presents literature about two forms of LOA: outdoor education and adventure tourism. Although this research does not directly pertain to outdoor education and adventure tourism, these forms of LOA are presented because by participating in these LOA, outdoor enthusiasts can learn and acquire skills about their activities.

2.1.2.1 Outdoor education

As previously explained, Donaldson & Donaldson (1958, p. 17) define outdoor education as education "in, about and for the outdoors". There are various forms of outdoor education such as environmental education that "aims primarily to promote the emergence of eco-citizens by responding to environmental education and pedagogical issues" (Beauchamp et al., 2022, p. 3; Bourg & Papaux, 2015) and adventure education which is defined as:

> A variety of teaching and learning activities and experiences usually involving a close interaction with an outdoor natural setting and containing elements of real or perceived danger or risk in which the outcome, although uncertain, can be influenced by the actions of the participants and circumstances. (Ewert. & Sibthorp., 2014, p. 3)

There are also numerous approaches to outdoor education. The following section describes three of these approaches: Udeskole, forest schools and experiential education. First, Udeskole, which translates to outdoor school, are "compulsory and regular educational activities outside the school building" (Bentsen & Jensen, 2012, p. 200). Udeskole activities entail incorporating outdoor elements and surroundings into the teaching of school curriculum subjects (Bentsen & Jensen, 2012). Second, forest schools are rooted in the concept of developing confidence and self-esteem through "hands-on learning experiences in a woodland environment" (O'Brien, 2009, p. 45). This concept focuses on learning through exploring nature and collaboration with others (Schäffer & Kistemann, 2012; Waite et al., 2016). Third, much research has tightly linked experiential education to outdoor education (Mercure, 2022). Experiential education has been defined "as a process through which a learner constructs knowledge, skill, and value from direct experiences" (Luckmann, 1996, p. 7). Outdoor education is considered experiential learning because students learn "by doing and experiencing" (Yildiz, 2022, p. 2). According to this approach, students acquire skills about activities through hands on learning and experience (Yildiz, 2022).

These various forms and approaches to outdoor education can be classified under one of the three types (in, about and for) of outdoor education defined by Donaldson and Donaldson (1958). Beauchamp et al. (2022) offer an interpretation of Donaldson and Donaldson's (1958) classification model. Activities that are in the outdoors are simply "activities that take place in an outdoor setting", (Beauchamp et al., 2022, p. 3). Activities for the outdoors are "activities that are aimed primarily at educating or raising awareness about outdoor, environmental or nature-related themes and issues", for example, environmental education (Beauchamp et al., 2022, p. 3). Finally, activities via the outdoors, such as adventure education activities, are "activities that aim to use the outdoors or nature as an active agent for the effects they will produce on the individual and his/her development" (Beauchamp et al., 2022, p. 3). Many authors such as Gadais et al. and Beauchamp et al. have interpreted these three types of categories of outdoor education (Beauchamp et al., 2022; Gadais et al., 2018). The following graphic demonstrates this interpretation by Beauchamp et al. of these three categories of outdoor education (Beauchamp et al., 2022).

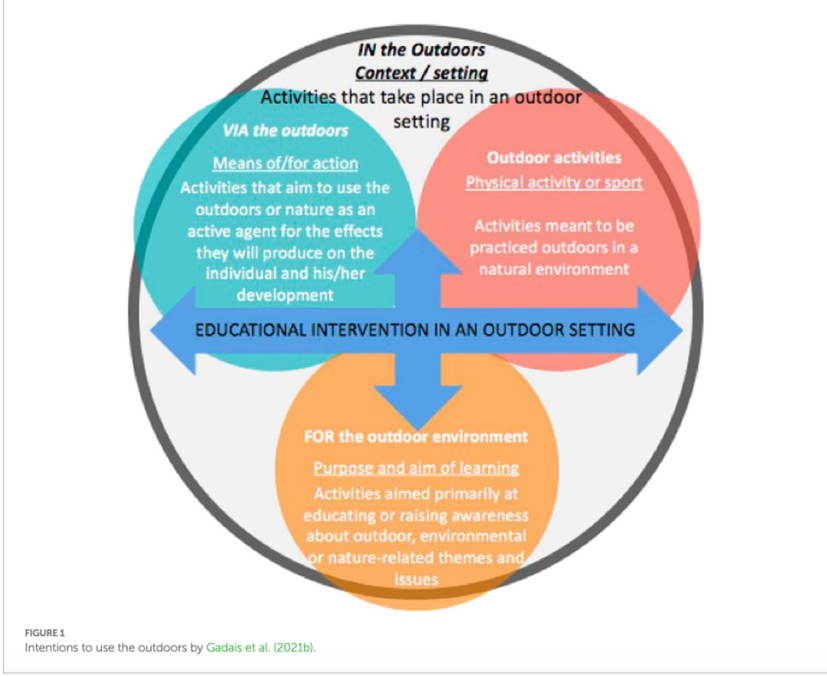

Figure 3. Intentions to use the outdoors (Gadais *& al.*, 2018; Beauchamp *& al.*, 2022)

2.1.2.1.1 Research in outdoor education

Most research in outdoor education centers around the outcomes of outdoor education activities on students (Becker et al., 2017; Mann et al., 2021; Neill & Richards, 1998). Because there is so much research surrounding outdoor education and this research does not directly pertain to outdoor education, this section is not meant to present an exhaustive in-depth analysis of the subject. By presenting some of the main literature reviews and meta-analyses on the subject, this section hopes to present some of the main findings.

In 1998, Neill & al. examined the three meta-analyses on the subject of the effects of outdoor education that existed at the time (1998). They conclude that these studies demonstrate that outdoor education "had a small to medium impact on typically measure outcomes such as changes in self-concept, self-confidence and locus of control" (Neill & Richards, 1998, p. 2). This summary of meta-analyses also found that the outdoor education programs that were most effective in generating positive effects among students had the following characteristics: they were long in duration, involved adult-age participants and were led by organizations (Neill & Richards, 1998). Since 1998, there have been numerous systematic reviews that analyze studies done on the benefits and outcomes of outdoor education activities on students. Some of these analyze the impacts of outdoor learning on school children (Becker et al., 2017; Mann et al., 2021), while others

concentrate on one specific outcome, for example, the systematic review led by Fang focused solely on the effects of outdoor education programs on adolescents' self-efficacy (Fang et al., 2021).

Two literature reviews that concentrate on outdoor education programs in specific geographical locations were identified. First, Remmen and Iversen conducted a scoping wide review of school-based outdoor education in Nordic countries. They identify some of the defining characteristics of outdoor education in Nordic countries (Remmen & Iversen, 2022). For example, they establish that multiple school subjects, notably science, are the most common subject matters addressed by outdoor education and that studies pertain to this topic most frequently investigated teacher's perspectives "followed by nature of outdoor education, well-being, and cognitive learning" (Remmen & Iversen, 2022, p. 1). Purc-Stephenson et al. conducted a systematic literature review of outdoor education in Canada in the article *We are Wilderness Explorers: A Review of Outdoor Education in Canada*. This review focuses on the educational outcomes, psychosocial benefits of outdoor education programs in Canada and factors that influence these programs (Purc-Stephenson, 2019). In this literature review, they identify eight main learning outcomes and psychosocial benefits: 1. developing outdoor-living skills, 2. risk and challenge, 3. gaining environmental knowledge, 4. personal growth, 5. sense of community, 6. building connections, 7. having fun in nature and 8. Lasting impact (Purc-Stephenson, 2019). They also observe that there is a uniquely Canadian way of doing outdoor education that "attempts to recreate early explorer or settler experiences" (Purc-Stephenson, 2019).

Last, we found one systematic review, conducted by Povilatis *& al*., that focuses on instructor behaviours and traits that influence participant outcomes in outdoor education settings (2019). They conclude that the "programmatic elements employed by instructors" that most impacted participant outcomes are: 1. incorporating elements of experiential learning, 2. debriefing and feedback and 3. participant reflection (Povilaitis, 2019, p. 222).

Outdoor education shares numerous common elements with other types of LOA. For instance, in both outdoor education and adventure tourism activities, participants can gain knowledge about these activities through experiential educational learning (Beedie & Hudson, 2003; McKenzie, 2003).

2.1.2.2 Adventure tourism

Buckley defines adventure tourism as "guided commercial tours where the principal attraction is an outdoor activity that relies on features of the natural terrain, generally requires specialized sporting or similar equipment, and is exciting for the tour clients" (2006a, p. 1). As Buckley explains "the distinctions between

nature tourism, ecotourism, adventure tourism, adventure travel, commercial expeditions, outdoor recreation and outdoor education are blurred" (2006a, p. 1). Adventure tourism activities are most commonly divided into two categories: soft adventure activities and hard adventure activities (Janowski et al., 2021). On the one hand, soft adventure activities are "usually guided, only incorporate low/perceived risk and can be conducted by novices as they require minimal skill" (Janowski et al., 2021, p. 2). On the other hand, hard adventure activities are "high risk and require advanced skills and serious commitment" (Janowski et al., 2021, p. 2). Adventure tourism is an integral part of worldwide tourism and is one of the fastest-growing tourism sectors (Janowski et al., 2021). One of the particularities in adventure tourism is that despite there being a certain level of risk in these activities, "participants do not have to be experts or highly skilled participants to sample an adventure activity" (Rantala et al., 2018, p. 345).

2.1.2.2.1 Research in adventure tourism

Like outdoor education, adventure tourism also has a large body of literature related to it. Because this research does not directly pertain to adventure tourism, this section does not seek to present an in-depth analysis of literature pertaining to this type of LOA, but rather focusses on literature reviews on the subject to inform the reader of the main trends and findings in adventure tourism.

Most literature in the adventure tourism fields centers around psychology and the reasons "why people engage in adventure activities and their experiences whilst doing so" (Buckley, 2006b, p. 75; Janowski et al., 2021). There are many different reasons that tourists choose adventure outdoor activities, including the pursuit of risk (Sung et al., 1996), seeking knowledge, heroism (Laing & Crouch, 2009), admiration of nature (Cater & Cloke, 2007), socializing (Ewert & Boone, 1987), and skill development (Pomfret, 2006). Additionally, accidents and risk management are also main themes relating to adventure tourism that are addressed in scientific literature. Buckley also states that there is an increasing body of literature pertaining to the impacts of adventure tourism activities on the environment (Buckley, 2006b)

2.2 Social media

2.2.1 Definitions

As explained by Ellison and Boyd (2007), social media is a difficult concept to define as it is constantly evolving. In the following section, social media is defined as considered in this study.

After analyzing a selection of social media definitions, Quan-Haase *& al.* (2022) conclude that "there exists a relative consensus as to the meaning of social media". They establish that social media, which is used as

an umbrella term that describes a variety of online platforms (Aichner et al., 2021), allows "individuals, communities, and organizations to interact with one another by providing a service that enables them to communicate and collaborate and to create, modify, and share content" (Quan-Haase & Sloan, 2022). Social media can be classified into different categories such as social networking sites, social media sharing websites, collaborative software and consumer review platforms (Quan-Haase & Sloan, 2022). For this study, only the four following social media categories were considered: social networking sites, social media sharing websites, microblogging, and social news (please see Figure 4 for the exact definitions of these categories as considered in this study). It is also important to note that in this study, social media and Web 2.0, defined as technology "that lets users become active producers of the knowledge that accumulates on the Web", are considered interchangeable terms (Venkatesh et al., 2014). Please see Appendice A for a full glossary of the social media terms used throughout this research.

Table 2.2 Types of social media

Type of social media	*Examples*	*Definitions*
Social networking sites	Facebook, LinkedIn	'Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system' (boyd and Ellison, 2007: 211)
Bookmarking	Delicious, StumbleUpon	'Provide a mix of both direct (intentional) navigational advice as well as indirect (inferred) advice based on collective public behavior. By definition – these social bookmarking systems provide "social filtering" on resources from the web and intranet. The act of bookmarking indicates to others that one is interested in a given resource. At the same time, tags provide semantic information about the way the resource can be viewed' (Millen, Yang, Whittaker, and Feinberg, 2007: 22)
Microblogging	Twitter, Tumblr	'Services that focus on short updates that are pushed out to anyone subscribed to receive the updates' (Grahl, 2013: n.p.)
Blogs and forums	LiveJournal, Wordpress	'Online forums allow members to hold conversations by posting messages. Blog comments are similar except they are attached to blogs and usually the discussion centers around the topic of the blog post' (Grahl, 2013: n.p.)
Media sharing	YouTube, Flickr, Pinterest	'Services that allow you to upload and share various media such as pictures and video. Most services have additional social features such as profiles, commenting, etc.' (Grahl, 2013: n.p.)
Social news	Digg, Reddit	'Services that allow people to post various news items or links to outside articles and then allows it's users to "vote" on the items. The voting is the core social aspect as the items that get the most votes are displayed the most prominently. The community decides which news items get seen by more people' (Grahl, 2013: n.p.)
Collaborative authoring	Wikipedia, Google Docs	Web-based services that enable users to create content and allow anyone with access to modify, edit, or review that content (Archambault et al., 2013)
Web conferencing	Skype, GoToMeeting, Zoho Meeting	'Web conferencing may be used as an umbrella term for various types of online collaborative services including web seminars ("webinars"), webcasts, and peer-level web meetings' (Web conferencing, n.d.)
Geo-location based sites	Foursquare, Yik-Yak, Tinder	Services that allow its users to connect and exchange messages based on their location
Scheduling and meeting	Doodle, Google Calendar, Microsoft Outlook	Web-based services that enable group-based event decisions (Reinecke et al., 2013)

Figure 3. Different social media categories (Quan-Haase & al., 2022)

2.2.2 Online community of practices

Communities of practice can be defined as "groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis" (Wenger et al., 2002, p. 4). In online communities of practices (also referred to as virtual community of practices), these interactions take place virtually on social media platforms. As Johnson establishes, "virtual communities are defined as […] community of practices using current networked technology" (Johnson, 2001, p. 45). An example of an online community of practice is a *Facebook* group dedicated to a niche subject, for example: "ultra-light backpacking in Canada". These online communities of practice can be commercial where users interact with businesses or they can also be strictly non-commercial where "citizens create their community of interest" (Plant, 2004). What brings users to become members of a particular online community of practice is similar concerns, questions or ideas (Venkatesh et al., 2014). For example, in the case of outdoor activities, outdoor enthusiasts form online communities of practices form based on their shared interest in certain outdoor disciplines. As Wenger explains, some online communities of practice are very formal and member inclusion is clearly defined, whereas in other cases, communities of practice are very fluid and informal (Wenger, 2011). Thus, if we transpose these definitions to a social media context, we can conclude that one clear-cut well-defined definition of an online community of practice does not exist and that the term encompasses most user interactions on social media platforms. The most important characteristic of an online community of practice is participation, meaning that members of a certain community of practice participate in the identity construction of the community (Wenger, 2011).

Online communities of practice can pertain to different purposes (Venkatesh et al., 2014). First, there are online learning communities of practice where the purpose is mainly to learn. Second, there are task-based learning communities where users focus on solving common issues or problems. Third, practice-based communities center around gathering people who share a similar field of interest. Finally, knowledge-based communities "share characteristics of both task-based communities and practice-based communities in that the group is concerned with the advancement of knowledge in a particular field of endeavour" (Venkatesh et al., 2014, p. 231). In this study, the online communities of practice that are included are non-commercial and fit into all the categories enumerated above.

2.2.3 Informal learning

Informal learning is defined as a highly collaborative nondidactic way of learning that builds on the learner's initiative or interests and does not involve assessment external to the activity (Callanan et al., 2011; Rogoff et al., 2016). In other words, informal learning is a type of learning that occurs outside institutional settings. Rogoff & al. (2016) explain that informal learning takes place in all sorts of settings, such as in workplaces or family groups. Furthermore, in informal learning is rooted in conversational practices, as opposed to didactic discourse (Bekerman et al., 2006; Rogoff et al., 2016). Informal learning is rooted in the concept that learning is a lifelong process that takes place beyond framed educational contexts (Rogers, 2014).

A few examples of informal learning are as follows: learning a specific skill from a family member and learning something from a friend. Learning on social media is also considered a form of informal learning (Greenhow & Lewin, 2016).

2.2.4 Learning on social media

Considering that the literature about learning through social media is very broad and that social media evolves and mutates at a very fast speed, we chose to include in this section of our literature review, only articles published within the last 10 years.

First, it is important to establish that learning on social media is widespread and one of the main reasons that draw people to use these platforms (Kumar & Gruzd, 2019). Learning on social media is considered in this study as an informal way of learning where users learn about a subject either intentionally or unintentionally (Dron & Anderson, 2014). Intentional learning on social media occurs when a user deliberately looks up information regarding a certain topic (Dron & Anderson, 2014), for instance, looking up a Youtube video to learn about what outdoor gear to bring on a winter camping expedition. Unintentional learning on a social media platform occurs most often when "scrolling" on a social media platform: a user will pick up certain knowledge, for instance, scrolling on Instagram and coming across a post that describes the various phases of hypothermia. Unintentional learning on social media is also described as "subconscious learning" (Brandtzæg & Heim, 2009; Sourina et al., 2015).

2.2.4.1 Main fields where the subject is developed

As explained by Rehm, Manca and Greenhow "while not conceived or designed for educational purposes, social media have become increasingly popular for formal and informal learning in many disciplinary areas" (Rehm et al., 2019, p. 2). After concluding that research regarding social media in education across

disciplines is lacking, Rehm & al. (2019) conducted a mapping review of 80,267 articles on the subject. In this research they demonstrate that most of the research on social media learning is conducted in the following topical domains: medicine, applied sciences, health care, management, information sciences, psychology and social sciences (Cheston et al., 2013; Hashim et al., 2018; Rehm et al., 2019; Selwyn, 2012). Furthermore, numerous studies explore the impacts of integrating social media into formal educational settings. These studies range from integrating social media learning into primary and high school classrooms (Dennen et al., 2020; Greenhow & Askari, 2017; Szeto et al., 2016) to integrating social media learning into higher education (Chugh & Ruhi, 2018; Selwyn, 2012). In all these fields of research, the advantages, and disadvantages of using social media for educational purposes are identified.

2.2.4.2 Advantages of using social media to learn

Research has shown that there are numerous advantages to including social media in an educational context (Greenhow & Lewin, 2016). These advantages include an increase in communication, collaboration and resource sharing (Greenhow & Lewin, 2016). Social media allows us to connect and share knowledge with users from around the world and share knowledge with these users (Dron & Anderson, 2014). Moreover, in an educational context, social media is proven to be a way to help engage students in learning (Global & Information Resources Management, 2018). Finally, one of the main advantages of using social media to learn is it provides a "source to reach information without time and place limitations" (Yaşar & Karadeniz, 2011). Social media is a way for people to actively teach themselves skills and competencies (Yaşar & Karadeniz, 2011)

2.2.4.3 Disadvantages of using social media to learn

Some of the main disadvantages to learning through social media are privacy and security issues as well as information reliability (Cheston et al., 2013; Hashim et al., 2018). On social media platforms, there is no official vetting process in which unreliable or potentially dangerous information that is shared is removed (Ozturk et al., 2015). Moreover, social media is notorious for spreading "fake news", that is to say, news with intentionally false information (Shu et al., 2017). As explained by Guo et al. (2022), disinformation on social media influences our opinions and decisions in all spheres of life. Furthermore, using social media for learning can also be a source of distraction and enhance time management difficulties (Yunus et al., 2012). As presented by Chung and Koo in their study about the use of social media in travel and information search, when using social media to acquire information regarding a subject there is almost always a "trade-off" between the costs and benefits, meaning the user is confronted simultaneously to the advantages and disadvantages of using this medium (Chung & Koo, 2015).

2.2.4.4 Using social media to search for information

In the previous sections, we discussed research that focused on learning through social media in a broader sense. In this section, we focus on the scientific literature that addresses the subject of using social media to search for information.

Numerous studies investigate how social media is used to search for information about a specific topic. This literature review found that research centered around using social media for information search is most developed in the following domains: tourism, health, and politics. First, some research discusses how the use of social media to search for travel information has altered the tourism industry (Chung & Koo, 2015; Xiang & Gretzel, 2010). Indeed, information searching on social media help travellers not only plan their very own trips but be inspired by others' travels (Chung & Koo, 2015). Second, arguably, the topic that is the most searched on social media is health information (Zhao & Zhang, 2017). Some of the reasons why people chose to research information on their health on social media are as follows: emotional support relating to medical conditions, and effective treatment options for various conditions (Zhao & Zhang, 2017). Third, social media is also used to search for news information (Stephens et al., 2014). News information search on social media has been shown to influence political knowledge and views (Stephens et al., 2014).

It is important to note that the purpose behind information search on social media extends beyond the acquisition of knowledge. A few of the other main reasons why social media is used to search for information in a wider sense are as follows: entertainment, relaxation, expression of opinion, information sharing and knowledge (Hamid et al., 2016).

2.3 Social media and outdoor activities

Although the field of research about the links between social media and outdoor activities is emerging, little research has been done. Hence, this literature review of this theme includes all peer-reviewed literature found on the subject is included. First, because there is very little research done on learning about outdoor activities on social media, the subject of social media used in relation to outdoor activities is addressed. We identify two main subcategories of research done: social media used to share images related to outdoor activities and social media used to connect with other outdoor enthusiasts. Second, because only a few studies were found on the topic, we also examine scientific literature on the integration of technology in its larger sense within the outdoor education world.

2.3.1 Social media to share images related to outdoor activities

Numerous studies look at the use of smartphones in outdoor contexts. However, these studies consider all the functionalities present on smartphones such as text messaging, phone calls and social media (Bolliger et al., 2021). A few studies consider how images of nature are shared on social media. For example, the concept of *Nature 2.0*, coined by Büscher, identifies the relations between new media and the nature conservation (Büscher, 2016). Büscher states that the concept of *Nature 2.0* includes "sharing, liking and linking […] through social media, and indeed captures the full spectrum of possibilities for interactive online communication and action" (2016). This concept is applied to describe how images of nature commodify nature and construct it as a product to be consumed (Büscher & Igoe, 2013). Although the research done by Büscher is pertinent to our study, this research looks at how images of nature influence conservation and environment protection, whereas our study pertains to outdoor activities. Four studies that specifically investigate the sharing of images of outdoor activities on social media were identified. First, Mackenzie and al. (2017) examine how social media can deliver nature-related messages to underserved urban youth. They identify identifies six different themes related to how images of the outdoors shared on social media influence participants' perceptions about outdoor activities: unique experiences, escape, social connections, challenge, adventure and accessibility (Mackenzie et al., 2017). Second, Gray et al. (2018) explores images of women in the outdoors shared on social media. The commodification of nature also emerges as a theme: images of women in nature shared on social media shape what it means to be a woman who practices outdoor activities (Gray, 2018). Third, Arts and Fisher (2021) conduct a broader study of the sharing of images of outdoor activities on social media. This study "investigates the interactions between Instagram users and the platform's features and how these interactions influence the users' own outdoor experiences" (Arts, 2021). The authors conclude that outdoor enthusiasts share idealized and aesthetic images of their experiences in the outdoors, but that they these images don't truly represent authentic experiences in nature. Finally, this Disneyization of nature is also explored in Leather et al.'s (2019) study where images of nature shared on social media are described as contributing to the construction of hyperreal outdoor experiences.

2.3.2 Social media to connect with other outdoor enthusiasts

Social media is also used by outdoor enthusiasts to connect with other enthusiasts and plan adventures. This angle is surveyed in the article *Preparing for the Unexpected: Community Framework for Social Media Use and Social Support by Trail Thru-Hikers* where the authors examined over 1000,000 Reddit posts and comments regarding the Appalachian Trail to "understand hikers' identity as community members" (Kotut et al., 2020). In this article, Kotut & al. (2020) identified a unique sense of community of these hikers that manifested throughout their online interactions. In their study of one particular social media forum, Boutroy

discusses one particular social media forum *Randonnée-léger,* a website where users share insight about reducing the weight of their backpack (Boutroy, 2022). This study concludes that an internet forum specialized in an outdoor discipline can allow users to share skills in a creative, collaborative and free manner (Boutroy, 2022).

2.3.3 Outdoor education and technology

Although the subject of outdoor education and technology does not directly pertain to this research topic, because there is so little research done about social media and outdoor activities, it is important to take a step back and consider the integration of technology into the outdoor education world with a broader view. Moreover, because there is so much research done about the integration of technology into outdoor education settings, this further demonstrates that technology, including social media, is becoming more and more prevalent in outdoor activities.

The literature review for this section began with a broad search of the links between outdoor education and technology. During this research, three main themes quickly emerged: outdoors and technology considered in a broader perspective, the advantages, and the disadvantages of including technology in outdoor activities.

2.3.4 Outdoors and digital technology

Technology related to the outdoors can viewed through a wide lens, meaning that technology can refer to "traditional technology" such as material innovations (Shultis, 2012a). Within the past decades, there have been numerous "traditional technological" advancements in the outdoor world, for instance, the development of innovative products such as integrated stove/pot cooking systems (Beames, 2017). Most research that addresses "traditional technology" advancements in the outdoors focuses on the "technological explosion surrounding equipment and clothing" relating to outdoor activities and how these new innovative products make experiences in the outdoors more accessible" (Cuthbertson et al., 2004). Nonetheless, most of the research that investigates these links between the outdoors and technology focuses on digital technology. Digital technology refers to the use of electronic devices such as location devices, digital cameras, cellphones, drones, tablets and augmented reality (Hills, 2019). Most studies in this field seek to examine the effects of integrating digital technology during outdoor experimental learning experiences. There have been two systematic reviews of literature conducted on this theme. In *Digital technology and outdoor experimental learning,* Hills & Thomas (2019) propose a framework for integrating technology in outdoor experimental learning settings. In their article, *A systematized review of the use of mobile technology in outdoor learning* van Kraalingen (2021) also carried out a systematic review of studies that relates to the

subject of technology in outdoor learning contexts, but this review of literature focused on mobile media, defined as "any electronic, wireless, handheld device that can serve as a tool for cellular communication, the documentation of information and provides access to online resources". The following section highlights some of the advantages and disadvantages identified in these two reviews.

2.3.5 Advantages of including technology in outdoor activities

These two systematic reviews highlight several advantages of integrating technology into outdoor settings. First, that technology can enhance learning in the outdoor environment by providing additional opportunities (Wattchow & Brown, 2011). These technologies provide additional "hard-skill" learning opportunities such as learning navigation skills with a GPS (Hills, 2019), as well as providing "soft-skill learning opportunities" such as developing interpersonal and collaborative skills (van Kraalingen, 2021). Technology can also be used to discover information about outdoor activities, for example learning about nature management by certain organizations (Midgley, 2014). Second, several studies show that integrating technology into outdoor education settings increases the motivation of participants to participate in outdoor activities by providing fun and engaging new ways to interact with the natural world (van Kraalingen, 2021). For example, one study demonstrates that integrating photo elicitation and online journaling can contribute to memorable environmental learning experiences (Ardoin et al., 2014). Finally, integrating technology into outdoor settings provides can provide an extra layer of safety (Hills, 2019). For example, one study demonstrates that GPS increases the security and safety of outdoor enthusiasts by always providing them with their exact location (Raven, 2009). The use of technology can therefore increase positive and safe interactions between outdoor enthusiasts and the natural world.

2.3.6 Disadvantages of including technology in outdoor activities

Numerous disadvantages of integrating technology into outdoor educational settings were also identified in the systematic reviews led by van Kraalingen (2021) and Hills (2019). Technology can be a source of distraction in outdoor education settings and can cause participants to be less connected to the outdoor world (Shultis, 2012a). Some studies show that participants become less focused on the tasks they need to accomplish in the outdoors when technology is present (Smith et al., 2016). Studies analyzed in these systematic literature reviews also show that technology presents a threat to experiencing a direct experience in the outdoors because technology creates a certain lens or barrier with the outdoor world (Wattchow & Brown, 2011). Nonetheless, this concern is brought up mainly by outdoor educators, as opposed to participants (van Kraalingen, 2021). Furthermore, an overreliance on technological devices can increase the risks of accidents should a location device fail. For example, one study showed that "some accidents have

been recorded after the failure of location devices was conflated with an absence of map-reading skills" (Hills, 2019). Because outdoor activities take place outside and there are not chargers everywhere, there is a risk of having to stop an activity when a battery runs out and there is no option to charge the device (Midgley, 2014). Finally, seeing as our study relates to social media which is most often used on cellphones, it is important to note that cellphones were seen as the most disruptive technological device (Bolliger et al., 2021).

2.3.7 Frameworks for integrating technology in outdoor experimental settings

Both systematic reviews of the literature propose frameworks that summarize the advantages and disadvantages of integrating technology in outdoor education settings. However, the Digital Technology in Outdoor Experiential Learning (DTOEL) framework proposed by Hills and Thomas is specifically meant to be used by outdoor educators to determine whether technology should be integrated into an outdoor activity.

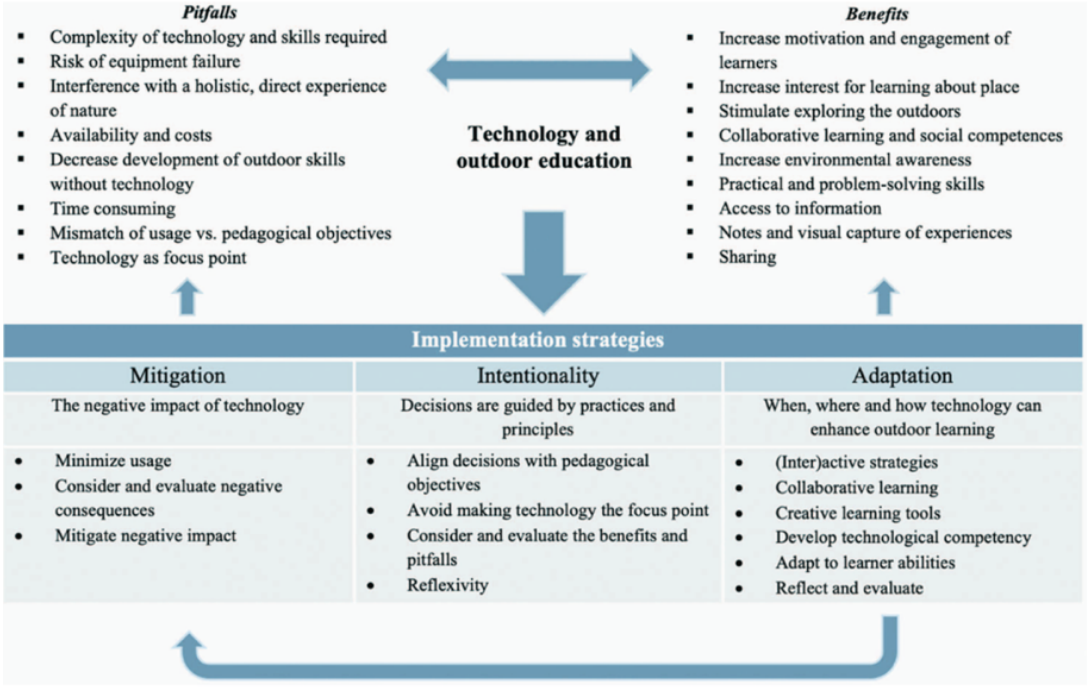

Figure 4. Considerations for implementing mobile technology (van Kraaligen, 2021)

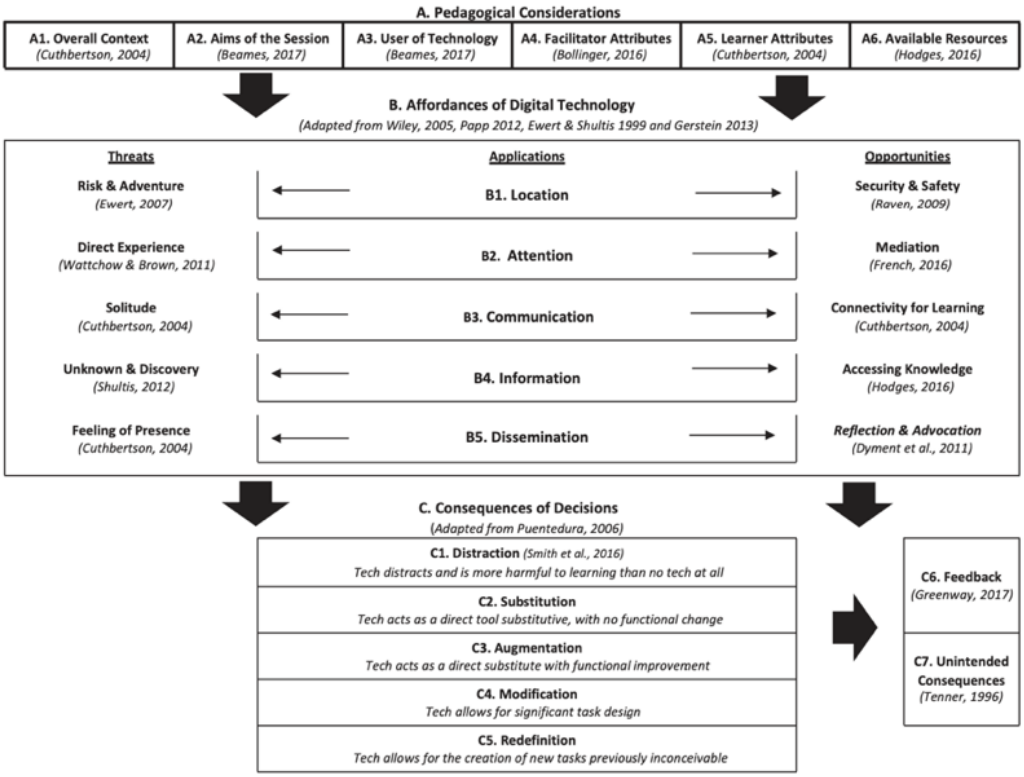

Figure 5. Digital Technology in Outdoor Experiential Learning (DTOEL) (Hills and Thomas, 2019)

CHAPTER 3
THEORETICAL FRAMEWORK

This chapter presents three conceptual or theoretical models that are relevant to this study: the connectivism learning theory (Siemens, 2004), the brick wall model for core competencies in outdoor leadership (Priest & Gass, 2018) and the SOMA (subject, object, milieu and agent) didactic model (Legendre, 2005). Because there are currently no learning theories that directly pertain to the subject of learning about outdoor activities on social media, this chapter links these three conceptual models together and proposes and adaption of these models adapted to learning about the outdoors on social media.

3.1 Connectivism

Connectivism is a learning theory developed by Siemens in 2004 in order to create a learning theory model adapted to the era of technology (2004). Corbett & Spinello (2020, p. 3) define connectivism as "the nexus between human learning and the ubiquitous access to knowledge by the current technological environment"(Corbett & Spinello, 2020, p. 3). This learning theory places technology at the center of learning and posits that informal learning that takes place on technological devices is an integral part of learning and knowledge-sharing (Siemens, 2004). Connectivism is also rooted in the idea that learning takes place through connections and the creation of online networks (Siemens, 2004).

According to Siemens, behaviourism, cognitivism and constructivism do not fit the current landscape of learning and knowledge transmission (2004). Connectivism helps to create a learning theory that is adapted to the digital age by moving beyond learning as simply learning "what to do", "what to think" or "how to make sense" (Boyraz & Ocak, 2021). Crosslin (2016) places connectivism on a continuum with other learning theories. On the one hand, typically, if a learning situation requires significant guidance from instructors or teachers, the learning situation is constructed with an instructivist approach. On the other hand, if learners acquire knowledge through self-discovery and reflection, then the learning situation corresponds rather more closely to a constructivist approach (Crosslin, 2016). Finally, if the learner can derive considerable benefits from connection with other learners or networks, then this learning approach is oriented towards connectivism (Crosslin, 2016).

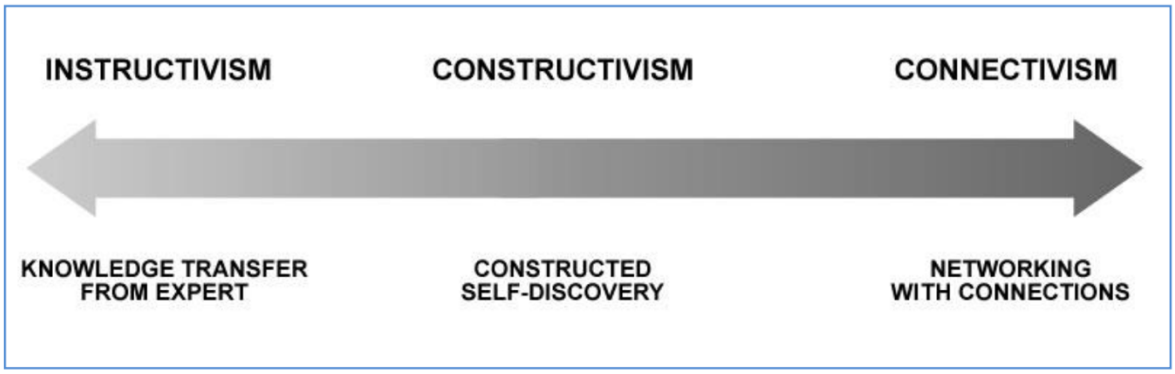

Figure 6. Learning theories at a level (Crosslin, 2016)

Siemens developed eight core principles of connectivism which are as follows (2004):

1. Learning and knowledge rest in diversity of opinions
2. Learning is a process of connecting specialized nodes or information sources
3. Learning may reside in non-human appliances
4. Capacity to know more is more critical than what is currently known
5. Nurturing and maintaining connections is needed to facilitate continual learning
6. Ability to see connections between fields, ideas, and concepts is a core skill
7. Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities
8. Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

3.1.1 Connectivism applied to learning about outdoor athrough social media

Connectivism applies to learning about outdoor activities through social media, as outdoor enthusiasts acquire knowledge through technology in an informal manner. Outdoor enthusiasts can learn about their activities in a self-directed manner through social media content. This learning does not take place in a specific given pace, such as during a physical in person outdoor course, but rather takes place through "interactions between, individuals, societies, organizations, and the technologies that link them" (Goldie, 2016). Outdoor organizations, professional outdoor leaders, influencers who post content about outdoor activities and outdoor enthusiasts can all learn about their activities through social media. Hence, this learning can be seen as collaborative and based on online connections between these various social media

users (Goldie, 2016). This research considers that knowledge about outdoor activities does not solely reside in fixed locations, people, or objects, but can also be distributed across online networks, such as social media. The importance of networked spaces is an integral part of connectivism (Siemens, 2004), and as van Kraaligen *& al.* explain "networked spaces and connectivity play a critical role in and beyond outdoor education" (2022).

In this study connectivism is considered as the lens with which educational content about outdoor activities on social media is considered and approached. The questions that are a part of the survey in this research are developed considering the eight core principles of connectivism. The following table explains how each core principle of connectivism developed by Siemens is applied and considered in this research (2004).

Table 1. Connectivism principles applied to research on using social media to learn about outdoor activities

Connectivism principle	Applied to research on using social media to learn about outdoor activities
1. Learning and knowledge rest in diversity of opinions	Outdoor enthusiasts can acquire knowledge about their activities from different sources. This exposure to diverse sources and viewpoints enhances learning about outdoor activities.
2. Learning is a process of connecting specialized nodes or information sources	Outdoor enthusiasts make connections between different sources of information. For example, outdoor enthusiasts can connect information acquired through an outdoor course to information that is present in social media content.
3. Learning may reside in non-human appliances	Outdoor enthusiasts can acquire knowledge about their activities through non-human appliances, such as social media.
4. Capacity to know more is more critical than what is currently known	Learning about outdoor activities should not be simply about acquiring a fixed body of

	knowledge, but rather about constantly learning through information that is evolving.
5. Nurturing and maintaining connections is needed to facilitate continual learning	Creating connections with other outdoor enthusiasts is essential for ongoing learning about outdoor activities. These connections can take place on social media.
6. Ability to see connections between fields, ideas, and concepts is a core skill	Acquiring knowledge about outdoor activities should be considered in a holistic manner. Learning about outdoor activities encompass a wide variety of disciplines, such as physical education, science and environment, and effective learning about outdoor activities should seek to create links between these domains.
7. Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities	Knowledge about outdoor activities is not fixed, but rather constantly evolving. Social media allows outdoor enthusiasts to constantly acquire new information about their activities.
8. Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.	Although social media users can acquire information about outdoor activities subconsciously, they can also choose to deliberately learn about a specific subject relating to outdoor activities. For instance, outdoor enthusiasts can choose to ask a question on a social media forum or look up a video about a specific subject on a social media platform.

3.2 Brick wall model of core competencies for effective outdoor leadership

Priest and Gass (2018) developed the brick wall model which considers the skills necessary for "effective outdoor leadership" (see figure 7. This model has been widely used in research related to outdoor activities (Hobbs, 2009; Lewis & Kimiecik, 2018; Medina, 2004). Although these skills are meant to applied to evaluate outdoor leadership, they are also relevant to abilities and skills outdoor enthusiasts require to practice their activities recreationally and unsupervised.

These skills are divided into three types: hard skills, soft skills and meta skills. First, hard skills are "solid, tangible and measurable" and refer to technical skills, for example knowing how to tie different knots, pitching a tent, or navigating with a map and a compass. Priest & Gass (2018) divide hard skills into three categories: technical activity skills, safety and risk skills, and environmental skills. Second, soft skills refer to abilities that are more difficult to evaluate and represent leadership and interpersonal skills. A few examples of soft skills in outdoor leadership include "organization, instruction and facilitation" (Priest & Gass, 2018). Third, meta skills, also referred to as conceptual skills or operational skills (Shooter et al., 2009), are skills that overlap with both hard and soft skills. Meta skills are core competencies that cement hard and soft skills together (Priest & Gass, 2018). Effective communication, professional ethics, problem-solving, decision making and sound judgement are all considered meta skills (Priest & Gass, 2018)

Figure 7. The brick wall model of core competencies for effective outdoor leadership (Priest & Gass, 2018)

3.2.1 Hard skills

Because the topic of this study was originally centered mainly around outdoor enthusiasts using social media as a learning resource to acquire knowledge about hard skills, the following section presents a more in-depth look into hard skills.

The expression hard skills, also referred to as technical skills, is used in a general sense to describe the "processes, procedures, tools and techniques" that are related to the acquisition of hands on knowledge and competencies (Hendarman & Cantner, 2018, p. 141). Hard skills are also explained as the ability to use "tools" (Hendarman & Cantner, 2018). In a standard professional context, these tools often refer to software, such as various scheduling tools (Hendarman & Cantner, 2018). In the context of outdoor activities, these tools often refer to outdoor gear. Hence, in an outdoor activities' setting hard skills can notably refer to as the ability to properly use and select outdoor gear, such as knowing how to navigate using a map and compass (Martin et al., 2017). Martin & al. define hard skills as "proficiency in particular outdoor activities

as well as experience-based competence and professional competency" (2017, p. 9). First, proficiency refers to the acquisition of technical skills in a general sense. Second, experience-based competency is the acquisition of technical skills through hands-on outdoor experiences. Third, professional competency indicates the acquisition of hard skills through professional certifications (Martin et al., 2017).

As previously explained, Priest and Gass categorize hard skills into three categories: technical activity skills, safety and risk skills, and environmental skills (Priest & Gass, 2018). There are various competencies that fit into each one of these categories. Some of the specific competencies associated with each category of hard skills are highlighted in the following table (Attarian et al., 2009; Martin et al., 2017; Priest & Gass, 2018).

Table 2. Types of hard skills (Attarian & al., 2009; Priest & Gass, 2018)

Type of hard skill	**Specific competencies**
Safety skills	• Wilderness first aid • Survival skills • Risk management skills
Technical skills	• Outdoor/equipment selection • Specific technical skills relating to the activity (knot tying, paddle strokes, packing backpack in a certain manner) • Specific technical skills relating to camping (installing tents and tarps, starting fires, cooking on outdoor stoves)
Environmental skills	• Leave No Trace skills • Environmentally sustainable choices relating to outdoor activities

3.3 The SOMA model

The SOMA (subject, object, milieu and agent) model was developed by Legendre and describes the relationships between the subject/learner (S), the object/content (O), the "milieu" or the setting in which the learning is taking place (M), and the agent (A) (Legendre, 2005).

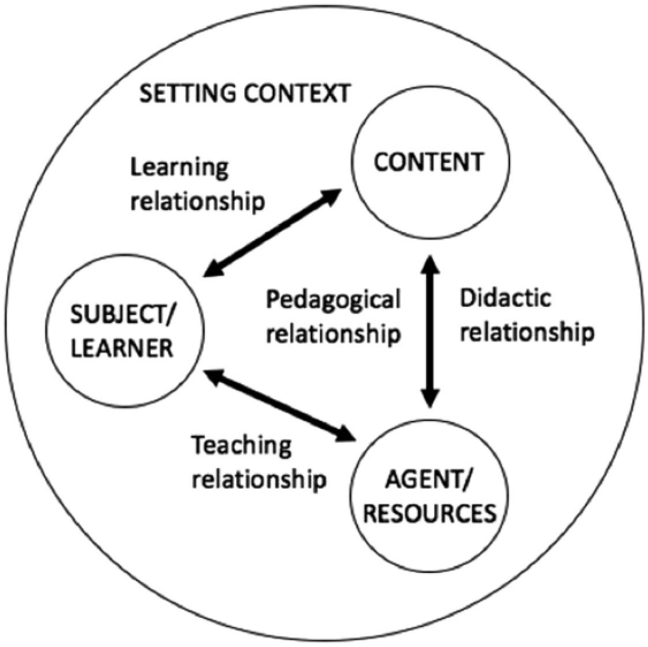

Figure 8. Legendre's didactic model (2005), translated by Beauchamp *& al.* (2022)

1. The subject (S) refers to an individual or group who are engaged in the process of acquiring knowledge.
2. The object (O) refers to the content or all the information and material that is intended to be learned. The object can also be explained as the learning objectives.
3. The "milieu" (M) refers to the educational environment or setting and encompasses the human, material, or natural surroundings where the learning activities occur.
4. The agent (A) comprises the human, technical, pedagogical, and material resources that are utilized to facilitate the pedagogical relationship and promote the acquisition of the subject material (the object).

   (Beauchamp et al., 2022; Germain, 1989; Legendre, 2005)

Legendre's model also proposes four different types of relationships between these four elements. First, there is the *didactic relationship* which refers to the relationship between the agent and the object. Second, there is the *leaning relationship* that explains the relationship between the subject and the object. Third, the *teaching relationship* invokes the relationship between the agent and the subject. Fourth, the *pedagogical relationship* refers to the relationships between the subject, the object and the agent.

In this study, the *learning relationship* is the most important relationship. This relationship explains the relationship between the outdoor enthusiast who is using social media and the educational content about outdoor activities present on social media. Hence, this relationship pertains directly to our research question looking at how outdoor enthusiasts use social media as a learning resource.

3.4 Didactic framework for learning about outdoor activities through social media

Numerous studies have adapted and applied Legendre's SOMA model to various fields. For example, Germain adapted the model to propose a conceptual framework for language didactics (Germain, 1989; Gut, 2014), while Allard & Boucher adapted the SOMA model for learning in museums (Allard & Boucher, 1998). Huebner basing herself on Allard & Boucher's adaptation demonstrated how the SOMA model could be applied to museum education through social media (Huebner, Emma 2022). Finally, Beauchamp et al. applied SOMA's model to outdoor education (Beauchamp et al., 2022).

The following model presents our own adaptation of the SOMA model (Legendre, 2005) applied to learning about outdoor activities through social media. This adapted model which is based on previous adaptations of the SOMA model is notably also influenced by connectivism (Siemens, 2004) and the brick wall model of core competencies for effective outdoor leadership (Priest & Gass, 2018). This model has yet to be tested and therefore has limits. Nonetheless, it is presented to help the reader better understand the different actors and relationships present in the context of learning about outdoor activities through social media.

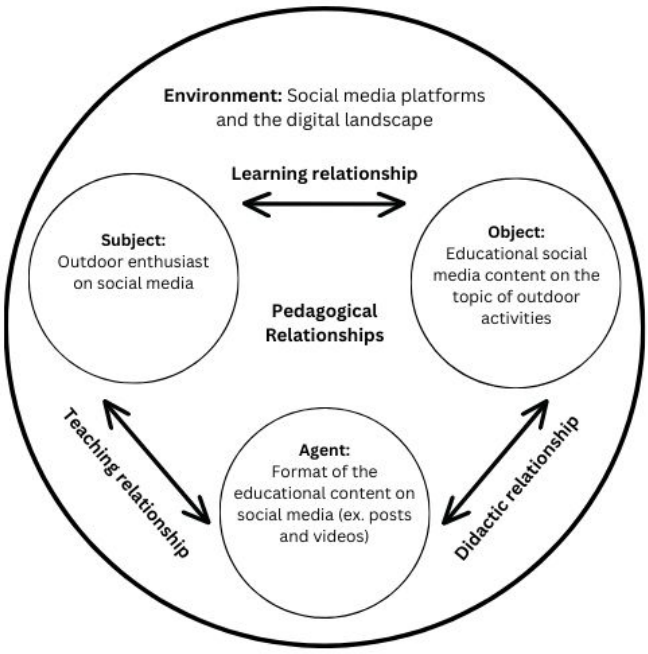

Figure 9. SOMA Model adapted to Learning about outdoor activities on social media

1. The subject (S): In terms of learning about outdoor activities through social media, the subject refers to the social media user. More particularly, in this case, the subject refers to the outdoor enthusiast who is using social media.
2. The object (O): In the context of learning about outdoor activities through social media the object are the skills that are attempted to be transmitted via social media.
3. The environment (M): In the context of learning about outdoor activities through social media, the environment refers to social media platforms and the larger online context (Huebner, Emma 2022; Huebner, 2023).
4. Agent (A): In this model, the agent refers to refer to the format of the educational content on social media, for instance posts and videos; for an agent is a resource, that can be material or pedagogical, offered to a learner (subject) in a learning situation (Legendre, 2005, p. 34). For example, users of social media platforms can learn about a specific notion by looking and listening to the content in posts and videos found on social media platforms (Gómez-Ortiz et al., 2023). Traditionally the agent refers to the teacher; however, in the context of learning through social media there is no official "teacher". It is important to note that in previous research that uses the SOMA model applied to learning through social media, content creators have also been defined as the agents (Huebner, 2023). Hence, although this model opts to define the "agent" as the format of the educational content, the agent could also potentially refer to content creators. In the context of learning about outdoor

activities through social media, these content creators could be for example ordinary outdoor enthusiasts, outdoor professionals (for example guides), influencers or outdoor organizations.

In the adaptation of the SOMA model for learning about outdoor activities through social media, the *didactic relationship* refers to the relationship between the content creators and the educational content on the topic of outdoor activities on social media. The content creators create educational or informational content relating to outdoor activities. Then, the learning *relationship* explains the relationship between the outdoor enthusiast who is using social media and this content. The outdoor enthusiast is learning about outdoor activities through this content whether it is deliberate or unintentional. Third, the *teaching relationship* invokes the relationship between the social media content creators and the outdoor enthusiasts who are viewing this content. Finally, the *pedagogical relationships* refer to the relationships and interactions between the outdoor enthusiast, the content creators, and the social media content.

CHAPTER 4
METHODOLOGY

This chapter summarizes the main steps of our methodology. Notably, it describes the research design, the data collection tools, the sampling method and the data analysis procedures. Toward the end of this chapter, the validity of this research and its limits is also discussed.

4.1 Research design

This research uses a mixed methods design and can be qualified as exploratory research. Exploratory research is considered in this study, as preliminary research on a subject that has been not investigated before (Stebbins, 2001). Exploratory research uncovers initial data on which future research can build upon (Stebbins, 2001).

Quantitative research best fits this subject because there has been hardly any research done about how outdoor enthusiasts acquire information about their activities through social media. Furthermore, considering the very limited amount of research done on the subject, it is pertinent to first gather empirical data on the topic before conducting more nuanced and elaborate qualitative studies on the subject. By providing quantitative evidence of how outdoor enthusiasts use social media to learn about their outdoor activities, we hope this research can serve as a building block to further studies. We added a few qualitative questions to this research in order for participants to provide additional and more diverse answers (Reja et al., 2003).

4.2 Methods and instrument

The instrument in this research is a survey that was developed according to the general principles and ideas of survey design discussed by Oppenheim (2000) and Vanette & Krosnick (2017). Considering that this online survey pertains to the subject of social media, the survey was developed using the principles presented in Wilson's book *The Handbook of Online and Social Media Research* (Wilson, 2011). Furthermore, this survey was inspired by other survey-based studies that look into how users seek information about a specific subject on social media (Chung & Koo, 2015; Moll & Nielsen, 2017; Pabel & Prideaux, 2016; Zucco et al., 2018) as well as other survey-based studies focusing on the links between the outdoors and the use of technology (Bolliger et al., 2021). An example of one these surveys can be found in the appendix of this document (see Annexe C).

4.2.1 Social media platforms considered

The main social media platforms that belong to the "social networking sites" category (Quan-Haase & Sloan, 2022) that were considered when developing this survey are Facebook and Reddit. The main social media platforms in the "social media sharing" category (Quan-Haase & Sloan, 2022) that were considered were Instagram, TikTok, Reddit and YouTube. These social media platforms were selected based on two factors: peer-reviewed research done about social media use relating to outdoor activities and our own experience using social media as an outdoor enthusiast to gain information about outdoor activities. It is important to note that due to the exploratory nature of this research, the option "other" was present in questions that ask participants to select social media platforms used for specific tasks.

4.2.2 Survey structure

The answers to this survey were mainly categorical. The survey contains 35 questions and takes roughly 20 minutes. The survey was designed to maximize participation and recruit as many participants as possible. The type of responses were mixed and adapted to each question and include single and multiple choice questions as well as Likert scale ratings. The survey contained four open-ended questions to allow participants to explain their answers and give examples.

The survey was divided into the following six sections:

Section 1- Information and consent: This section contained information regarding the research and consent

Section 2- Admissibility: This section contained a few questions regarding participants' admissibility (over 18, a Canadian resident and practicing at least one form of outdoor activity once a year)

Section 3- General Information: This section contained questions regarding general information concerning the participant (age, outdoor activities practiced, level of outdoor expertise which was self-reported, etc.)

Section 4- Using social media to learn about outdoor activities general questions: This section contained questions with specific categorical answer options and was divided into two types of questions: "yes" or "no" questions and questions that are answered with a Likert-scale (answers

ranging from 1) strongly disagree to 5) strongly agree). A Likert-scale with 5 points was selected as it is the number of points most commonly favoured in research (Joshi et al., 2015).

Section 5- Types of content consulted relating to skills: Because the topic of this study was originally centered mainly around outdoor enthusiasts using social media as a learning resource to acquire knowledge about hard skills, this section contained questions related to specific skills (mainly hard skills) relating to outdoor activities. The questions in this section could be answered with a five-point Likert scale. The skills discussed pertained to one of the three categories of hard skills: safety skills, technical skills and/or environmental skills, as discussed by Priest and Gass (Priest & Gass, 2018). More precisely based on the hard skills discussed by Priest and Gass and Wagstaff and Attarian, the specific competencies associated with each category that were investigated in this section are detailed in the table that is included in the theoretical framework section (Attarian et al., 2009; Martin et al., 2017; Priest & Gass, 2018).

Section 6- Draw entry: This section allowed participants to leave an email address to be eligible to win a prize.

Please see Appendix E to view the complete survey.

4.3 Data collection

The data was collected through a survey housed on Lime Survey. Before obtaining an official ethics approval (See Appendix G for the official ethics certificate), two pretests of the survey were conducted. First, to validate the content of the survey, a pretest of the survey was done by content and survey experts. Then, to validate the comprehension of the survey, five nonparticipant outdoor enthusiasts who use social media to learn about their activities corroborated the survey. These five outdoor enthusiasts were recruited through snowballing. Following this step, the survey was published on Facebook outdoor enthusiast groups (See Appendix A to read the post that introduced the survey). Facebook groups about outdoor enthusiasts that cover a wide array of outdoor activities were selected, including hiking, canoeing, kayaking, rock-climbing, backcountry skiing and cross-country skiing. The reason that these disciplines were selected is that they are the outdoor activities with the most active Facebook groups. We also considered the number of members of these groups and prioritized the groups with the most members. To recruit participants from a wide array of provinces, we hoped to publish on six outdoor enthusiasts' Facebook groups per Canadian province, one outdoor group about each outdoor discipline identified, but we were not able to do so for all provinces and territories, because some of them, mostly the least populated provinces and territories, did

not have six outdoor activities Facebook groups relating to the disciplines identified. It is also important to note that all the Facebook groups selected were independent non-formal groups, meaning no Facebook group run by an organization or business was be included. Furthermore, considering that Canada is a bilingual country, this survey was available in English and French.

Below is a summary of the table representing the Facebook groups where participants were recruited per the principles established here above. This summarized table presents each province and the type of outdoor activity relating to the Facebook groups that was identified. The fully detailed version of this table can be found in Appendix D.

Table 3. Summary of Facebook groups' types of outdoor activities per province

Province of Facebook Group	Outdoor discipline
Alberta	Hiking/Backpacking
	Kayaking
	Backcountry skiing
	Cross-country skiing
British Columbia	Hiking/Backpacking
	Rockclimbing
	Canoeing
	Kayaking
	Backcountry skiing
Manitoba	Hiking/Backpacking
	Canoeing
	Kayaking
	Cross-country skiing
New Brunswick	Hiking/Backpacking
	Rockclimbing
	Canoeing
	Kayaking
	Cross-country skiing
	Other: camping
Newfoundland and Labrador	Hiking/Backpacking
	Rockclimbing
	Canoeing

	Kayaking
	Cross-country skiing
Northwest Territories	Others: outdoors general
Nova Scotia	Hiking/Backpacking
	Rockclimbing
	Canoeing
	Kayaking
	Other: camping
Nunavut	Cross-country skiing
Ontario	Hiking/Backpacking
	Rockclimbing
	Canoeing
	Kayaking
Prince Edward Island	Hiking/Backpacking
Quebec	Hiking/Backpacking
	Canoeing
	Kayaking
	Rockclimbing
	Backountry skiing
	Cross-country skiing
Saskatchewan	Hiking/Backpacking
	Canoeing
	Kayaking
	Other: outdoor enthusiasts
Yukon	Hiking/Backpacking
	Canoeing
	Kayaking
	Rockclimbing
	Backcountry skiing
	Cross-country skiing

4.3.1 Notes on groups targeted

The following paragraphs define certain observations and precisions that came up when conducting the selection of Facebook groups following the principles previously established.

First, it is important to note that although we managed to identify at least one outdoor group per province, we did not manage to identify one Facebook group per discipline per province. Some of the provinces, only had one encompassing outdoor activities Facebook group. For example, the Northwest Territories only had one outdoor pursuit Facebook group entitled: Northwest Territories Outside. Second, if a province did not have one Facebook group per every discipline, but one specific Facebook group related to outdoor activities kept coming up in our research, then we included it. For instance, Nova Scotia has a Facebook group entitled *Camping in Nova Scotia*, with 28.6k members that kept coming up when researching every outdoor discipline. Hence, it was included in the Facebook groups targeted. Third, if two Facebook groups about one discipline and province had a similar number of members then the Facebook group that focused on information sharing versus picture sharing was prioritized. For example, the group *Kayak au Quebec* was included instead of *Kayak Quebec* because it possessed a similar number of members, but in the group description it mentions focusing on information sharing; whereas *Kayak Quebec* seemed to center more around sharing pictures (see Figures 11 and 12). Fourth, it is interesting to point out that Quebec was the province with the most outdoor activities Facebook groups and the most members, despite not being the most populated province (Statistics Canada). Finally, hiking Facebook groups were by far the groups with the most members, this might suggest that hiking is the most popular outdoor activity in Canada, although future research must be conducted on the subject to validate this hypothesis.

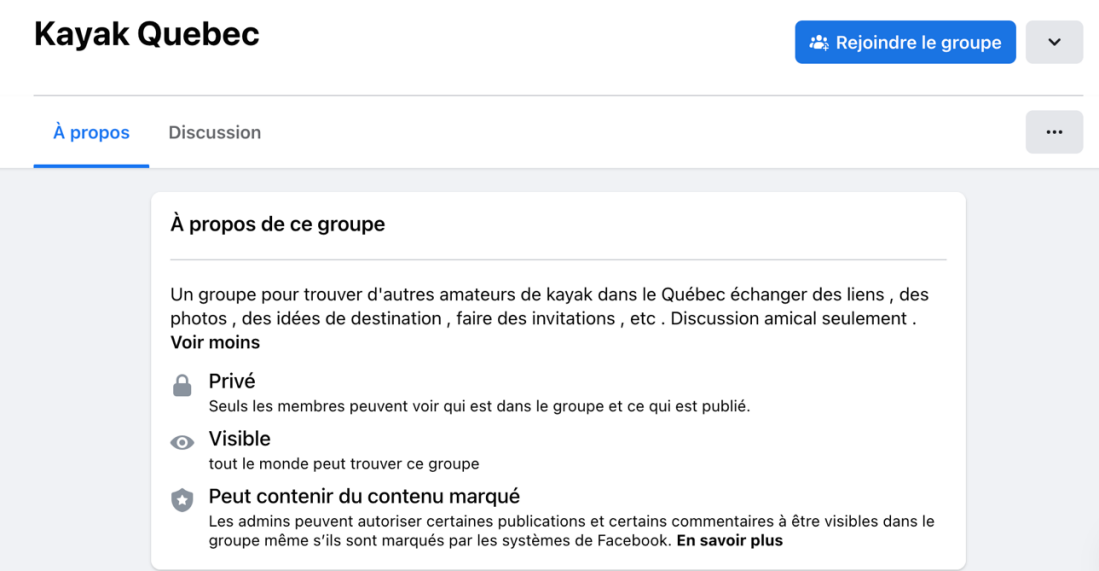

Figure 10. Description of Kayak Quebec Facebook Group

Figure 11. Description of Kayak au Quebec Facebook Group

4.3.2 Sampling

Any adult (person over the age of 18 years old) who practices at least one outdoor activity, uses social media and is a Canadian resident could answer our survey. We hoped to have participants from every province and territory participate in our study. Data collection was anonymous, and we attempted to recruit as many participants as possible by advising potential participants that they would be eligible to win a 100$ Mountain

Equipment coop gift certificate if they participate (See Appendix A). We hoped to recruit participants of a wide array of ages, outdoor levels of expertise, provinces of residence and outdoor disciplines practiced.

4.4 Data analysis

The data for this research was analyzed through SPSS version 28. The data generated by the survey was imported to excel and then into SPSS. After numerically coding our variables, range checks for each variable was run to correct any potential errors (Oppenheim, 2000). We disregarded data from individuals who did not correctly answer the verification question (participants were asked to select a specific answer for one of the questions). We first analyzed *univariates*, meaning we looked at specific variables individually; before focusing on *bivariates,* that is to say, the association between variables (Oppenheim, 2000). In the study of *bivariates*, chi-square tests and t-tests were applied to explore relationships between participant's age, province of residence and whether or not they practice an outdoor activity and the answers to the six following questions:

1. Do you use social media to learn or acquire information about your outdoor activities?

2. Do you follow outdoor influencers that post content about outdoor activities?

3. Does the content posted by these influencers help you learn or acquire information about your outdoor activities?

4. Do you follow outdoor organizations on social media (ex. Parcs Canada, Leave No Trace, Paddle Canada)?

5. Does the content posted by these organizations help you learn or acquire information about your outdoor activities?

6. Do you ever face challenges associated with searching for information or learning about outdoor activities on social media platforms?

The frequency, distribution, mode, median and standard deviation of the variables was also analyzed.

4.5 Validity and limitations

To ascertain the validity of the data and because data is only collected from one source (the survey), we hoped to have as many respondents and hopefully as much diversity as possible regarding the respondents' age, province of origin, level of outdoor competency and disciplines practiced. As previously mentioned, this survey was rooted in principles developed in previous studies and was tested before being published.

When analyzing and presenting our data, we considered positionality and biases and acknowledge how they affected the data collection.

Some limitations of this study need to be pointed out. First, participants were only recruited via Facebook. Hence, outdoor enthusiasts who use social media, but do not use Facebook, were not questioned in this survey. Second, participants were recruited via Facebook groups pertaining to six outdoor disciplines. Hence, outdoor enthusiasts that were members of Facebook groups pertaining to other outdoor disciplines were not solicited. By recruiting participants only through Facebook groups pertaining to six outdoor disciplines, we did not collect certain data that might have influenced this study. For instance, an outdoor enthusiast who practices mountain biking avidly and only uses TikTok as a social media platform could not have been included in this study. Regarding the data analysis, a limitation we encountered with the qualitative data was the use of an anonymous survey, which rendered it unfeasible to reach out to the study participants for additional clarification on their responses. It would be interesting for future research to investigate whether gender influences how outdoor enthusiasts use social media to learn about their activities.

CHAPTER 5
ARTICLE

5.1 Abstract

Outdoor enthusiasts can acquire knowledge and skills about their activities in different ways, one of these being social media. Nonetheless, there is limited scientific literature that allows us to understand how outdoor enthusiasts currently use social media to learn about their activities. This exploratory research, based on a mixed methods design aims to better understand how Canadian outdoor enthusiasts (COE) use social media to learn about their outdoor activities. This study examined how 368 COE use social media to learn about their activities. Khi-square tests and t-tests were applied to analyze differences between participants answers and individual characteristics. Results suggest that COE do indeed use social media to learn about their activities. Qualitative data originating from the same survey suggests that COE also use social media to get ideas and inspiration as well as to connect with other outdoor enthusiasts.

Keywords: outdoor activities; social media; outdoor enthusiasts; informal learning; skills

5.2 Introduction

Since the birth and development of the Romantic movement in Europe during the eighteenth and nineteenth centuries, the outdoors has been considered a place to "disconnect" from modern society (Nash, 2014; Payne & Wattchow, 2008). Today, it is very difficult to “disconnect” completely while being outdoors, as human-technology entanglements are present in all spheres of our lives (Frauenberger, 2019). For instance, technology is now often part of our outdoor experiences (Bolliger et al., 2021; Jukes & Lynch, 2024). On the one hand, technological devices are used during outdoor activities for safety and informational purposes, for example, the integrated GPS or weather utilities (Hills, 2019). Some research investigates the various advantages and disadvantages of integrating technology for such practical purposes to outdoor experiences (Cuthbertson et al., 2004; Hills, 2019; Shultis, 2012a; van Kraalingen, 2021). On the other hand, these devices are also used to connect with other outdoor enthusiasts and to share pictures about outdoor experiences (Arts, 2021). These online connections most often take place on social media platforms such as Facebook or Instagram (Arts, 2021). Outdoor enthusiasts can not only use these platforms to create a “sense of virtual community” (Kotut et al., 2020), but they can also acquire knowledge and information about their outdoor activities (Innocenti et al., 2022).

Although there is a plethora of outdoor virtual communities and countless posts about the outdoors on social media, very little research investigates how outdoor enthusiasts use social media to learn about their outdoor activities. This research aims to fill this gap in the literature and serves as a building foundation for future research on this question. It helps explain how outdoor enthusiasts use social media to plan their activities by adopting the following three theoretical models: Connectivism (Siemens, 2004), The Brick Wall Model of Core Competencies for Effective Outdoor Leadership (Priest & Gass, 2018) and the SOMA model (Legendre, 2005) and proposes a model that can be used for research focussed on learning about outdoor activities on social media.

While the focus of this research is to explore how outdoor enthusiasts use social media as a learning resource, it is essential to recognize the broader context in which this knowledge is applied. As the number of Canadians engaging in outdoor activities continues to rise (Statistics Canada, 2021), understanding how they acquire and utilize this information becomes increasingly pertinent. The most recent Canadian Household and Environment survey shows that 77% of households have at least one person participating in outdoor activities close to home, up from 72% reported in 2016 (Statistics Canada, 2021). This increase in the practice of outdoor activities can also be noted in Parks Canada visitor attendance statistics: from 2019 to 2020 attendance grew by 2% (Government of Canada, 2020).

Because the popularity of outdoor activities is growing in Canada, so is the need to develop skills and competencies relating to these activities. One can justify the importance of developing these skills by pointing to the rising incidence of accidents and injuries during the practice of outdoor activities (Castonguay, 2016; Cockrell & LaFollette, 1985; Priest, 1987; Réseau de plein air Québec, 2023). For instance data from *Sureté du Québec* (2022), Québec's national police force, shows that between 2010 and 2021 rescue missions by helicopter increased by 50% for land operations and 80% for water operations.

There are many avenues by which Canadian outdoor enthusiasts can acquire information about their activities. First, Canadians can turn to official provincial and federal outdoor organizations which can either be privately run and operated or mandated by government bodies both national and provincial (Bergeron et al., 2022; Jensen & Guthrie, 2006; Outdoor Council of Canada, 2023). These national and provincial organizations offer certifications and courses that allow outdoor enthusiasts to acquire skills relating to specific outdoor disciplines. Second, outdoor enthusiasts can also acquire knowledge about outdoor activities by participating in various outdoor programs as a child or teenager, such as attending summer camps (Bialeschki, 2015; Mercure, 2022, 2023). Many of Canada's numerous summer camps offer adventure activities that allow children and teenagers to learn how to practice certain outdoor activities such

as canoeing, sailing, canoeing and hiking or acquire other skills such as leadership skills and social skills (Henderson & Potter, 2001; Mercure, 2023). Children, teenagers, and adults can also acquire skills relating to outdoor activities by attending outdoor education programs (O'Farrell & Liu, 2020) and through various outdoor organizations such as Scouts Canada (Gravelle & Deschênes, 2004; Mercure, 2022, 2023). Third, outdoor enthusiasts often greatly develop their skills through commercialized activities: adventure tourism or nature tourism (Beedie & Hudson, 2003). Finally, outdoor enthusiasts can acquire knowledge through informal learning. It is very important to investigate how outdoor enthusiasts learn about their activities in this way because this type of learning is increasingly a part of knowledge acquisition in the modern education landscape (Ayu, 2020; Picciano et al., 2010; Siemens, 2004).

As a case in point, Jeffs & Ord (2017) argue that informal learning can enhance outdoor education while insisting that research on informal outdoor education is lacking and needs to be further investigated. To this day, there has been limited research that explores how informal learning is integrated into outdoor education settings. For instance, Hovardas (2016) argues that primary teachers who incorporate outdoor education into their curriculum often rely on their peers to acquire information.

5.3 Literature review

5.3.1 Using social media to search for information

Numerous studies investigate how social media is used to search for information about a specific topic. During our literature review, we found that research centered around using social media for information gathering is most developed in the following domains: tourism, health, and politics (Cheston et al., 2013; Hashim et al., 2018; Rehm et al., 2019; Selwyn, 2012). There is much research already that discusses how the use of social media to search for travel information has altered the tourism industry (Chung & Koo, 2015; Xiang & Gretzel, 2010). Indeed, information searching on social media helps travellers not only plan their very own trips but be inspired by others' travels (Chung & Koo, 2015; Hur et al., 2017; Tussyadiah & Fesenmaier, 2009). One of the main challenges that users face when information seeking through social media related to their travels is the determination of information reliability and credibility (Zeng & Gerritsen, 2014).

5.3.2 Learning about outdoor activities through social media

As previously noted, outdoor enthusiasts can acquire knowledge both through formal and informal educational endeavours. Today, one of the common ways that informal learning occurs is through the use

social media (Guerin et al., 2020). In this study we define social media as a variety of online platforms (Aichner et al., 2021) that allow "individuals, communities, and organizations to interact with one another by providing a service that enables them to communicate and collaborate and to create, modify, and share content" (Quan-Haase & Sloan, 2022, p. 14).

As the Canadian Internet Survey reported, more than three-quarters of Canadians used social media to look up information in 2020 (Statistics Canada, 2020). The Canadian Nature survey showed that "watching visual media" and "reading posts" are the two ways that Canadians most frequently obtain information about nature, including outdoor activities (Federal and Provincial Territorial Governments of Canada, 2014, p. 62).

Although there has been very little research done on the matter, we suggest that outdoor enthusiasts use social media to learn about their activities for four main reasons. First, as previously mentioned, social media is widely used for information-seeking and self-education (Ahmed et al., 2019; Hamid et al., 2016; Smith, A. et al., 2011; Zhao & Zhang, 2017). Second, technology and social media are increasingly a part of outdoor experiences (Hills, 2019; Reed, J. et al., 2024). Third, as demonstrated in the 2012 Canadian Nature Survey, the two leading ways that outdoor enthusiasts most use to acquire information about nature (including outdoor activities) are by watching visual media and reading publications (Federal and Provincial Territorial Governments of Canada, 2014). Visual media and publications are both some of the main types of content that can be consulted on social media. Fourth, there exists a plethora of educational content relating to outdoor activities on social media. This educational content is present across social media platforms and can be found in various forms, such as posts, videos, and forums. Official Canadian outdoor organizations, professional guides, and amateur outdoor enthusiasts all share educational content about their activities on social media.

5.3.3 Digital technology and the outdoors in the literature

Research on the relationship between social media and outdoor activities is a relatively new field, with a limited number of existing studies. However, there are several studies that examine the use of smartphones in outdoor contexts. These studies consider all the functionalities present on smartphones such as text messaging, phone calls and social media (Bolliger et al., 2021).

A few studies consider how images of nature are shared on social media. For example, the concept of *Nature 2.0*, coined by Büscher (2016), identifies the relations between new media and nature conservation. Two studies investigate how outdoor enthusiasts connect with other enthusiasts through social media. These

studies conclude that an internet forum specialized in an outdoor discipline can allow users to share skills in a creative, collaborative and free manner (Boutroy, 2022; Kotut et al., 2020).

Most studies in this field seek to examine the effects of integrating digital technology during outdoor experimental learning experiences. Two systematic reviews of literature have been conducted on this theme. Hills & Thomas (2019) propose a framework for integrating technology into outdoor experimental learning. Van Kraalingen (2021) also carried out a systematic review of studies that relates to the subject of technology in outdoor learning contexts, but they focussed on mobile media, defined as "any electronic, wireless, handheld device that can serve as a tool for cellular communication, the documentation of information and provides access to online resources" (p.204).

In the context of the speed at which social media evolves (Chugh & Joshi, 2020), it is also important to highlight research that centers around ways that social media has recently changed. North *& al.* (2024) explain how artificial intelligence (AI) can shift the way outdoor enthusiasts learn about their activities as they can access content that takes into account their skill levels, preferences and goals. AI can therefore have a "transformative potential" in outdoor learning as it can potentially improve skill learning and safety. Moreover, Priest (2024) argues that the metaverse, meaning the "internet based and simulated 3-D digital world where users interact and immerse themselves in this replicated setting" (Priest, 2024, p. 21), provides opportunities for learning about outdoor activities. For example, an outdoor enthusiast who wishes to practice motoric skills relating to an activity could do so in a 3-D digital world.

5.4 Conceptual framework

This study uses three theoretical frameworks: the connectivism learning theory (Siemens, 2004), the brick wall model for core competencies in outdoor leadership (Priest & Gass, 2018) and the SOMA (subject, object, milieu and agent) model (Legendre, 2005). Because there are currently no learning theories that directly pertain to the subject of learning about outdoor activities on social media, this study links these three conceptual models together and proposes an adaptation of them to learning about outdoor activities on social media.

5.4.1 Connectivism

Connectivism is a learning theory developed by Siemens (2004) to create a model adapted to the era of technology. Corbett & Spinello (2020) define it as "the nexus between human learning and the ubiquitous access to knowledge by the current technological environment" (p.3). This learning theory places technology at the center of learning and posits that informal learning that takes place on technological devices is an integral part of learning and knowledge-sharing (Siemens, 2004). Connectivism is also rooted in the idea that learning takes place through connections and the creation of online networks (Siemens, 2004).

Connectivism applies to learning about outdoor activities through social media, as outdoor enthusiasts acquire knowledge through technology in an informal and self-directed manner. This learning does not take place at a specific given pace, such as during a physical in-person outdoor course, but rather through "interactions between, individuals, societies, organizations, and the technologies that link them" (Goldie, 2016). Outdoor organizations, professional outdoor leaders, influencers who post content about outdoor activities and outdoor enthusiasts can all learn about their activities through social media. Hence, this learning can be seen as collaborative and based on online connections between these various social media users (Goldie, 2016). This research considers that knowledge about outdoor activities does not solely reside in fixed locations, people, or objects, but can also be distributed across online networks, such as social media. The importance of networked spaces is an integral part of connectivism (Siemens, 2004), and as van Kraaligen et al.(2022) explain "networked spaces and connectivity play a critical role in and beyond outdoor education" (p.3).

5.4.2 The brick wall model of core competencies for effective outdoor leadership

Priest & Gass (2018) developed the brick wall model (see Figure 1), which considers the skills necessary for effective outdoor leadership. This model has been widely used in research related to outdoor activities (Hobbs, 2009; Lewis & Kimiecik, 2018; Medina, 2004). Although these skills are related to outdoor leadership, they are also relevant to abilities and skills outdoor enthusiasts require to practice their activities recreationally and unsupervised. These skills are divided into three types: hard skills, soft skills and meta-skills. First, hard skills are solid, tangible, and measurable and refer to technical skills, for example, knowing how to tie different knots, pitching a tent, or navigating with a map and a compass. Priest & Gass (2018) divide hard skills into three categories: technical activity skills, safety and risk skills, and environmental skills. Second, soft skills refer to abilities that are more difficult to evaluate and represent leadership and interpersonal skills. A few examples of soft skills in outdoor leadership include "organization, instruction

and facilitation" (Priest & Gass, 2018). Third, meta-skills, also referred to as conceptual skills or operational skills (Shooter et al., 2009), are skills that overlap with both hard and soft skills. Meta-skills are core competencies that cement hard and soft skills together (Priest & Gass, 2018). Effective communication, professional ethics, problem-solving, decision making and sound judgement are all considered meta skills (Priest & Gass, 2018). Because soft skills and meta-skills are more relevant to the development of competencies for outdoor leaders, and this study pertains to outdoor enthusiasts, this study is mainly focussed on hard skills. This model is useful for outdoor enthusiasts because it can allow them to gain knowledge on the skills that are required to safely and adequately practice their activities.

In outdoor activity settings, hard skills can notably refer to the ability to properly use and select outdoor gear, such as knowing how to navigate using a map and compass (Martin et al., 2017). Martin *& al*. (2017) define hard skills as "proficiency in particular outdoor activities as well as experience-based competence and professional competency" (2017, p. 9). First, proficiency refers to the acquisition of technical skills in a general sense. Second, experience-based competency is the acquisition of technical skills through hands-on outdoor experiences. Third, professional competency indicates the acquisition of hard skills through professional certifications (Martin et al., 2017).

Priest & Gass (2017) divide hard skills into three categories: technical activity skills, safety and risk skills, and environmental skills. There are various competencies that fit into each one of these. First, some of the skills pertaining to safety relate to survival and risk management. Second, outdoor equipment selection and specific technical skills relating to the outdoor activity in question would be a part of the technical skills category. Third, Leave No trace skills and environmentally sustainable choices relating to outdoor activities are clearly environmental skills (Attarian et al., 2009; Martin et al., 2017; Priest & Gass, 2018).

Figure 12. The brick wall model of core competencies for effective outdoor leadership (Priest & Gass, 2018)

5.4.3 The SOMA model

Legendre (2005) developed the SOMA (subject, object, milieu and agent) model and describes the relationships between the agent (A) or the resources, the subject/learner (S) and the content (O). In Legendre's model, the "milieu" or the setting (M) in which the learning takes place is also important (2005).

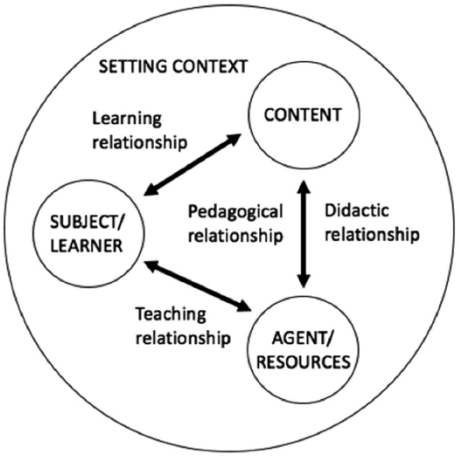

Figure 13. Legendre's SOMA model (2005), translated by Beauchamp & al. (2022)

Legendre's model also proposes four different types of relationships between these four elements. First, there is the *didactic relationship* which refers to the relationship between the agent and the object. Second, there is the *learning relationship* that explains the relationship between the subject and the object. Third, the *teaching relationship* invokes the relationship between the agent and the subject. Fourth, the *pedagogical relationship* refers to the relationship between the subject, the object, and the agent.

In this study, the *learning relationship* is the most important relationship. Even though as previously established learning through social media primarily takes place in an informal manner, this relationship is, in relation to our study, the links between the outdoor enthusiast who is using social media and the educational content about outdoor activities present on social media. This relationship pertains directly to our research question that looks at how outdoor enthusiasts use social media to learn about their outdoor activities.

5.4.4 Didactic framework for learning about outdoor activities through social media

Numerous studies have adapted and applied Legendre's SOMA model to various fields. For example, Germain adapted the model to propose a conceptual framework for language didactics (Germain, 1989; Gut, 2014), while Allard & Boucher adapted the SOMA model for learning in museums (Allard & Boucher, 1998). Huebner, basing herself on Allard & Boucher's adaptation, demonstrated how the SOMA model could be applied to museum education through social media (Huebner, Emma 2022). Finally, Beauchamp et al. (2022) applied SOMA's model to outdoor education.

The following presents our own adaptation of the SOMA model (Legendre, 2005) applied to learning about outdoor activities through social media. This adaptation which is based on previous applications of the SOMA model is notably also influenced by connectivism (Siemens, 2004) and the brick wall model of core competencies for effective outdoor leadership (Priest & Gass, 2018). This model has not been tested and validated yet, and as a result it has limitations. Nonetheless, it is presented to help the reader better understand the different actors and relationships present in the context of learning about outdoor activities through social media.

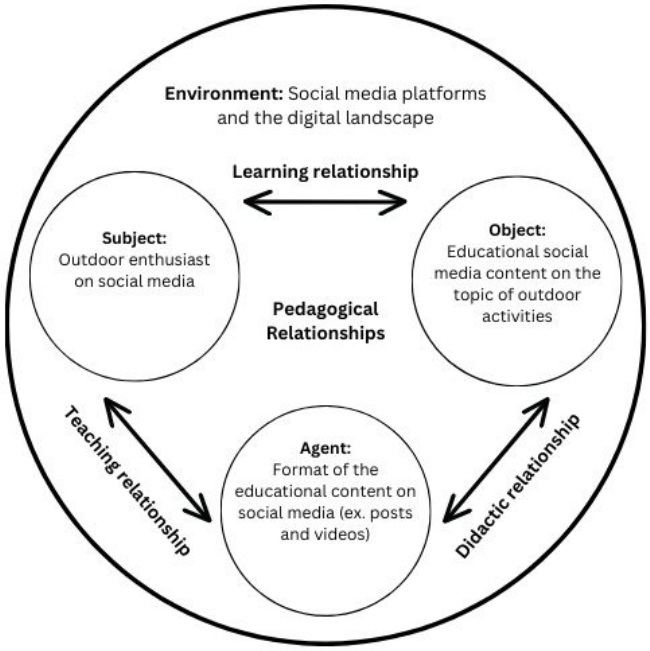

Figure 15. SOMA Model adapted to learning about outdoor activities on social media

1. The subject (S): The subject is the learner. In terms of learning about outdoor activities through social media, the subject refers to the social media user. More particularly, in this case, the subject refers to the outdoor enthusiast who is using social media.
2. The object (O): The object refers to the learning objective or the subject matter, i.e what is being learned. In the context of learning about outdoor activities through social media the object is the knowledge related to the outdoor activities that are attempted to be transmitted via social media.
3. The environment or "milieu" (M) refers to the educational environment or setting and encompasses the human, material, or natural surroundings where the learning activities occur. In the context of learning about outdoor activities through social media, the environment refers to social media

platforms and the technological environment according to Siemens (Huebner, Emma 2022; Huebner, 2023).

4. Agent (A): The agent (A) comprises the human, technical, pedagogical, and material resources that are utilized to facilitate the pedagogical relationship and promote the acquisition of the subject material (the object) (Beauchamp et al., 2022; Germain, 1989; Legendre, 2005). In this model, the agent refers to the format of the educational content on social media, for instance posts and videos; an agent is a resource (material or pedagogical) offered to a learner (subject) in a learning situation (Legendre, 2005, p. 34). For example, users of social media platforms can learn about a specific notion by looking and listening to the content in posts and videos found on social media platforms (Gómez-Ortiz et al., 2023). Traditionally the agent also refers to the teacher; however, in the context of learning through social media there is no official "teacher". It is important to note that in previous research that uses the SOMA model applied to learning through social media, content creators have been defined as the agents (Huebner, 2023). Hence, although this model opts to define the "agent" as the format of the educational content, the agent could also refer to content creators. In the context of learning about outdoor activities through social media, these content creators could be for example ordinary outdoor enthusiasts, outdoor professionals (for example guides), influencers or outdoor organizations.

5.5 Methods

5.5.1 Purpose and research questions

The question that guided this study is: how do Canadian outdoor enthusiasts use social media to learn about their outdoor activities? This study also seeks to discover whether individual characteristics influence responses by examining how the respondents' age, disciplines practiced, and level of outdoor expertise influence how they use social media to learn about outdoor activities.

5.5.2 Methodology

Canadian outdoor enthusiasts aged 18 years old and above who use social media and practice at least one outdoor activity once a year were invited to participate in this study in October 2023. The participants were recruited on Canadian Facebook outdoor enthusiasts' groups pertaining to the five following disciplines: hiking, canoeing, kayaking, rock-climbing, backcountry skiing and cross-country skiing. These social media platforms were selected based on three factors: the prevalence of practice of these activities in Canada (Gouvernement du Québec, 2017; Statistics Canada, 2018), our desire to include an array of types of outdoor activities including aquatic outdoor activities and winter sports in order to paint a comprehensive picture of

outdoor enthusiasts in Canada and our own experience using social media. For instance, we reflected on how we have previously used social media to seek advice on backcountry routes and acquire specific information related to outdoor activities. The Facebook groups that were targeted for recruitment were specific to each province and groups with the most members were prioritized.

5.5.3 Instrument and data collection

The instrument used in this study is a mixed-methods survey developed according to the general principles and ideas of survey design discussed by Oppenheim (2000) and Vanette & Krosnick (2017). Since this online survey is related to social media, we also based its development on the principles presented by Poynter (2010), particularly paying attention the crucial factors for designing an effective online survey. Furthermore, this survey was inspired by other survey-based studies that look into how users seek information about a specific subject on social media (Chung & Koo, 2015; Moll & Nielsen, 2017; Pabel & Prideaux, 2016; Zucco et al., 2018) as well as other survey-based studies focussing on the links between the outdoors and the use of technology (Bolliger et al., 2021). Two pretests of the survey took place to validate it: one with expert scholars in the outdoor field and one with five outdoor enthusiasts who were recruited through snowballing.

The final version of the survey was housed on *Limesurvey* and included the following six different sections: inclusion criteria, general questions, using social media to learn about outdoor activities, types of content viewed on social media relating to outdoor activities, and a section that let participants leave an email address to be eligible for a draw entry. The survey included an array of questions: yes/no questions, ranking questions, and Likert-type questions (See survey in Appendix A). Furthermore, the survey had five open ended questions that allowed participants to provide more in-depth answers to their individual responses. Although the survey was designed to be mainly a quantitative study, some of the questions were qualitative and designed to gather more nuanced and detailed data.

5.5.4 Data analysis

The study's validity was enhanced by employing triangulation, which involved incorporating both quantitative and qualitative survey questions, along with conducting a comprehensive literature review (Merriam & Tisdell, 2016). Quantitative data was analyzed through SPSS 28.0. We first conducted descriptive statistics to generate frequencies before applying independent sample *t* tests and chi-square tests to ascertain differences in responses based on the following individual characteristics: age, province of residence and outdoor activities practiced.

Nvivo 12 was used to conduct the inductive analysis of the qualitative data. After two thorough read throughs of the data, the qualitative data was then descriptively coded in Nvivo before being organized into emerging themes (Arthur et al., 2021). First, we began by organizing participants' responses into broad general nodes to capture overarching patterns in the data. Next, we delved deeper by breaking these large themes into smaller, more specific sub-categories (sub-nodes) to gain a finer understanding of the nuances within each theme. Throughout this categorization process, we carefully considered synonyms and related terms to ensure that our grouping accurately reflected the diversity of responses and captured all relevant aspects of the participants' answers.

The quantitative and qualitative data were analyzed in a convergent manner (Moseholm & Fetters, 2017). Qualitative data helped to provide explanations for some of the quantitative data found. In the discussion section, we explain how this data comes together.

5.6 Sampling

5.7 Results

5.7.1 Demographic Data

A total of 525 individuals answered the survey. To make sure that participants were reading the questions and not just randomly selecting answers, we included two questions in the survey where participants were asked to click on a specific answer. After cleaning the data and removing incomplete entries and participants who failed to correctly answer the test questions, 368 respondents were left. Participants' ages ranged from 18 years old to 76 and the final sample was of an average age of 41.6. 42.9% of respondents indicated that they were higher education students. We had respondents from every province and territory of Canada. Nonetheless, for statistical analysis purposes, considering that several provinces and territories had very few participants, some of the provinces and territories were grouped into categories; the percentage and number of each participant are detailed in Table 4.

Table 3. Province groups (N=368)

Province Group	Number	Percentage
Prairies (Alberta, Saskatchewan, Manitoba)	98	26.6%
Atlantic provinces (Prince Edward Island, New Brunswick, Nova	67	18.2%

Scotia, Newfoundland and Labrador)		
Québec	53	14.4%
Northern provinces and territories (Yukon, Nunavut, Northwest Territories)	37	10.1%
Ontario	49	13.3%
British Columbia	64	17.4%

The average level of expertise in the outdoor activities targeted by this survey is detailed in Table 2. It is important to note that participants were also asked if they practiced any other outdoor activities than those listed in the survey which were hiking, rock-climbing, canoeing, kayaking, backcountry skiing and cross-country skiing. The most common responses of other outdoor activities practiced by participants are as follows: snowshoeing, biking (road and mountain), trail running, downhill skiing and snowboarding, paddle boarding, ice skating, packrafting.

Table 4. Participants level of expertise according to outdoor activity (N=368)

Outdoor Activity	Level of expertise	Percentage
Hiking	Beginner	6.8%
	Intermediate	44.0%
	Advanced	35.6%
	Expert	12.2%
	Does not practice this activity	1.4%
Rock-climbing	Beginner	18.2%
	Intermediate	18.5%
	Advanced	12.2%
	Expert	3.3%
	Does not practice this activity	47.8%
Canoeing	Beginner	24.2%
	Intermediate	29.3%
	Advanced	15.2%
	Expert	6.3%

	Does not practice this activity	25.0%
Kayaking	Beginner	31.8%
	Intermediate	35.3%
	Advanced	10.9%
	Expert	1.9%
	Does not practice this activity	20.0%
Backcountry skiing	Beginner	13.0%
	Intermediate	11.4%
	Advanced	11.1%
	Expert	4.3%
	Does not practice this activity	60.1%
Cross-country skiing	Beginner	21.7%
	Intermediate	26.9%
	Advanced	14.4%
	Expert	3.5%
	Does not practice this activity	33.4%

5.8 Results

5.8.1 Using social media to learn about outdoor activities

A percentage of 95.9% of participants reported that they did use social media platforms to learn or acquire information about outdoor activities. Participants were asked to answer 15 Likert-type items on a 5-point scale ranging from 1-strongly disagree to 5-strongly agree. Very few participants indicated 'strongly disagree' or 'strongly agree'. We therefore merged the categories 'strongly disagree' and 'disagree', and 'strongly agree' and 'agree', to facilitate comparison and contextualization of results. Those results can be found in Table 4. In terms of checking for the reliability of information found on social media regarding outdoor activities, 74.5% of participants reported they double checked that the information they were consulting on social media about outdoor activities was accurate before using it and that they were more likely to trust information that outdoor organizations share over information shared by influencers. Concerning the acquisition of hard skills (Priest & Gass, 2018), most participants either agreed or strongly agreed that social media helped them learn about technical skills relating to their activities. The three skills

that participants reported most using social media to learn about are outdoor gear or equipment choices (79.6% either agreed or strongly agreed), using social media to learn about routes and itineraries (75.5% either agreed or strongly agreed) and using social media to help them plan their outdoor activities (74.5% either agreed or strongly agreed).

Table 5. Results of 15 Likert-type items pertaining to how COE use social media to learn about their activities (N=368)

Item	Percentage		
	SD/D	N	A/SA
I use social media to learn about the outdoor activities that I practice	7.3	31	84.2
I use social media to look up videos about the outdoor activities that I practice	21.7	16.0	62.2
I use social media to ask questions about the outdoor activities that I practice	21.2	21.7	57.1
My social media feed shows me educational content related to the outdoor activities that I practice	14.4	16.8	68.8
I double check that the information that I'm consulting on social media about outdoor activities is accurate before using it	9.2	12.0	74.5
I am more likely to trust information that is shared by outdoor organizations over information shared by influencers	5.4	20.1	74.5
I use social media to learn about environmentally sustainable actions	26.6	29.3	44.0

relating to the outdoor activities that I practice			
The information I find on social media helps me to practice my outdoor activities	4.3	14.7	81.0
I use social media to help me plan my outdoor activities	11.7	13.9	74.5
I use social media to learn about routes and itineraries	11.7	12.8	75.5
I use social media to learn about outdoor survival skills	38.9	22.8	38.3
I use social media to learn about outdoor gear or equipment choices	10.1	10.3	79.6

5.8.2 Ranking questions

The survey contained certain ranking-style questions where participants had to rank up to three answer possibilities. The first ranking question asked participants to select up to three resources that they most used when they were trying to search for specific information about an outdoor activity. 91% of participants selected looking up information on the internet as one of their top three actions, 88.2% of participants said that they looked for the information directly where they thought the information was, and 71.3% selected social media as one of the top three resources that they used. In another ranking question, participants selected and ranked up to three actions that most helped them learn or acquire information about outdoor activities. 91.6% of participants selected reading posts (with 45.9% of participants selecting this action as their top choice), 51.8% of participants selected consulting forums, and 44.8% of participants selected looking at pictures.

5.8.3 Differences in responses based on participants individual characteristics

Independent sample *t* tests and *chi*-square tests were applied to discover if there were differences between responses and participants individual characteristics (age, province and whether they practiced an outdoor activity). We applied these tests to the following questions:

1. Do you use social media to learn or acquire information about your outdoor activities?

2. Do you follow outdoor influencers that post content about outdoor activities?

3. Does the content posted by these influencers help you learn or acquire information about your outdoor activities?

4. Do you follow outdoor organizations on social media (ex. Parcs Canada, Leave No Trace, Paddle Canada)?

5. Does the content posted by these organizations help you learn or acquire information about your outdoor activities?

6. Do you ever face challenges associated with searching for information or learning about outdoor activities on social media platforms?

5.8.3.1 Age

Independent sample *t* tests were conducted to ascertain differences in responses by participants according to age. We found no statistical significance between age and whether participants used social media to learn or acquire information about their outdoor activities. We did however find that age influenced in a statistically significant way whether participants followed influencers that post content about outdoor activities. Younger respondents answered more in the positive to the question whether or not they followed influencers that post content about outdoor activities (M=37.98, SD=12.601), and older participants had more of a tendency to answer in the negative to the question (M=45.51, SD=12.962), $t(364)=5.63$, $p<0.001$). We also found a statistically significant relationship between age and whether participants agreed that content posted by influencers helped them to learn or acquire information about their activities. Younger participants had more of a tendency to answer "yes" that this content posted by influencers helped them to practice their activities (M=38.59, SD=13.060), and older participants had more of a tendency to answer "no" (M=43.81, SD=13.060), $t(364)=3.770$, $p<0.01$).

On the one hand, we found no statistically significant relationship between age and whether participants followed official outdoor organizations. On the other hand, we found a statistically significant relationship between age and whether participants agreed that the content posted by outdoor organizations helped them to learn about their activities. Older participants had more of a tendency to answer "yes" that content posted

by outdoor organizations helped them to practice their activities (M=42.47, SD=13.178) and younger participants had more of a tendency to answer "no" (M=39.56, SD=13.429), $t(364)=-1.925$, $p= 0.03$).

We also found that age statistically influenced the way participants responded to the following question: "do you ever face challenges associated with searching for information or learning about outdoor activities on social media platforms?". Older participants had more of a tendency to answer "no" (M=42.90, SD=13.648) the question and younger participants had more of a tendency to answer yes (M=39.89, SD=12.674, $t(364)=2.157$, $p=0.02$).

5.8.3.2 Province

Chi-square tests were applied to analyze the relationship between participants' province of residence and answers to the questions above. We found that there was only a significant relationship between participants province of residence and whether they answered yes or no for only one question: do you use social media to learn or acquire information about your outdoor activities? ($\chi^2= 15.120$, ddl=1, $p=0.01$). Quebec residents had more of a tendency not to use social media to learn or acquire information about their outdoor activities (46.7% answered no to the question) and residents from other provinces had more of a tendency to answer yes to the question.

5.8.3.3 Level of Expertise in outdoor activities

Khi-square tests were applied to analyze the relationship between whether participants practiced an outdoor activity (hiking, rock-climbing, canoeing, kayaking, backcountry skiing and cross-country skiing) and the answers to the questions above. On the one hand, we found no significant relationship between whether participants practiced hiking, kayaking, backcountry skiing and cross-country skiing and their answers to the questions. On the other hand, there was a significant relationship between practicing rock-climbing and the answer to the question: do you follow influencers who post content about outdoor activities? ($\chi^2= 18.993$, ddl=1, $p=<0.001$). Participants who practiced rock-climbing had more of a tendency to follow influencers that post content about outdoor activities (63.2% answered yes) than those who do not practice rock-climbing (36.8% answered yes). Furthermore, there was also a significant relationship between canoeing and the answer to the question: do you follow influencers who post content about outdoor activities? ($\chi^2= 5.237$), ddl=1, $p=0.03$). Participants who practiced canoeing had more of a tendency to follow influencers that post content about outdoor activities (80% answered yes) than those who did not practice canoeing (20% answered yes).

5.8.4 Qualitative data

Participants were asked four medium length to long open-ended questions regarding examples of when they have used social media to learn about their outdoor activities. They were first asked to provide a general example of when they have used social media to learn about their outdoor activities before they were asked if there were any other actions or types of content on social media that were not listed in the categorical questions that helped them learn about outdoor activities. Participants who answered "yes" to whether they followed outdoor organizations and/or outdoor influencers on social media platforms were then subsequently asked to give an example. When analyzing and coding the qualitative data for these questions, we found that the same four themes emerged: trail routes and conditions, ideas and inspiration, connecting with outdoor enthusiasts and technical skills. Table 3 shows quotations associated with these themes. For instance, one participant reported "I organize or participate in outdoor activities with enthusiasts I've met on social media, which allows me to learn skills and get to know mentors more quickly". When analyzing these responses for common themes, we also found that the same four types of social media platforms were mentioned: social networking sites, media-sharing platforms, forums and GPX track-sharing platforms. Table 4 lists examples associated with each one of these types of social media platforms.

It is important to highlight that some differences emerged between respondents' examples of when content posted by influencers versus when outdoor organizations helped them learn about their outdoor activities. On the one hand, the two examples most given regarding when an influencer posted content that helped them learn about outdoor activities pertained to the subject of technical skills (51 references coded) and gear (30 references coded). For example, one participant reported: "I follow an influencer that does a lot of gear tests, so I have those products in mind when the time comes. This is small stuff, like best instant coffee, to larger gear like tents and sleeping pads for multi-day trips." On the other hand, most of the participant examples regarding content posted by outdoor organizations was related to trail routes and conditions (111 references coded). As one participant shared: "Parks Canada and Yukon Conservation society will inform about bear presence or floods on famous hikes for instance."

Table 6. Examples of using social media to learn about outdoor activities

Theme	Common examples	Exemplary quote
Trail routes and conditions	- Getting up to date information about trail conditions	*"I belong to a Facebook group about XC skiing. During the last ski season, I checked others' posts on that site for*

			ideas of trails to ski on and found that the conditions on the Telephone Loop trail at West Bragg Creek were excellent, so I called up a friend and made plans to go XC skiing there."
Ideas and inspiration	-	Getting ideas and inspiration for new places to practice outdoor activities	*"I saw a video of a hike in Vermont on Instagram in feed and then researched whether it was possible for me to do it."*
			"I get ideas about next hikes or bucket list vacation ideas from seeing posts other hikers or kayakers have shown."
Connecting with outdoor enthusiasts	-	Learning about events and meetups	*"I organize or participate in outdoor activities with enthusiasts I've met on social media, which allows me to learn skills and get to know mentors more quickly."*
	-	Connecting with other outdoor enthusiasts who then help learn about outdoor activities	
Technical skills	-	Getting information about gear	*"YouTube as well as Instagram and Facebook reels gave great tips on what to pack and how to pack when we began overnight backpacking. They were also great resources for reviews before buying necessary gear. We also use social media platforms for trip planning."*
	-	Getting information to plan a trip	

Table 7. Types of social media platforms used to learn about outdoor activities

Type of platform	Example of platforms	Exemplary quote
Social networking sites	Facebook	*"For rivers, for example, where I can't find information on specialized sites, I can ask on a canoe Facebook group or the Facebook group of my club if anyone has any info, has already gone down that river, the state of the roads to get there, the access and exit points, the shuttles used, and so on."*
Media sharing platform	Instragram Youtube TikTok	*"Instagram reels and YouTube videos have allowed to get a better idea and gain reviews of hiking trails, camping spots, and crags that I want to visit. I've also learnt rope techniques and tent setups, tips and tricks for outdoor activities through videos."*
Forums	Reddit	*"Participating in forums helps me to challenge my ideas and help develop my opinions and knowledge."*
GPX track sharing platforms	Alltrails, Strava	*"I frequently use the app AllTrails to see up to date trail conditions, find new trails and look at pictures of the location."*

5.8.5 Challenges regarding the use of social media to learn about outdoor activities

43.5% of participants reported that they sometimes faced challenges associated with searching for information or learning about outdoor activities on social media platforms. Participants who answered yes were asked to give an example of a challenge they have faced. Two overarching themes emerged: difficulty finding information and unfriendly encounters online. The following four common reasons why participants had difficulty finding information about their outdoor activities came up: 1) not enough information about certain locations, 2) the information was often not up to date, 3) the information was often unreliable and 4) the information on social media was poorly organized and difficult to sort through. For example, one participant shared: "The chronological presentation of information can make finding the information I am looking for challenging at times. Also, given that the content is only moderated to a certain degree, there are often conflicting opinions presented, which may or may not be helpful."

With respect to unfriendly encounters online, the second overarching theme that emerged, many participants reported that there was a lot of "gatekeeping" on social media platforms, meaning some people refused to share information about specific locations. Participants also often reported the presence of "internet trolls" and "internet bullies" on these outdoor enthusiasts' social media platforms. One participant noted: "Some of the Facebook groups include hostile people who seem to be there for the sake of arguing or being a know-it-all. I tend to be an observer on these sites but have witnessed people asking simple questions only to have their heads ripped off in the comments."

5.8.6 Using social media to learn about outdoor activities in the context of higher education classes

A portion of the survey pertained to the use of social media platforms in the context of higher education classes. A portion of 42.9% of respondents reported being higher education students, and 47% of these respondents reported having taken an outdoor activity class in the context of a higher education class. The two types of classes that participants most reported were: science classes that included a field portion and outdoor activity classes. Only 2.4% of participants reported having used social media to help them with the contents of the class, whereas 99.2% indicated that this viewing of social media content to help them with the course was not suggested by the teacher. Participants were asked to give an example of when they had used social media to help them with the contents of the class, but too few participants responded to this question for us to generate any common themes.

5.9 Discussion

5.6.1 Major findings

In general, participants reported using social media to learn about their outdoor activities. One of the main reasons participants reported using social media to learn about their outdoor activities was to plan and organize their activities. Planning and organizing activities can fit into the categories of "hard-skills" or "soft-skills" found in Priest & Gass's brick wall model of core competencies for effective outdoor leadership (2018). Obviously, planning and organizing fit into the category of "soft-skills." In another way, planning and organizing could also fit into the category of "hard-skills" because planning and organizing can fit into two main categories of hard-skills defined by this model. First, planning and organizing can fit into the hard-skill category of technical skills because they are specific technical skills relating to the activity. For instance, selecting an itinerary is a technical skill that relates to planning and organizing. Second, planning and organizing can fit into the hard-skill category of safety skills because adequate preparation helps mitigate risks and accidents in the outdoor field (Barton, 2007; Thomas, S. & Raymond, 1998). This overlapping of soft and hard skills, raises several questions: do multiple skills used during outdoor activities fit into several categories of this model? Should another model be developed to consider the multi-dimensional facets of skills needed in the outdoor field?

Our findings which demonstrate that outdoor enthusiasts do indeed use social media to learn about their activities coincide with past research that demonstrates that learning on social media is widespread and one of the main reasons that draw people to use these platforms (Kumar & Gruzd, 2019). This study found that outdoor enthusiasts learned about their activities both intentionally and unintentionally (Dron & Anderson, 2014). Intentional learning on social media occurs when a user deliberately looks up information regarding a certain topic (Dron & Anderson, 2014), for instance, looking up a YouTube video to learn about what outdoor gear to bring on a winter camping expedition. Unintentional learning on a social media platform occurs most often when "scrolling" on a social media platform: a user will pick up certain knowledge, for instance, scrolling on Instagram and coming across a post that describes the various phases of hypothermia.

Our study also coincides with past research that demonstrates that technology is increasingly a part of outdoor activities (Arts, 2021; Hills, 2019; Reed et al., 2022; Reed, J. et al., 2024; van Kraalingen, 2021). Furthermore, this study demonstrates that outdoor enthusiasts do indeed form virtual online communities that help them learn and acquire information about their activities. This finding coincides with Boutroy's and Kotut's studies that also found that an internet forum specialized in an outdoor discipline allows users to share skills (Boutroy, 2022; Kotut et al., 2020). This study also coincides with some of the findings of

past research regarding the use of social media to search for information about a specific subject. Social media is not only used to learn about a specific subject, but also to connect with people and to get ideas and inspiration (Chung & Koo, 2015; Hamid et al., 2016; Zhao & Zhang, 2017).

The findings of our study also help support our adaptation of the SOMA model by demonstrating the interactions that take place on social media platforms between the outdoor enthusiast (the subject), the educational social media content on the topic of outdoor activities (object) and the format of the educational content on social media (agent). Our findings showed that outdoor enthusiasts learn from sharing information with each other; however, we found that our adapted SOMA model failed to account for the interactions that took place between outdoor enthusiasts, or between subjects, on social media platforms. It would be of interest for a future adaption of this model to account for "subjects" learning from each other, especially considering that peer to peer learning on social media is widespread and increasing in educational settings (Alkhathlan & Al-Daraiseh, 2017; Casey & Wells, 2015; Rothkrantz, 2015).

As previously highlighted, this study found that in four questions, there were statistically significant differences between individual characteristics and answers to these questions. First, younger respondents answered more "yes" to the question of whether they followed influencers that post content about outdoor activities than older participants. This can perhaps be explained by the fact that younger Canadians use social media more than older Canadians (Schimmele et al., 2021) and the fact that young adults are increasingly spending more time on social media following influencers (Croes & Bartels, 2021). Second, the survey found that Quebec residents had more of a tendency not to use social media to learn or acquire information about their outdoor activities compared to residents of other provinces. No other studies were found that could potentially help support this claim. However, our hypothesis is that perhaps Quebecers use social media less than people from other provinces to learn or acquire information about their outdoor activities because there is less outdoor activity content available in French on social media. It would be of interest for future research to attempt to try to answer the following question: to what extent do anglophone outdoor enthusiasts use social media for learning over those for whom English is not their first language? Third, participants who practiced rock-climbing had more of a tendency to follow influencers that post content about outdoor activities than those who do not practice rock-climbing. This finding can perhaps be explained by the fact that recently rock climbing "has experienced a remarkable increase in popularity and media attention" and that social media helps climbers provide visual proof of their accomplishments (Dumont, 2017). Finally, participants who practiced canoeing had more of a tendency to follow influencers that post content about outdoor activities than those who do not practice canoeing. Although no scientific literature was found regarding the use of social media by canoe enthusiasts, this result can perhaps be

explained by the long history of canoe clubs and associations in Canada (Benidickson, 1982; Raffan & Horwood, 1988). This increase of following of influencers by canoers fits into the concept of *canexus* which was coined to designate canoeing as a way of "linking people to each other, to culture and to the land" (Raffan & Horwood, 1988, p. 1).

The results of this study also fit into this broader context of widespread social media use, notably for educational and informative purposes in Canada. Most Canadians widely use social media. As highlighted in the 2018 Canadian Internet Use Survey, today social media is "prevalent across all age groups, regularly used by about 9 in 10 Canadians aged 15 to 34 […], by about 8 in 10 of those aged 35 to 49 […]6 in 10 of those aged 50 to 64 and about 1 in 3 seniors" (Schimmele et al., 2021). As reported by the Canadian Internet Survey in 2020, more than three-quarters of Canadians used social media to look up information (Statistics Canada, 2020).

Most scientific literature tends to emphasize the negative aspects of the links between technology and the outdoors. In particular, research emphasizes how social media can be a source of distraction in the outdoors (van Kraalingen, 2021) and how sharing images of OA on social media can create an unrealistic vision of OA. As explained by Shultis, "technology both ables and disables wilderness" (2012b). The results of this survey mainly fit into the category of technology "abling" wilderness because this study demonstrates that social media does indeed help outdoor enthusiasts practice their activities.

5.6.2 Limitations

Some limitations of this study need to be pointed out. First, because participants were recruited via social media this increased the likelihood of them using social media to learn about their outdoor activities. Second, participants were only recruited via Facebook. Hence, outdoor enthusiasts who use social media, but do not use Facebook were not questioned. Third, participants were recruited via Facebook groups pertaining to six outdoor disciplines. Hence, outdoor enthusiasts who were members of Facebook groups pertaining to other outdoor disciplines were not solicited. By recruiting participants only through Facebook groups pertaining to six outdoor disciplines, we did not collect certain data that might have influenced this study. For instance, an outdoor enthusiast who practices mountain biking avidly and only uses TikTok as a social media platform could not have been included in this study. Regarding the data analysis, a limitation we encountered with the qualitative data was the use of an anonymous survey, which rendered it unfeasible to reach out to the study participants for additional clarification on their responses. It would be interesting for future research to investigate whether gender influences how outdoor enthusiasts use social media to learn about their activities.

5.6.3 Conclusion

Although the advantages and disadvantages of using social media for learning purposes are still being debated, the prevalence of social media in education and learning is evident. Learning on social media about a wide array of subjects is widespread and here to stay. The findings of this study indicated that Canadian outdoor enthusiasts use social media to learn about a variety of subjects. Some of the main skills that they reported most using social media to learn about are outdoor gear or equipment choices, routes and itineraries, and to help plan their outdoor activities. Many participants reported using social media to not only get ideas and inspiration from other outdoor enthusiasts, but also to connect with other outdoor enthusiasts. This finding coincides with past research that demonstrates how using social media can create online community of practices (Boutroy, 2022; Kotut et al., 2020; Plant, 2004; Venkatesh et al., 2014; Wenger, 2011).

Learning about outdoor activities through social media is a new area of research. This study situates the changing landscape of learning about outdoor activities and outdoor education in a broader context. As explained by Arts (2021) social media actively shapes the interactions between people and nature. As demonstrated by this study, one of the ways that social media shapes these interactions is through educational content. Beyond the initial research topic orientations that should be prioritized listed above, the results of research related to social media and outdoor activities must be shared with outdoor organizations for them to create adequate content that best fits the needs of outdoor enthusiasts. The following practical recommendations based on the survey results and analysis are destined to help these outdoor organisations create content that best fits the needs of outdoor enthusiasts in order to help them practice their activities.

1. Include up to date information (in particular up to date information regarding trail conditions)
2. Include information regarding the gear required to practice the activities
3. Include information that helps outdoor enthusiasts plan their activities
4. Include clear, precise and synthesized information

There is extensive research proving the benefits of practicing outdoor activities. Because social media helps outdoor enthusiasts to practice their activities, it is of much importance to continue conducting research on the educational content found on social media related to outdoor activities. Moreover, because of the inherent risks present in the practice of outdoor activities (Palmer, 2004; Thomas, 2005) and the rise of accidents happening during outdoor activities (Castonguay, 2016; Cockrell & LaFollette, 1985; Priest, 1987; Réseau de plein air Québec, 2023), we suggest that future research also investigate the links between risk management and outdoor activities educational social media content. As shown in this study, social media

and learning about the outdoors in an informal way are intertwined. More research needs to be conducted to better understand how outdoor enthusiasts use social media as a tool for learning about their activities in an informal manner. Some future research questions on this topic are: How does the viewing of content related to outdoor activities influence outdoor enthusiasts risk management practices? How does the viewing of content related to outdoor activities influence the dynamics between clients and guides during outdoor activities? Is there a disparity regarding outdoor activities' information shared on social media by influencers and outdoor organization?

CHAPTER 6
CONCLUSION

Although the advantages and disadvantages of using social media for learning purposes are still being debated, the prevalence of social media in education and learning is evident. Learning on social media about a wide array of subjects is widespread and here to stay. The findings of this study indicated that Canadian outdoor enthusiasts use social media to learn about a variety of subjects. Some of the main skills that they reported most using social media to learn about are outdoor gear or equipment choices, using social media to learn about routes and itineraries, and using social media to help them plan their outdoor activities. Many participants reported using social media to not only get ideas and inspiration from other outdoor enthusiasts, but also to connect with other outdoor enthusiasts. This finding coincides with past research that demonstrates how using social media can create online community of practices (Boutroy, 2022; Kotut et al., 2020; Plant, 2004; Venkatesh et al., 2014; Wenger, 2011).

Despite the limitations of this study pointed out in the article, it provides initial and evidence that Canadian outdoor enthusiasts do indeed use social media to learn about their activities. Furthermore, this research demonstrates how these outdoor enthusiasts use social media to learn about their activities. As shown in this study, social media and learning about the outdoors in an informal way are intertwined. More research needs to be conducted to better understand how outdoor enthusiasts use social media as a tool for learning about their activities in an informal manner. Some future research topic orientations on the subject to prioritize are as follows: an analysis of educational social media content shared by a variety of sources and pertaining to a variety of outdoor disciplines and qualitative interviews with outdoor enthusiasts who use social media to learn about their activities.

Learning about outdoor activities through social media is a new area of research. This study reveals the changing landscape of learning about outdoor activities and outdoor education in a broader context. As explained by Arts (2021) social media actively shapes the interactions between people and nature. As demonstrated by this study, one of the ways that social media shapes these interactions is through educational content related to outdoor activities found on social media. Beyond the initial research topic orientations that should be prioritized that are listed above, the results of research related to social media and outdoor activities must be shared with outdoor organizations for them to create adequate content that best fits the needs of outdoor enthusiasts. There is extensive research proving the benefits of practicing outdoor activities and seeing as social media helps outdoor enthusiasts to practice their activities, it is of much importance to continue conducting research on the educational content found on social media related

to outdoor activities. Moreover, because of the inherent risks present in the practice of outdoor activities (Palmer, 2004; Thomas, 2005) and the rise of accidents happening during outdoor activities (Castonguay, 2016; Cockrell & LaFollette, 1985; Priest, 1987; Réseau de plein air Québec, 2023), we suggest that future research also investigate the links between risk management and outdoor activities educational social media content. Some future research questions on this top are: How does the viewing of content related to outdoor activities influence outdoor enthusiasts risk management practices related to their activities? How does the viewing of content related to outdoor activities influence the dynamics between clients and guides during outdoor activities? Is there a disparity regarding outdoor activities' information shared on social media by influencers and outdoor organizations?

APPENDIX A
FACEBOOK PARTICIPANT RECRUITMENT: ENGLISH

I am currently a master's student at the University of Quebec in Montreal researching how outdoor enthusiasts use social media to learn about their outdoor activities.

If you have the time, I would really appreciate it if you could answer the following survey. By answering you will be eligible to win a 100$ gift card to Mountain Equipment Coop!

- Eligibility: You must use social media, be a Canadian resident, be aged 18 and above and practice at least one outdoor activity.
- Involvement: 20 minutes

APPENDIX B
FACEBOOK PARTICIPANT RECRUITEMENT : FRANÇAIS

Je suis présentement une étudiante à la maîtrise à l'Université du Québec à Montréal (UQAM) et mon projet de mémoire porte sur comment les pratiquants d'activités de plein air utilisent les réseaux sociaux pour apprendre sur leurs activités de plein air.

Si vous avez le temps, j'apprécierais beaucoup votre participation au questionnaire suivant. En répondant vous courrez la chance de gagner une carte cadeaux de 100$ au MEC (Mountain Equipment Coop)!

- Admissibilité : Vous devez utiliser les réseaux sociaux, être un résident canadien, être âgé de 18 ans ou plus et pratiquer au moins une discipline de plein air.
- Temps d'implication requis : 20 minutes

APPENDIX C
QUESTIONNAIRE EXAMPLE

Moll, R., & Nielsen, W. (2017). Development and validation of a social media and science learning survey. *International Journal of Science Education, Part B*, *7*(1), 14-30.

Supplemental File 1

Social Media and Science Learning Survey

The following survey aims to collect data about the ways you have used social media to support your learning in science in your current science subject (EDxx) and in high school. For the purposes of this study social media is defined as **an online software application that allows for connections and contributions from multiple users.**

There are four sections to this survey: A) Demographics: Some information about you, B) Social media practices and science learning in EDxx, C) Social media practices and science learning in high school science classes, and D) Social media practices and science learning in general

Section A) Demographics: Some information about you

This section of the survey is designed to find out what kinds of social media you usually use in your **everyday life.**

A1. How old are you?

A2. What is your gender? ☐ male ☐ female

A3. Which devices do you use to connect to the Internet? Choose all that apply.

☐ Smartphone/mobile phone ☐ Laptop computer ☐ Desk/home computer
☐ iPad/tablet ☐ iPod ☐ Campus computers

A4. For each social media application listed below indicate what kind of user you are **in your everyday life**.

Non-user: Never heard of it or never used it.
Infrequent User: I use it sometimes.
Frequent User: I use it regularly.
Contributor: I frequently use this application to both read content and to contribute content.

Social Media Application	Non-user	Infrequent User	Frequent User	Contributor
Social networking (e.g., Facebook)				
Communication (e.g., MSN chat, email, text messaging)				
Blogs (e.g., Tumblr)				
Microblogging (e.g., Twitter)				
Document managing and editing tools (e.g., Google documents, Dropbox)				
Social bookmarking (e.g., Delicious)				
Social news (e.g., Reddit)				
Wikis (e.g., Wikipedia, Wikispaces)				
Videosharing (e.g., YouTube)				
Livecasting (e.g., Skype)				
Music sharing (e.g., Last.fm)				
Photography sharing (e.g., Flickr)				
Discussion Forums (e.g., Yahoo answers, ask.com)				
Other? Please list:				

Section B) Social media practices and science learning in EDxx

This section of the survey is designed to find out what kinds of social media tools you use to support your science learning in **EDxx**. 'Support your science learning' means that you use these tools to get information or to connect with others to help you complete the expectations for your class (i.e., while doing assignments, studying or working on projects). Please answer the questions in this section while referring to learning in EDxx.

B2. What grade do you expect to get in EDxx? ☐ HD ☐ D ☐ Cr ☐ P ☐ F

B3. How much effort did you apply to your learning in EDxx?

☐ High ☐ Moderate ☐ Low

B4. For each type of social media application listed below indicate what kind of user you are **when you are using the application to support your science learning in EDxx** and how you've used it.

Non-user: Never heard of it or never used it.
Infrequent User: I use it sometimes.
Frequent User: I use it regularly.
Contributor: I frequently use this application to both read content and to contribute content.

Social Media Application	Non-user	Infrequent User	Frequent User	Contributor	Explain how you've used it in EDxx
Social networking (e.g., Facebook)					
Communication (e.g., MSN chat, email, text messaging)					
Blogs (e.g., Tumblr)					
Microblogging (e.g., Twitter)					
Document managing/editing tools (e.g., Google documents, Dropbox)					
Social bookmarking (e.g., Delicious)					
Social news (e.g., Reddit)					
Wikis (e.g., Wikipedia, Wikispaces)					
Videosharing (e.g., YouTube)					
Livecasting (e.g., Skype)					
Music sharing (e.g., Last.fm)					
Photography sharing (e.g., Flickr)					
Discussion Forums (e.g., Yahoo answers, ask.com)					
UoW Learning management system (SMP)					
Other? Please list.					

B5. Please indicate how frequently you use social media to support your science learning in EDxx in the following ways:

	Never	Sometimes	Regularly
Use Facebook chat (or MSN or texting) to contact a friend to get help with a class assignment.			
Use Skype (or some kind of livecasting service) to connect with a friend or a group to work on a class assignment.			

	Never	Sometimes	Regularly
Ask a science question on an online forum such as Ask.com.			
Collaborate with a classmate on an online document using Google docs (or something similar).			
Create or join a Facebook group with classmates to share homework, links, and to discuss class content.			
Search YouTube for a video to learn about a science concept.			
Access Wikipedia to read about a science concept.			
Answer or comment on a science related topic on a forum such as Ask.com			
Read a science related blog or news items.			
Follow scientists or science related feeds on Twitter.			
Save and share science related bookmarks on Delicious (or some other social bookmarking service).			
Post science related content on a blog.			
Store apps on my smartphone that are useful for learning science.			
I share and/or post videos related to my science learning.			

B6. Please indicate how frequently you engage in the following online science learning behaviours while completing assignments for EDxx

	Never	Sometimes	Regularly
When completing EDxx assignments I work in front of my computer so that I can chat online with my friends when I am stuck.			
When completing EDxx assignments I work in front of my computer so that I can search the Internet and/or Google.			
I search the Internet for the answers to particular assignment questions. When I find the answer I stop looking.			
I search the Internet for information that will help me to understand science concepts better.			
I actively search the Internet for resources (links, videos, websites) that will help my science learning.			
When I find a good science online resource I bookmark it or save it somewhere so that I can access it later.			
I use collaborative tools such as Google documents or a wiki to work with my friends on classwork and projects for EDxx.			
I share online resources (links, documents) for learning science with my classmates.			

B7. When you are doing your EDxx tasks and you are stuck which of the following resources do you access? Indicate which resources you access below and indicate which resource you access most frequently.

Resource	Yes I have done this.	Most frequently accessed resource
Look for an example in a text book		
Text a friend		
Chat with a friend online		
Perform a Google search		
Go to a website directly where I think the answer might be		
Read or ask a question on an online forum such as Ask.com		
Look for a video to teach me about the science concept		
Phone a friend		
Email a friend		
Organize a study group		
Ask an instructor		

Section C) Social media practices and science learning in high school

This section of the survey is designed to find out what kinds of social media tools you used to support your science learning while you were taking any **high school science class.** 'Support your science learning' means that you used these tools to get information or to connect with others to help you complete the expectations for your class (i.e., while doing homework or tasks, studying for exams, writing lab reports or working on projects). Please answer the questions in this section while referring to learning in **your high school science classes**.

C1. What high school science classes did you take? Please list:

C2. What average grade did you get in your high school science classes? ☐ HD ☐ D ☐ Cr ☐ P ☐ F

C3. How much effort did you apply to your learning in your high school science classes?

☐ High ☐ Moderate ☐ Low

C4. For each type of social media application listed below indicate what kind of user you were **when you were using the application to support your science learning in high school** and explain how you used it.

Non-user: Never heard of it or never used it.
Infrequent User: I use it sometimes.
Frequent User: I use it regularly.
Contributor: I frequently use this application to both read content and to contribute content.

Social Media Resource	Non-user	Infrequent User	Frequent User	Contributor	Explain how you used it in high school science.
Social networking (e.g., Facebook)					
Communication (e.g., MSN chat, email, text messaging)					
Blogs (e.g., Tumblr)					
Microblogging (e.g., Twitter)					
Document managing/editing tools (e.g., Google documents, Dropbox)					
Social bookmarking (e.g., Delicious)					
Social news (e.g., Reddit)					
Wikis (e.g., Wikipedia, Wikispaces)					
Videosharing (e.g., YouTube)					
Livecasting (e.g., Skype)					
Music sharing (e.g., Last.fm)					
Photography sharing (e.g., Flickr)					
Discussion Forums (e.g., Yahoo answers, ask.com)					
Learning Management System					
Other? Please list:					

C5. Please indicate how frequently you used social media to support your **science learning in high school** in the following ways:

	Never	Sometimes	Regularly
Use Facebook chat (or MSN or texting) to contact a friend to get help with a class assignment.			
Use Skype (or some kind of livecasting service) to connect with a friend or a group to work on a class assignment.			
Ask a science question on an online forum such as Ask.com.			
Collaborate with a classmate on an online document using Google docs (or something similar).			
Create or join a Facebook group with classmates to share homework, links, and to discuss class content.			
Search YouTube for a video to learn about a science concept.			
Access Wikipedia to read about a science concept.			
Answer or comment on a science related topic on a forum such as Ask.com			
Read science related blog or news items.			
Follow scientists or science related feeds on Twitter.			
Save and share science related bookmarks on Delicious (or some other social bookmarking service).			
Post science related content on a blog.			
Store apps on my smartphone that are useful for learning science.			
I share and/or post videos related to my science learning.			

C6. Please indicate how frequently you engaged in the following online science learning behaviours while completing homework and/or assignments for **high school science classes**:

	Never	Sometimes	Regularly
When completing high school science homework I worked in front of my computer so that I could chat online with my friends when I was stuck.			
When completing high school science homework I worked in front of my computer so that I could search the Internet and/or Google.			
I searched the Internet for the answers to particular science assignment questions. When I found the answer I stopped looking.			
I searched the Internet for information that would help me to understand science concepts better.			
I actively searched the Internet for resources (links, videos, websites) that would help my science learning.			
When I found a good science online resource I bookmarked it or saved it somewhere so that I could access it later.			
I used collaborative tools such as Google documents or a wiki to work with my friends on classwork and projects for high school science subjects.			
I shared online resources (links, documents) for learning science with my classmates.			

C7. When you were doing your **high school science homework** and you were stuck which of the following resources did you access? Indicate which resources you accessed below and which resource you accessed the most.

Resource	Yes I did this.	Most frequently accessed resource
Look for an example in the text book		
Text a friend		
Chat with a friend online		
Perform a Google search		
Go to a website directly where I think the answer might be		

Read or post on an online forum such as Ask.com		
Look for a video to teach me about the concept		
Phone a friend		
Email a friend		
Organize a study group		
Ask an instructor		

Section D) Social media practices and science learning in general

D1. What is the biggest benefit to having access to the Internet for learning science?

D2. What is the one online or social media application that you could not live without while studying science?

D3. Has the way you've used social media or online resources to support your science learning changed from the way you used them in high school to the way you use them now? If so, how?

D4. Did any of your high school science teachers or university science classes use any social media applications to deliver content or to interact with students? If so, please describe how the social media applications were used and the ways that you felt it was (or wasn't) beneficial to your learning.

Thanks so much for completing the Social Media and Science Learning Survey! Your participation is greatly appreciated.

APPENDIX D

FACEBOOK GROUPS TARGETED

Province of Facebook Group	Outdoor Discpline	Facebook Group name	Number of members 25/01/23	URL LINK
Alberta	Hiking/Backpacking	Hike Alberta	76.2K	https://www.facebook.com/groups/hikealberta
	Rockclimbing	N/A	N/A	
	Canoeing	N/A	N/A	
	Kayaking	Kayak Alberta & BC	17.2K	https://www.facebook.com/groups/308925592515866
	Backcountry skiing	Revelstoke Ski Tourers	7.9k	https://www.facebook.com/groups/224625797954725
	Cross-country skiing	Cross country Skiing YYC	10k	https://www.facebook.com/groups/562727260820378
British Columbia	Hiking/Backpacking	Hiking British Columbia	123k	https://www.facebook.com/groups/thehikingbc
	Rockclimbing	Squamish Rock Climbing	22k	https://www.facebook.com/groups/squamishrockclimbing
	Canoeing	BC Canoeing	2.6k	https://www.facebook.com/groups/bccanoeing
	Kayaking	Kayak Alberta & BC	17.2K	https://www.facebook.com/groups/308925592515866
	Backcountry skiing	Kootenay Backcountry Touring Group	4.2k	https://www.facebook.com/groups/495688160839544
	Cross-country skiing	N/A		
Manitoba	Hiking/Backpacking	Hiking Manitoba	13k	https://www.facebook.com/groups/810758152436911
	Rockclimbing	N/A		
	Canoeing	Manitoba Canoeists	1.7k	https://www.facebook.com/groups/624291497668262
	Kayaking	Kayak Manitoba	3.6k	https://www.facebook.com/groups/kayakmanitoba
	Backcountry skiing	N/A		
	Cross-country skiing	A Cross Country Ski Club	2.4k	https://www.facebook.com/groups/228566080653918
New Brunswick	Hiking/Backpacking	Hiking NB	15.4k	https://www.facebook.com/groups/406875026542835
	Rockclimbing	New Brunswick Climbing	1.9k	https://www.facebook.com/groups/ascentnb
	Canoeing	We want to go canoeing in New Brunswick	492	https://www.facebook.com/groups/1597009273916330
	Kayaking	Kayaking and Paddle boarding in New Brunswick	127	https://www.facebook.com/groups/1102603600328433
	Backcountry skiing	N/A		
	Cross-country skiing	N/A		
	Other: camping	Camping New Brunswick Canada	19k	https://www.facebook.com/groups/79665103797
Newfoundland and Labrador	Hiking/Backpacking	Hiking in Newfoundland and Labrador (Hike NL)	44.5k	https://www.facebook.com/groups/1525331824356915
	Rockclimbing	Climb Newfoundland	1.4k	https://www.facebook.com/groups/1404950793106795
	Canoeing	Newfoundland Hiking, Canoeing, Backcountry Camping and Bushcraft	2.3k	https://www.facebook.com/groups/3636773275112125
	Kayaking	Kayak Newfoundland and Labrador	2.6k	https://www.facebook.com/groups/7611207418
	Backcountry skiing	N/A		
	Cross-country skiing	Cross-Country Ski NL	281	https://www.facebook.com/groups/411529015927958
Northwest Territoiries	Hiking/Backpacking	N/A		
	Rockclimbing	N/A		
	Canoeing	N/A		
	Kayaking	N/A		
	Backcountry skiing	N/A		
	Cross-country skiing	N/A		
	Other: outdoors general	Northwest Territories Outdoors	510	https://www.facebook.com/groups/1634719370185344
Nova Scotia	Hiking/Backpacking	Hiking Trails of Nova Scotia	7.1k	https://www.facebook.com/HikingTrailsOfNovaScotia
	Rockclimbing	Rock Climbing in Nova Scotia	1.8k	https://www.facebook.com/groups/445133342288506
	Canoeing			
	Kayaking	Kayakers of Nova Scotia	4.2k	https://www.facebook.com/groups/1157795881314286
	Backcountry skiing	N/A		
	Other: camping	Camping in Nova Scotia	28.6k	https://www.facebook.com/groups/422927481250342
Nunavut	Hiking/Backpacking	N/A		
	Rockclimbing	N/A		
	Canoeing	N/A		
	Kayaking	N/A		
	Backcountry skiing	N/A		
	Cross-country skiing	ANIRAJACK Ski and Adventure Club- Iqaluit	863	https://www.facebook.com/groups/aniirajakiqaluit

Province of Facebook Group	Outdoor Discpline	Facebook Group name	Number of members 25/01/23	URL LINK
Ontario	Hiking/Backpacking	Ontario Hiking	96k	https://www.facebook.com/groups/ontariohiking
	Rockclimbing	Ontario Climbing 2023	6.6k	https://www.facebook.com/groups/ontarioclimbing2k
	Canoeing	Kayaking and Canoeing in Ontario	24k	https://www.facebook.com/groups/799160406783507
	Kayaking	Kayaking and Canoeing in Ontario	24k	https://www.facebook.com/groups/799160406783507
	Backcountry skiing	N/A		
	Cross-country skiing	N/A		
Prince Edward Island	Hiking/Backpacking	Hiking PEI	2k	https://www.facebook.com/groups/337769558080091
	Rockclimbing	N/A		
	Canoeing	N/A		
	Kayaking	N/A		
	Backcountry skiing	N/A		
	Cross-country skiing	N/A		
Quebec	Hiking/Backpacking	Passionnés de Rando	100.4k	https://www.facebook.com/groups/2096458447301982
	Canoeing	Canot Quebec	5.7k	https://www.facebook.com/groups/1406203073026949
	Kayaking	Kayak Québec	12k	https://www.facebook.com/groups/202487936438575
	Rockclimbing	Escalade au Québec	7.2k	https://www.facebook.com/groups/114450548632598
	Backcountry skiing	Ski Hors Piste, Ski de Montagne, Québec	8.2k	https://www.facebook.com/groups/371738430507491
	Cross-country skiing	Les Trippeux de Ski de Fond	40k	https://www.facebook.com/groups/lestrippeuxdeskidefond
Saskatchewan	Hiking/Backpacking	Hiking Saskatchewan	19.3k	https://www.facebook.com/groups/189641178116080
	Canoeing	Saskatchewan Canoe & Kayak Trips	8.3k	https://www.facebook.com/groups/1989570851294879
	Kayaking	Saskatchewan Canoe & Kayak Trips	8.3k	https://www.facebook.com/groups/1989570851294879
	Rockclimbing	N/A		
	Backcountry skiing	N/A		
	Cross-country skiing	N/A		
	Other: outdoor enthusiasts	Saskatchewan Outdoor Enthusiasts	3.9k	https://www.facebook.com/groups/1561927630706640
Yukon	Hiking/Backpacking	Happy Hikers Yukon	5.5k	https://www.facebook.com/groups/happyhikersyukon
	Canoeing	Paddling Yukon	4.5k	https://www.facebook.com/groups/yukonpaddlers
	Kayaking	Paddling Yukon	4.5k	https://www.facebook.com/groups/yukonpaddlers
	Rockclimbing	N/A		
	Backcountry skiing	Yukon Backcountry Snow Sharing Network	2.1k	https://www.facebook.com/groups/1517259278604398
	Cross-country skiing	Yukon Cross Country Skiing Conections	561	https://www.facebook.com/groups/4650264708353655

APPENDIX E

SURVEY

Section A: General research information and consent form

Research project title Social media as a learning strategy for the development of hard skills for outdoor enthusiasts: a Canadian perspective

Student-researcher Charlotte Huebner, Masters in physical activity sciences 514-816-9822
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Research supervisor Tegwen Gadais, Université du Québec à Montréal, Département des sciences de l'activité physique, gadais.tegwen@uqam.ca

Research co-supervisor Christian Mercure, Université du Québec à Chicoutimi, Département des sciences humaines, christian_mercure@uqac.ca

Preamble You are invited to participate in a research project that involves filling out the following survey. Before accepting to participate in this project, please take the time to understand and carefully consider the information that follows. This consent form explains the purpose of the study, the procedures, the benefits, the risks and disadvantages as well as the people to contact if necessary. The present form might include words that you may not understand. Please do not hesitate to ask the researcher any questions you may have.

Decription of project and its objectives

The present research project aims to study how Canadian outdoor enthusiasts use social media to learn about their activities. This research aims to clarify what type of content outdoor enthusiasts consult and in which contexts. Your participation in this study involves filling out the following survey. We hope to have around 200 participants in this study. This study aims to uncover how outdoor enthusiasts use social media to learn about their activities.

Nature and duration of your participation The present survey is an online survey that should take around 30 minutes to fill out.

Benefits associated with participating in the present study By participating in this study, you are eligible to win a 100$ gift card to Mountain Equipment Coop (MEC). At the end of the survey, you will have the option to indicate your email address in order to be eligible for the draw of this gift card. The divulgation of your email address and participation in this draw is optional.

Risks associated with participating in the present study There are no risks involved in the participation in this study.

Confidentiality

All information recorded is anonymous. At the end of the survey, you will be asked if you wish to share your email address in order to be eligible for the draw of the 100$ Mountain Equipment Coop (MEC) gift card. However, this email address will not be associated to the answers in the survey, and this email aaddress will not be used for research purposes.

Only the main researcher and her supervisors will have access to your anonymous answers. Your answers to the questionnaire will then be exported into Excel and Limesurey. The email addresses will be destroyed following the draw that will take place directly after the survey is closed.

All documents will be destroyed one year after the last scientific communication.

Voluntary participation and right to withdraw Your participation in this project is entirely voluntary. You may refuse to participate or you may withdraw from the study at any time without the need to justify your decision. If you decide to withdraw from the study, you only need to verbally inform the researcher; in this case, all data concerning you will be destroyed.

Compensation No compensatory allowance is provided besides the participation in the draw.

Questions concerning the research project? If you have any further questions concerning your participation or the study itself, you may contact the people responsible for the project: Charlotte Huebner, Maîtrise en sciences de l'activité physique 514-816-9822 Huebner.charlotte@courrier.uqam.ca Tegwen Gadais, Université du Québec à Montréal, Département des sciences de l'activité physique, gadais.tegwen@uqam.ca Christian Mercure, Université du Québec à Chicoutimi, Département des sciences humaines, christian_mercure@uqac.ca

Any questions concerning your rights? The research ethics review committee involving human subjects (CERPE) has approved this research project in which you are involved. If you have any ethical concerns or complaints about your participation in this study, and want to speak to someone who is not on the research team, please contact the coordinator of CERPE: CERPÉ de la

A2. **Secondary use of data**
Do you accept that research data be used to carry out other research projects in the same area of study?
These research projects will be evaluated and approved by a Research Ethics Board at UQAM before they are completed. Research data will be stored in a secure place. In order to preserve your identity and the confidentiality of the research data, you will be identified by a code number; Do you accept that research data will be used in the future by other researchers under these conditions?

Yes ☐

Section B: Inclusion criteria

B1. **Do you use social media?**

Yes ☐
No ☐

B2. **Are you 18 years old or older?**

Yes ☐
No ☐

B3. **Do you practice an outdoor activity at least once a year?**

Yes ☐
No ☐

B4. **Are you a Canadian resident or citizen?**

Yes ☐
No ☐

Section C: General questions

For the purpose of this survey:

Social media is considered as an umbrella term that describes a variety of online platforms. There are numerous categories of social media. For the purpose of this study the following social media categories will be considered:

- Social networking sites: ex. Facebook

- Social media sharing websites: ex. Facebook, instagram, TikTok, Youtube, Snapchat

- Microblogging: ex. Reddit

- Social news: ex. Facebook, Youtube

Outdoor activities are considered as human-powered activities that take place in a natural outdoor setting: ex. hiking, rock climbing, skiing, snowshoeing, biking, canoeing and kayaking.

C1. What is your current province or territory of residence?

- ☐ Alberta
- ☐ British Columbia
- ☐ Manitoba
- ☐ New Brunswick
- ☐ Newfoundland and Labrador
- ☐ Northwest Territories
- ☐ Nova Scotia
- ☐ Nunavut
- ☐ Ontario
- ☐ Prince Edward Island
- ☐ Quebec
- ☐ Saskatchewan
- ☐ Yukon

C2. How old are you?

C3. **Are you a higher education student (ex. University or Cégep student)?**

Yes ☐

No ☐

C4. **Have you taken an outdoor activity class in the context of a higher education class (education or science class that included and outdoor activity)?**

Yes ☐

No ☐

C5. **If yes, please name the class or the classes taken**

C6. **Did you use social media to help you with the contents of the class?**

Yes ☐

No ☐

C7. **If yes, please explain further or give an example**

C8. **Was this viewing of social media content suggested by the teacher of this/these course?**

Yes ☐

No ☐

C9. **If yes, please elaborate or give an example**

C10. What is your level of expertise in the following disciplines?

	I do not practice this activity	Beginner	Intermediate	Advanced	Expert
Hiking/Backpacking	☐	☐	☐	☐	☐
Rockclimbing	☐	☐	☐	☐	☐
Canoeing	☐	☐	☐	☐	☐
Kayaking	☐	☐	☐	☐	☐
Backcountry skiing	☐	☐	☐	☐	☐
Cross-country skiing	☐	☐	☐	☐	☐

C11. Do you practice any other outdoor activities then those listed above?

Yes ☐

No ☐

C12. If you answered yes on the previous question, please specify the activity or activities in question and specify what is your level of expertise in the practice of this activity (ex. beginner, intermediate, advanced, expert)

C13. Please select up to three ressources that you most use when you are trying to search for a specific information about an outdoor activity and then rank these ressources that you use (bottom ressource being the ressource you least use and the ressource on top being the ressource you most use)

Look up the information on the internet (ex. perform a Google search) ☐

Look up the information on an AI platform (ex. Chat GPT) ☐

Look up the information on a social media platform (ex. youtube, an instagram post) ☐

Go to a website directly where you think the answer is ☐

Ask a friend or family member ☐

Ask an outdoor professional (ex. guide) or teacher ☐

C14. **Please select up to three actions that you most perform on social media platforms and then rank those actions (the bottom action being the action you least do, and the top action being the action you most often do)**

- Watch videos ☐
- Look at pictures ☐
- Scroll on feed ☐
- Ask questions on forums and/or social media groups ☐
- Post content (ex. pictures, videos, stories, reels, etc..) ☐

Section D: Using social media to learn about outdoor activities- General questions

D1. **Do you use social media platforms to learn or acquire information about your outdoor activities (ex. Youtube, Instagram, Facebook, Reddit, TikTok)?**

- Yes ☐
- No ☐

D2. **Please give an example of when you have used social media to learn about your outdoor activities**

D3. **Please select up to three actions that most help you learn or acquire information about outdoor activities and then rank these actions (bottom being the action that least helps you and the top being the action that most helps you)**

- Watching videos ☐
- Looking at pictures ☐
- Consulting forums ☐
- Asking questions on social media groups ☐
- Reading posts ☐

D4. **Is there any other action or type of content on social media that helps you learn or acquire information about outdoor activities?**

Yes ☐

No ☐

D5. **If yes, please explain further**

D6. **Do you follow influencers that post content about outdoor activities on social media?**

Yes ☐

No ☐

D7. **Does the content posted by these influencers help you learn or acquire information about your outdoor activities?**

Yes ☐

No ☐

D8. **If yes, please explain or give an example**

D9. **Do you follow outdoor organisations on social media (ex. Parcs Canada, Leave No Trace, Paddle Canada)?**

Yes ☐

No ☐

D10. **Does the content posted by these outdoor organizations help you learn or acquire information about your outdoor activities?**

Yes ☐

No ☐

D11. If yes, please explain and/or give an example

D12. Do you ever face challenges associated with searching for information or learning about outdoor activities on social media platforms?

Yes ☐

No ☐

D13. Please explain or give an example

D14. For the following each question please select one answer from the following scale ranging from 1-strongly disagree to 5-strongly agree

	1. Strongly disagree	2. Disagree	3. Neither (neutral)	4. Agree	5. Strongly agree
I use social media to learn about the outdoor activities that I practice	☐	☐	☐	☐	☐
I use social media look up videos about the outdoor activities that I practice	☐	☐	☐	☐	☐
I use social media to ask questions about the outdoor activities that I practice	☐	☐	☐	☐	☐
My social media feed shows me educational content related to outdoor activities	☐	☐	☐	☐	☐
Please select "3. Neither (neutral)" on this line	☐	☐	☐	☐	☐
I double check that the information that I'm consulting on social media about outdoor activities is accurate before using it	☐	☐	☐	☐	☐
I am more likely to trust information that is shared by outdoor organizations over information shared by influencers	☐	☐	☐	☐	☐
The information I find on social media helps me to practice my outdoor activities	☐	☐	☐	☐	☐

Section E: Types of content viewed on social media relating to outdoor activities

E1. For the following each question please select one answer from the following scale ranging from 1-strongly disagree to 5-strongly agree

	1. Strongly disagree	2. Disagree	3. Neither (neutral)	4. Agree	5. Strongly agree
I use social media to help me plan my outdoor activities	☐	☐	☐	☐	☐
I use social media to learn route/itinerary choices	☐	☐	☐	☐	☐
I use social media to learn about outdoor survival skills	☐	☐	☐	☐	☐
I use social media to learn about outdoor gear or equipment choices	☐	☐	☐	☐	☐
I use social media to learn about risk management aspects regarding the outdoor activities (ex. Knowing how to contact rescue services if an accident or problem should occur)	☐	☐	☐	☐	☐
Please select "2. Disagree" on this line	☐	☐	☐	☐	☐
I use social media to learn about specific technical skills relating to the outdoor activities that I practice (ex. paddle strokes, knowing how to tie certain knots, knowing how to properly pack a backpack)	☐	☐	☐	☐	☐
I use social media to learn about Leave No Trace principles and how to minimize my impact on the environment when practicing an outdoor activity	☐	☐	☐	☐	☐
I use social media to learn about environmentally sustainable actions relating to the outdoor activities that I practice	☐	☐	☐	☐	☐

Section F: MEC Giftcard Draw

F1. Please enter your email address to be eligible to win a 100$ Mountain Equipment Coop (MEC) giftcard

APPENDIX F
ETHICS CERTIFICATE

UQÀM | Comités d'éthique de la recherche avec des êtres humains

No. de certificat : 2024-5685
Date : 2023-09-18

CERTIFICAT D'APPROBATION ÉTHIQUE

Le Comité d'éthique de la recherche pour les projets étudiants impliquant des êtres humains (CERPE plurifacultaire) a examiné le projet de recherche suivant et le juge conforme aux pratiques habituelles ainsi qu'aux normes établies par la *Politique No 54 sur l'éthique de la recherche avec des êtres humains* (2020) de l'UQAM.

- Titre du projet : LES MÉDIAS SOCIAUX EN TANT QUE STRATÉGIE D'APPRENTISSAGE POUR LE DÉVELOPPEMENT D'HABILETÉS TECHNIQUES POUR LES PRATIQUANTS D'ACTIVITÉS DE PLEIN AIR : UNE PERSPECTIVE CANADIENNE
- Nom de l'étudiant : Charlotte Huebner
- Programme d'études : **Maîtrise en sciences de l'activité physique**
- Direction(s) de recherche : Christian Mercure; Tegwen Gadais

Modalités d'application

Toute modification au protocole de recherche en cours de même que tout événement ou renseignement pouvant affecter l'intégrité de la recherche doivent être communiqués rapidement au comité.

La suspension ou la cessation du protocole, temporaire ou définitive, doit être communiquée au comité dans les meilleurs délais.

Le présent certificat est valide pour une durée d'un an à partir de la date d'émission. Au terme de ce délai, un rapport d'avancement de projet doit être soumis au comité, en guise de rapport final si le projet est réalisé en moins d'un an, et en guise de rapport annuel pour le projet se poursuivant sur plus d'une année au plus tard un mois avant la date d'échéance (**2024-09-18**) de votre certificat. Dans ce dernier cas, le rapport annuel permettra au comité de se prononcer sur le renouvellement du certificat d'approbation éthique.

Raoul Graf, Ph.D.
Professeur titulaire, Département de marketing
Président du CERPÉ plurifacultaire

APPENDIX G
SOCIAL MEDIA GLOSSARY

Term	Definition
Application (App)	An application, also referred to as an app or a mobile app, is a software that is designed to be downloaded onto a smartphone, tablet, or other another mobile device. An app works similarly to a computer program and can have numerous and various functions such as user interaction, content sharing and productivity aid. Apps can be downloaded on "app stores" or various other distribution platforms. Inukollu, Keshamoni and Kang identify various categories of mobile apps: mobile games, GPS apps, baking apps, ticket purchasing apps, social media apps, fitness apps and location based services (Inukollu et al., 2014).
Algorithm	"In the context of social media, an algorithm is how a social platform determines which content to display at any given time to a particular user. Social networks are notoriously secretive about how their algorithms work, but in general, they use clues based on a user's social relationships and interactions to determine which content that user will find most appealing." (Hootsuite, 2023)
Caption	"A caption is a description that accompanies a photo on social media. Captions can include text, hashtags, @mentions, and emojis" (Hootsuite, 2023).
Clickbait	Clickbait refers to short messages that lure readers to click a link whether or not this message truly is relevant to the content of the video (Potthast et al., 2016). Clickbait has been associated with the rapid spread of rumor and misinformation online (Chen et al., 2015).
Comment	"A comment is a form of engagement in which a user replies to your social media post. Comments can offer praise, ask a question, express disagreement, and otherwise contribute to the online conversation about your social content" (Hootsuite, 2023).

Content creator	Someone who produces content for a social media account. The term content creator is often used to refer to influencers who make money from creating social media content (Goanta & de Gregorio).
Direct message (DM)	"A direct message (DM) is a private message sent through a social platform" (Hootsuite, 2023).
Emoji	"Emojis are a set of tiny graphics used in digital channels from text messages to social media" (Hootsuite, 2023).
Facebook	Facebook is a social media platform that enables users to share content such as links, photos and personal opinions and anecdotes. This shared contact can then be shared with "friends", specific Facebook groups or publicly available to everyone (Rowell, 2019).
Feed	"A feed is an updated list of all the new content posted by the accounts a user follows on social media. Rather than being purely chronological, most social media feeds are controlled by an algorithm" (Hootsuite, 2023).
Forum	An online platform that connect people interested in a similar topic and allows users to post content and receive feedback from other users (Burgess et al., 2017).
Followers	"Followers are people who have liked (or "followed") your accounts on social media" (Hootsuite, 2023).
Friend	The concept of a friend on social media is most often used to refer to "a user of the social media network Facebook who has connected to another user's profile, usually by invitation" (Kilyeni, 2015, p. 434).
FYP (for you page)	"FYP is an acronym that means "For You Page", and refers to the page on TikTok that is filled with recommended content and videos the app thinks you'll enjoy the most" (Hootsuite, 2023).

Hashtag	A hashtag is a word or a group of words used to identify messages, posts or pictures relating to a specific topic or subject (Rowell, 2019).
Influencer	"An influencer is a social media user with a significant audience who can drive awareness about a trend, topic, company, or product" (Hootsuite, 2023).
Instagram	This platforms allows users to share pictures, stories and apply digital filters to these posts (Van Looy, 2016).
Like	In the context of social media, the action of liking allows "users to give positive feedback on social media content without posting a comment" (Kilyeni, 2015, p. 434).
Platform	A platform, defined in the context of social media, is a "software application that supports other software or activities." For instance, a platform can support both social interactions and other softwares within itself, for example Facebook offers games on its platform (Hinton & Hjorth, 2019).
Post	"A post refers to any social media status update, photo, or video, or an item shared on a blog or forum" (Hootsuite, 2023).
Profile	"A profile is an individual users' page that contains all the information they are willing to share about themselves as well as their posts" (Huebner, Emma 2022).
Share	Sharing is an action that allows "users to distribute content from other network users or from Internet sources" (Kilyeni, 2015, p. 434).
Tag	An action that allows users to create a link to the profile of another social media user (Kilyeni, 2015).
Tweet	The action of "tweeting" allows "Twitter users to post up to 140 characters of text, photos, videos or links."(Kilyeni, 2015, p. 435).

Reddit	"Reddit is a social news and bookmarking site that allows users to submit links to stories, pictures, videos, or any other Web content, and have other users either vote them up or down" (Harvey, 2013).
Reel	"Reels is an Instagram feature that allows users to create short-form video content and share them on their Reels, Stories, or Feed"(Hootsuite, 2023)/
Selfie	"Selfies refer to self-portraits taken by oneself using a digital camera or a smartphone" (Qiu et al., 2015, p. 443).
Subscribers	"Subscribers are people who've opted-in to receive communications from a business"(Hootsuite, 2023)
Story	"Instagram stories allow users to capture and post related images and videos in a slideshow format that disappears after 24-hours" (Towner & Muñoz, 2022, p. 221).
Tag	"A tag is a keyword added to a social media post to categorize content. You can also tag someone in a post or photo, which creates a link to their social media profile and associates them with the content. Users have the option to remove unwanted tags from their profile."(Hootsuite, 2023)
TikTok	As defined by Stahl, "TikTok is a popular is a popular social media app that revolves around the creation and sharing of short looping videos. Videos can be soundtracked with a vast selection of music and recorded sounds, and span a wide spectrum in terms of genre, with comedy, music/dance, and lifestyle videos being particularly popular on the platform" (Stahl & Literat, 2022, p. 5).
Twitter	"Twitter is a Web application for microblogging, or publishing miniposts called "tweets," that are limited to 140-character messages (Harvey, 2013).
User-generated content	User-generated content "comes from regular people who voluntarily contribute data, information or media that then appears before others in a useful or entertaining way" (Krumm et al., 2008, p. 10). On social media everyone has the

	ability to created content and make it publicly available (Wyrwoll & Wyrwoll, 2014).
Viral	Viral is a term that refers to a social media post that gets an unusually large number of engagements for example an "exceptional number of shares" (Hootsuite, 2023).
Vlog	Vlogging is the action of recording oneself with a video production tool oneself and then posting this video on a social media site. There exists a wide array of types of vlogs for example "personal diaries [and] commentaries on everyday life or world events" (Aran et al., 2013, p. 201).
Youtube	YouTube is a "website that enables users to upload, view, and share user-generated video content. It provides a forum for people to inform and inspire others and serves as a distribution platform for original content creators and advertisers" (Van Looy, 2016).

BIBLIOGRAPHY

Adventure Travel Trade Association. (2022). *Aventure Travel Industry Snapshot May 2022*. https://learn.adventuretravel.biz/research/2022-adventure-travel-industry-snapshot

Ahmed, Y. A., Ahmad, M. N., Ahmad, N., & Zakaria, N. H. (2019). Social media for knowledge-sharing: A systematic literature review. *Telematics and Informatics*, *37*, 72-112.

Aichner, T., Grünfelder, M., Maurer, O., & Jegeni, D. (2021). Twenty-five years of social media: a review of social media applications and definitions from 1994 to 2019. *Cyberpsychology, behavior, and social networking*, *24*(4), 215-222.

Akcil, U., & Bastas, M. (2020). Examination of university students' attitudes towards e-learning during the covid-19 pandemic process and the relationship of digital citizenship. *Contemporary Educational Technology*, *13*(1), ep291.

Alkhathlan, A. A., & Al-Daraiseh, A. A. (2017). An analytical study of the use of social networks for collaborative learning in higher education. *International Journal of Modern Education and Computer Science*, *9*(2), 1.

Allard, M., & Boucher, S. (1998). *Éduquer au musée: un modèle théorique de pédagogie muséale*. Hurtubise HMH.

Aran, O., Biel, J.-I., & Gatica-Perez, D. (2013). Broadcasting oneself: Visual discovery of vlogging styles. *IEEE Transactions on multimedia*, *16*(1), 201-215.

Ardoin, N. M., DiGiano, M., Bundy, J., Chang, S., Holthuis, N., & O'Connor, K. (2014). Using digital photography and journaling in evaluation of field-based environmental education programs. *Studies in Educational Evaluation*, *41*, 68-76.

Arthur, M. M. L., Clark, R., & Open Textbook, L. (2021). *Social Data Analysis*. Rhode Island College Digital Publishing. https://open.umn.edu/opentextbooks/textbooks/1457

Arts, I., Fisher, A., Duckett, D., Van der Wal, R. (2021). The Instagrammable outdoors – Investigating the sharing of nature experiences through visual social media. *People and Nature*(3), 1244-1256. https://doi.org/DOI: 10.1002/pan3.10239

Asfeldt, M., Purc-Stephenson, R., Rawleigh, M., & Thackeray, S. (2021). Outdoor education in Canada: A qualitative investigation. *Journal of Adventure Education and Outdoor Learning*, *21*(4), 297-310.

Attarian, A., Wagstaff, M., Attarian, A., & Wagstaff, M. (2009). *Technical skills for adventure programming : a curriculum guide*. Human Kinetics.

Ayu, M. (2020). Online learning: Leading e-learning at higher education. *The Journal of English Literacy Education: The Teaching and Learning of English as a Foreign Language*, *7*(1), 47-54.

Barton, B. (2007). *Safety, risk and adventure in outdoor activities*. Paul Chapman.

Beames, S. (2017). Innovation and outdoor education. *Journal of Outdoor and Environmental Education*, *20*(1), 2-6.

Beames, S., & Pike, E. C. (2013). *Outdoor adventure and social theory*. Routledge.

Beauchamp, A.-A., Lacoste, Y., Kingsbury, C., & Gadais, T. (2022). When are you taking us outside? An exploratory study of the integration of the outdoors in preschool and primary education in Quebec. *Front Psychol*, *13*. https://doi.org/10.3389/fpsyg.2022.955549

Becker, C., Lauterbach, G., Spengler, S., Dettweiler, U., & Mess, F. (2017). Effects of regular classes in outdoor education settings: A systematic review on students' learning, social and health dimensions. *International journal of environmental research and public health*, *14*(5), 485.

Beedie, P., & Hudson, S. (2003). Emergence of mountain-based adventure tourism. *Annals of tourism research*, *30*(3), 625-643.

Bekerman, Z., Burbules, N. C., & Silberman-Keller, D. (2006). *Learning in places: The informal education reader* (vol. 249). Peter Lang.

Benidickson, J. (1982). Paddling for pleasure: Recreational canoeing as a Canadian way of life. In M. J and W. G (Eds.) *The Evolution of Recreational Land Use in Canada*. Carleton University Press. https://doi.org/http://dx.doi.org/10.2139/ssrn.2272704.

Bentsen, P., & Jensen, F. S. (2012). The Nature of "Udeskole": Outdoor Learning Theory and Practice in Danish Schools. *Journal of Adventure Education and Outdoor Learning*, *12*(3), 199-219.
Bergeron, N., Mercure, C., Tanguay, C., Morin, P., & Bissonnette, F. (2022). *Étude préliminaire: Vers un programme national pour l'encadrement des activités de plein air*. Réseau de plein air Québec.
Berry, M., & Hodgson, C. (2011). *Adventure education : an introduction* (1). Routledge. http://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=684105
Bialeschki, M. D. (2015). The camp experience: Learning through the outdoors. In S. M. Fine and T. Bennett (Eds.) *Routledge international handbook of outdoor studies* (p. 227-235). Routledge.
Blatt, E., & Patrick, P. (2014). An Exploration of Pre-Service Teachers' Experiences in Outdoor 'Places' and Intentions for Teaching in the Outdoors. *International Journal of Science Education*, *36*(13), 2243-2264. https://doi.org/10.1080/09500693.2014.918294
Bolliger, D. U., McCoy, D., Kilty, T., & Sheperd, C. E. (2021). Smartphone use in outdoor education: a question of activity progression and place. *Journal of Adventure Education and Outdoor Learning*, *21*(1), 53-56. https://doi.org/https://doi.org/10.1080/14729679.2020.1730204
Bourg, D., & Papaux, A. (2015). *Dictionnaire de la pensée écologique*. Presses universitaires de France.
Boutroy, E. (2022). "A Wikipedia of lightweight backpacking": Open-access know-how in an online community of practice. *Ethnologie francaise*, *52*(1), 91-106.
Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of computer-mediated Communication*, *13*(1), 210-230.
Boyraz, S., & Ocak, G. (2021). Connectivism: a literature review for the new pathway of pandemic driven education. *International Journal of Innovative Science and Research Technology*, *6*(3), 1122-1129.
Brandtzæg, P. B., & Heim, J. (2009). Why people use social networking sites. (p. 143-152). Online Communities and Social Computing: Third International Conference, OCSC 2009, Held as Part of HCI International 2009, San Diego, CA, USA, July 19-24, 2009. Proceedings 3, Springer.
Breitenstein, D., & Ewert, A. (1990). Health benefits of outdoor recreation: Implications for health education. *Health Education*, *21*(1), 16-21.
Buckley, R. (2006a). *Adventure tourism*. Cabi.
Buckley, R. (2006b). Adventure tourism research: A guide to the literature. *Tourism Recreation Research*, *31*(2), 75-83.
Burgess, J., Poell, T., & Marwick, A. E. (2017). The SAGE handbook of social media. *The SAGE Handbook of Social Media*, 1-662.
Burton, L. M. (1981). *A critical analysis and review of the research on Outward Bound and related programs*. Rutgers The State University of New Jersey, Graduate School of Applied and ….
Büscher, B. (2016). Nature 2.0: Exploring and theorizing the links between new media and nature conservation. *New Media & Society*, *18*(5), 726-743.
Büscher, B., & Igoe, J. (2013). 'Prosuming'conservation? Web 2.0, nature and the intensification of value-producing labour in late capitalism. *Journal of Consumer Culture*, *13*(3), 283-305.
Callanan, M., Cervantes, C., & Loomis, M. (2011). Informal learning. *Wiley Interdisciplinary Reviews: Cognitive Science*, *2*(6), 646-655.
Canadian Avalanche Association. (2023). *Training Flowchart*. https://www.avalancheassociation.ca/page/Training_Flowchart
Canadian Institute for Health Information. (2021). https://www.cihi.ca/en/search?query=Injury+and+Trauma+Emergency+Department+and+Hospitalization+Statistics%2C+2020%E2%80%932021+
Casey, G., & Wells, M. (2015). Remixing to design learning: Social media and peer-to-peer interaction. *Journal of Learning Design*, *8*(1), 38-54.
Castilho, G. (2019). Rethinking outdoor, experiential and informal education: beyond the confines. *Journal of Adventure Education & Outdoor Learning*, *19*(4), 371-373. https://doi.org/10.1080/14729679.2019.1579103
Castonguay, S. (2016). *Traumatismes et décès en escalade au Québec* [Thesis, Université de Sherbrooke].

Cater, C., & Cloke, P. (2007). Bodies in action: The performativity of adventure tourism. *Anthropology today*, *23*(6), 13-16.
Chen, Y., Conroy, N. J., & Rubin, V. L. (2015). Misleading online content: recognizing clickbait as" false news". (p. 15-19). Proceedings of the 2015 ACM on workshop on multimodal deception detection,
Cheston, C. C., Flickinger, T. E., & Chisolm, M. S. (2013). Social media use in medical education: a systematic review. *Academic Medicine*, *88*(6), 893-901.
Chugh, R., & Joshi, M. (2020). Challenges of knowledge management amidst rapidly evolving tools of social media. In D. Mehdi Khosrow-Pour (Ed.), *Information diffusion management and knowledge sharing: Breakthroughs in Research and practice* (p. 745-760). IGI Global.
Chugh, R., & Ruhi, U. (2018). Social media in higher education: A literature review of Facebook. *Education and information technologies*, *23*, 605-616.
Chung, N., & Koo, C. (2015). The use of social media in travel information search. *Telematics and Informatics*, *32*(2), 215-229.
Cockrell, D., & LaFollette, J. (1985). A National Standard for Outdoor Leadership Certification. *Parks and Recreation*, *20*(6), 40-43.
Corbett, F., & Spinello, E. (2020). Connectivism and leadership: harnessing a learning theory for the digital age to redefine leadership in the twenty-first century. *Heliyon*, *6*(1), e03250.
Coventry, P. A., Brown, J. E., Pervin, J., Brabyn, S., Pateman, R., Breedvelt, J., Gilbody, S., Stancliffe, R., McEachan, R., & White, P. L. (2021). Nature-based outdoor activities for mental and physical health: Systematic review and meta-analysis. *SSM-population health*, *16*, 100934.
Croes, E., & Bartels, J. (2021). Young adults' motivations for following social influencers and their relationship to identification and buying behavior. *Computers in Human Behavior*, *124*, 106910.
Crosslin, M. (2016). From instructivism to connectivism: theoretical underpinnings of MOOCs. *Current Issues in Emerging eLearning*, *3*(1), 6.
Cuthbertson, B., Socha, T. L., & Potter, T. G. (2004). The double-edged sword: Critical reflections on traditional and modern technology in outdoor education. *Journal of Adventure Education & Outdoor Learning*, *4*(2), 133-144.
Darby, P. A. (2020). Escalation of Commitment and Heuristics in Outdoor Leadership: How Poor Education Can Impact Outdoor Leaders' Decisions.
Dennen, V. P., Choi, H., & Word, K. (2020). Social media, teenagers, and the school context: A scoping review of research in education and related fields. *Educational Technology Research and Development*, *68*, 1635-1658.
Destination BC. (2014). *"Tourism Sector Profile: Outdoor Adventure."*. https://www.destinationbc.ca/getattachment/Research/Research-by-%20Activity/Land-based/Tourism-Sector-%20Profile_OutdoorAdventure_May2014.pdf.aspx
Donaldson, G. W., & Donaldson, L. E. (1958). Outdoor education a definition. *Journal of Health, Physical Education, Recreation*, *29*(5), 17-63.
Dron, J., & Anderson, T. (2014). *Teaching crowds: Learning and social media*. Athabasca University Press.
Dumont, G. (2017). The beautiful and the damned: The work of new media production in professional rock climbing. *Journal of Sport and Social Issues*, *41*(2), 99-117.
Ewert, A., & Boone, T. (1987). Risk management: Defusing the dragon. *Journal of Experiential Education*, *10*(3), 28-35.
Ewert, A., & Sibthorp, J. (2014). *Outdoor adventure education: Foundations, theory, and research*. Human Kinetics.
Ewert., & Sibthorp. (2014). *Outdoor adventure education: Foundations, theory, and research*. Human Kinetics.
Fang, B.-B., Lu, F. J., Gill, D. L., Liu, S. H., Chyi, T., & Chen, B. (2021). A systematic review and meta-analysis of the effects of outdoor education programs on adolescents' self-efficacy. *Perceptual and motor skills*, *128*(5), 1932-1958.

Federal and Provincial Territorial Governments of Canada. (2014). *2012 Canadian Nature Survey: Awareness, participation, and expenditures in nature-based recreation, conservation, and subsistence activities*. Environment Canada.
Frauenberger, C. (2019). Entanglement HCI the next wave? *ACM Transactions on Computer-Human Interaction (TOCHI)*, *27*(1), 1-27.
Gadais, T., Daigle, P., Lacoste, Y., Beaumont, J., Laforest, E., & Sauriol, C. (2018). Enseigner des activités DE, EN, PAR et POUR le plein air en EPS. *Propulsion*, *31*(2), 30-35.
Gadais, T., Lacoste, Y., & Daigle, P. (2019). Didactiser ses activités de plein air en éducation physique et à la santé: La notion de gradient de plein air. *Propulsion*, *32*(2), 35-39.
Gartner, W. C., & Lime, D. W. (2000). *Trends in outdoor recreation, leisure, and tourism*. Cabi.
George, D. R., Rovniak, L. S., & Kraschnewski, J. L. (2013). Dangers and opportunities for social media in medicine. *Clinical obstetrics and gynecology*, *56*(3).
Germain, C. (1989). Un cadre conceptuel pour la didactique des langues. *Études de linguistique appliquée*, *75*, 61.
Gilbertson, K., Ewert, A., Siklander, P., & Bates, T. (2022). *Outdoor education: Methods and strategies*. Human Kinetics.
Global, I. G. I., & Information Resources Management, A. (2018). *Social media in education : breakthroughs in research and practice*. IGI Global. https://doi.org/10.4018/978-1-5225-5652-7
Goanta, C., & de Gregorio, G.). 12 Content Creator/Influencer. *PLATFORM*, 69.
Goldie, J. G. S. (2016). Connectivism: A knowledge learning theory for the digital age? *Medical teacher*, *38*(10), 1064-1069.
Gómez-Ortiz, M.-J., Domínguez Romero, E., & Bobkina, J. (2023). Instagram as a learning tool to improve technical vocabulary for sports science students. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *32*. https://doi.org/10.1016/j.jhlste.2022.100416
Gouvernement du Québec. (2017). *Au Québec, on bouge en plein air!* https://www.education.gouv.qc.ca/fileadmin/site_web/documents/loisir-sport/Avis-plein-air.pdf
Government of Canada. (2020). *Parks Canada attendance 2019-20*. https://parks.canada.ca/docs/pc/attend#gn
Gravelle, F., & Deschênes, G. (2004). Spiritual development through play in the outdoors: A look at the scout movement. *Pathways: The Ontario of Outdoor Education*, *16*(4), 22-25.
Gray, T., Norton, C., Breault-Hood, J., Christie, B., Taylor, N. (2018). Curating a Public Self: Exploring Social Media Images of Women in the Outdoors. *Journal of Outdoor Recreation, Education, and Leadership*, *10*(2), 153-170. https://doi.org/https://doi.org/10.18666/JOREL-2018-V10-I2-8191
Greenhow, C., & Askari, E. (2017). Learning and teaching with social network sites: A decade of research in K-12 related education. *Education and information technologies*, *22*, 623-645.
Greenhow, C., & Lewin, C. (2016). Social media and education: Reconceptualizing the boundaries of formal and informal learning. *Learning, media and technology*, *41*(1), 6-30.
Guerin, C., Aitchison, C., & Carter, S. (2020). Digital and distributed: learning and teaching doctoral writing through social media. *Teaching in Higher Education*, *25*(2), 238-254. https://doi.org/10.1080/13562517.2018.1557138
Gut, D. (2014). L'enseignement/apprentissage des langues étrangères en autonomie à l'aide des TICE. *Hal Open Science*, *hal-02162231*. https://doi.org/https://hal.sorbonne-universite.fr/hal-02162231/document
Hamid, S., Bukhari, S., Ravana, S. D., Norman, A. A., & Ijab, M. T. (2016). Role of social media in information-seeking behaviour of international students: A systematic literature review. *Aslib Journal of Information Management*, *68*(5), 643-666. https://doi.org/10.1108/AJIM-03-2016-0031
Harvey, K. (2013). *Encyclopedia of social media and politics*. Sage Publications.
Hashim, K. F., Rashid, A., & Atalla, S. (2018). Social Media for Teaching and Learning within Higher Education Institution: A Bibliometric Analysis of the Literature (2008-2018). *International Journal of Interactive Mobile Technologies*, *12*(7).

Hassell, L. A., Peterson, J., & Pantanowitz, L. (2021). Pushed across the digital divide: COVID-19 accelerated pathology training onto a new digital learning curve. *Academic pathology*, *8*, 2374289521994240.

Hendarman, A. F., & Cantner, U. (2018). Soft skills, hard skills, and individual innovativeness. *Eurasian Business Review : A Journal in Industrial Organization, Innovation and Management Science*, *8*(2), 139-169. https://doi.org/10.1007/s40821-017-0076-6

Henderson, B., & Potter, T. G. (2001). Outdoor Adventure Education in Canada: Seeking the Country Way In. *Canadian Journal of Environmental Education*, *6*, 225-242.

Hills, D., Thomas, Glyn. (2019). Digital technology and outdoor experiential learning. *Journal of Adventure Education*, *20*(2), 155-169. https://doi.org/https://doi.org/10.1080/14729679.2019.1604244

Hinton, S., & Hjorth, L. (2019). Understanding social media. *Understanding Social Media*, 1-232.

Hobbs, W. D. (2009). *An investigation of highly effective leaders in outdoor adventure programs using a multi-method approach*. Indiana University.

Hootsuite. (2023). *Dictionary of Social Media Terms*.

Hovardas, T. (2016). Primary school teachers and outdoor education: Varying levels of teacher leadership in informal networks of peers. *The Journal of Environmental Education*, *47*(3), 237-254.

Huddart, D., Stott, T., Huddart, D., & Stott, T. (2020). *What Is Adventure Tourism?* Springer.

Huebner, E. (2022). *Museum Education Through Social Media* [Thesis, Condordia University].

Huebner, E. (2022). TikTok and museum education: A visual. *International Journal of Education Through Art*, *18*(2). https://doi.org/https://doi.org/10.1386/eta_00095_1

Huebner, E. J. (2023). Museum Education Through Social Media. *Studies in Art Education*, *64*(4), 445-466.

Humberstone, B., Cooper, G., & Collins, D. (2022). Lifelong outdoor enthusiasts' engagement with nature-based activities later in life. *Journal of Adventure Education and Outdoor Learning*, 1-12.

Hur, K., Kim, T. T., Karatepe, O. M., & Lee, G. (2017). An exploration of the factors influencing social media continuance usage and information sharing intentions among Korean travellers. *Tourism management*, *63*, 170-178. https://doi.org/10.1016/j.tourman.2017.06.013

Innocenti, P., Hyatt, E., & Harvey, M. (2022). Hiker on trail: Information practices in the wild. A mixed methods approach to investigate real-time mobile technology use by long-distance backpackers. *Library & Information Science Research*, *44*(4), 101200.

Inukollu, V. N., Keshamoni, D. D., Kang, T., & Inukollu, M. (2014). Factors influencing quality of mobile apps: Role of mobile app development life cycle. *arXiv preprint arXiv:1410.4537*.

Janowski, I., Gardiner, S., & Kwek, A. (2021). Dimensions of adventure tourism. *Tourism Management Perspectives*, *37*. https://doi.org/10.1016/j.tmp.2020.100776

Jeffs, T., & Ord, J. (2017). *Rethinking outdoor, experiential and informal education: Beyond the confines*. Routledge.

Jenkins, J. M., & Pigram, J. J. J. (2003). *Encyclopedia of leisure and outdoor recreation*. Routledge. http://public.eblib.com/choice/publicfullrecord.aspx?p=200049

Jensen, C. R., & Guthrie, S. (2006). *Outdoor recreation in America*. Human Kinetics.

Johnson, C. M. (2001). A survey of current research on online communities of practice. *The internet and higher education*, *4*(1), 45-60.

Joshi, A., Kale, S., Chandel, S., & Pal, D. K. (2015). Likert scale: Explored and explained. *British Journal of Applied Science & Technology*, *7*(4), 396.

Jukes, S., & Lynch, J. (2024). Digital technology and environmental pedagogies in tertiary outdoor education: linking digital spaces to more-than-human places. *Journal of Adventure Education and Outdoor Learning*, *24*(1), 108-122. https://doi.org/10.1080/14729679.2023.2230502

Kilyeni, A. (2015). Likes, tweets and other "friends": social media buzzwords from a terminology perspective. *Procedia-Social and Behavioral Sciences*, *192*, 430-437.

Kotut, L., Horning, M., Stelter, T. L., & McCrickard, D. S. (2020). Preparing for the unexpected: community framework for social media use and social support by trail thru-hikers. (p. 1-13). Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems,

Krumm, J., Davies, N., & Narayanaswami, C. (2008). User-generated content. *IEEE Pervasive Computing*, *7*(4), 10-11.
Kumar, P., & Gruzd, A. (2019). Social media for informal learning: A case of# Twitterstorians.
Kuru, I. E. P. a. J. (2010). Outdoor Activities as a Basis for Environmental Responsability. *The Journal of Environmental Education*, *31*(4), 32-36. https://doi.org/https://doi.org/10.1080/00958960009598649
Kvasnička, T. (2007). Equipment and changing outdoor culture in the Czech Republic. *Anthropology of East Europe Review*, *25*(1), 53-63.
Laing, J. H., & Crouch, G. I. (2009). Myth, adventure and fantasy at the frontier: Metaphors and imagery behind an extraordinary travel experience. *International Journal of Tourism Research*, *11*(2), 127-141.
Lavigne, M.-A. (2007). Les activités en plein air au Québec: participation et contributions économiques. *Bulletin de l'Observatoire québécois du loisir*, *4*(11).
Leather, M., & Gibson, K. (2019). The consumption and hyperreality of nature: Greater affordances for outdoor learning. *Curriculum perspectives*, *39*(1), 79-83.
Legendre, R. (2005). *Dictionnaire actuel de l'éducation* (3rd éd.). Guérin.
Lewis, P., & Kimiecik, J. (2018). Embracing the mystery box: how outdoor leaders discover and sustain their way of life. *Journal of Outdoor Recreation, Education, and Leadership*, *10*(4).
Luckmann, C. (1996). Defining Experiential Education. *Journal of Experiential Education*, *19*(1), 6-7.
Mackenzie, S. H., Schwab, K., Higgins, L., Greenwood, P. B., Goldenberg, M., Greenwood, J., & Hendricks, W. W. (2017). From social media to the outdoors: Exploring messages that connect with underserved urban youth. *Journal of Outdoor Recreation, Education, and Leadership*, *9*(2).
Mann, J., Gray, T., Truong, S., Sahlberg, P., Bentsen, P., Passy, R., Ho, S., Ward, K., & Cowper, R. (2021). A systematic review protocol to identify the key benefits and efficacy of nature-based learning in outdoor educational settings. *International journal of environmental research and public health*, *18*(3), 1199.
Martin, B., Breunig, M., Wagstaff, M., & Goldenberg, M. (2017). *Outdoor leadership : theory and practice*. Human Kinetics.
McCammon, I. (2000). The role of training in recreational avalanche accidents in the United States. (p. 37-45). Proceedings of the international snow science workshop, Big Sky Montana.
McKenzie, M. (2003). Beyond "the Outward Bound process:" Rethinking student learning. *Journal of Experiential Education*, *26*(1), 8-23.
Medina, J. J. (2004). *An exploration of master outdoor leaders' professional development experiences outside of institutional training*. University of Northern Colorado.
Meier, J. (1984). Minimizing Accidents and Risks in High Adventure Outdoor Pursuits.
Mercure, C. (2021). Le concept du plein air au Québec, enjeux épistémologiques et terminologiques. *Nature et Récréation*(10), 14-27.
Mercure, C. (2022). Éducation et plein air. In A. Denis, R. Romain and A. Jean-Marc (Eds.) *Plein air : manuel réflexif et pratique* (p. 159-177). Hermann. https://doi.org/10.3917/herm.roult.2020.01.0159.
Mercure, C. (2023). Origins and foundations of outdoor learning in Canada. In S. Priest, S. Ritchie and H. Ghadery (Eds.) *Outdoor Learning in Canada*. http://olic.ca.
Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research : a guide to design and implementation* (Fourth edition. éd.). Jossey-Bass, A Wiley Brand.
Midgley, L. (2014). The benefits and drawbacks of using technology in outdoor education. *Mount Royal Undergraduate Education Review*, *1*(1).
Miles, J. C., & Priest, S. (1999). *Adventure Programming*. ERIC.
Moll, R., & Nielsen, W. (2017). Development and validation of a social media and science learning survey. *International Journal of Science Education, Part B*, *7*(1), 14-30.
Morgan, D., & Fluker, M. (2003). Risk management for Australian commercial adventure tourism operations. *Journal of Hospitality and Tourism Management*, *10*(1), 46-60.

Morrissey, M. P., & Rossi, R. M. (2013). Clothing systems for outdoor activities. *Textile Progress*, *45*(2-3), 145-181.
Moseholm, E., & Fetters, M. D. (2017). Conceptual models to guide integration during analysis in convergent mixed methods studies. *Methodological Innovations*, *10*(2). https://doi.org/10.1177/2059799117703118
Nash, R. F. (2014). *Wilderness and the American mind*. Yale University Press.
Neill, J. T., & Richards, G. E. (1998). Does outdoor education really work? A summary of recent meta-analyses. *Journal of Outdoor and Environmental Education*, *3*(1), 2-9.
O'Brien, L. (2009). Learning outdoors: the Forest School approach. *Education 3–13*, *37*(1), 45-60.
O'Farrell, P., & Liu, H.-L. (2020). Gateway to outdoors: Partnership and programming of outdoor education centers in urban areas. *Education Sciences*, *10*(11), 340.
Oppenheim, A. N. (2000). *Questionnaire design, interviewing and attitude measurement*. Bloomsbury Publishing.
Outdoor Council of Canada. (2023). *Outdoor Training Orgazinations*. Outdoor Council of Canada.
Ozturk, P., Li, H., & Sakamoto, Y. (2015). Combating rumor spread on social media: The effectiveness of refutation and warning. (p. 2406-2414). 2015 48th Hawaii international conference on system sciences, IEEE.
Pabel, A., & Prideaux, B. (2016). Social media use in pre-trip planning by tourists visiting a small regional leisure destination. *Journal of Vacation Marketing*, *22*(4), 335-348.
Palmer, C. (2004). *Death, danger and the selling of risk in adventure sports*. Routledge.
Payne, P., & Wattchow, B. (2008). Slow pedagogy and placing education in post-traditional outdoor education. *Australian Journal of Outdoor Education*, *12*(1), 25-38.
Picciano, A. G., Seaman, J., & Allen, I. E. (2010). Educational transformation through online learning: To be or not to be. *Journal of Asynchronous Learning Networks*, *14*(4), 17-35.
Plant, R. (2004). Online communities. *Technology in society*, *26*(1), 51-65.
Pomfret, G. (2006). Mountaineering adventure tourists: a conceptual framework for research. *Tourism management*, *27*(1), 113-123.
Potthast, M., Köpsel, S., Stein, B., & Hagen, M. (2016). Clickbait detection. (p. 810-817). Advances in Information Retrieval: 38th European Conference on IR Research, ECIR 2016, Padua, Italy, March 20–23, 2016. Proceedings 38, Springer.
Povilaitis, V., Riley, M., DeLange, R., Verkouw, AJ., Hodge, C. (2019). Instructor Impacts on Outdoor Education Participant Outcomes: A Systematic Review. *Journal of Outdoor Recreation, Education and Leadership*, *11*(3), 222-238. https://doi.org/https://doi.org/10.18666/JOREL-2019-V11-I3-9581
Poynter, R. (2010). *The handbook of online and social media research: Tools and techniques for market researchers*. John Wiley & Sons.
Priest, S. (1987). An international survey of outdoor leadership preparation. *Journal of Experiential Education*, *10*(2), 34-39.
Priest, S. (1992). Factor exploration and confirmation for the dimensions of an adventure experience. *Journal of Leisure Research*, *24*(2), 127-139.
Priest, S. (2024). Predicting the future of experiential and adventurous learning in the metaverse. *Journal of Adventure Education and Outdoor Learning*, *24*(1), 21-34. https://doi.org/10.1080/14729679.2023.2220835
Priest, S., & Gass, M. (2018). *Effective leadership in adventure programming, 3E*. Human Kinetics.
Purc-Stephenson, R. J., Rawleigh, M., Kemp, H., Asfeldt, M.,. (2019). We Are Wilderness Explorers: A Review of Outdoor Education in Canada. *Journal of Experiential Education*, *24*(4). https://doi.org/Ds:O//dIo: i1.o0r.g1/107.171/1770/513058328529519919886655574
Qiu, L., Lu, J., Yang, S., Qu, W., & Zhu, T. (2015). What does your selfie say about you? *Computers in Human Behavior*, *52*, 443-449.
Quan-Haase, A., & Sloan, L. (2022). *The SAGE handbook of social media research methods*. Sage.
Raffan, J., & Horwood, B. (1988). *Canexus: The canoe in Canadian culture*. Dundurn.

Rantala, O., Hallikainen, V., Ilola, H., & Tuulentie, S. (2018). The softening of adventure tourism. *Scandinavian Journal of Hospitality and Tourism*, *18*(4), 343-361. https://doi.org/10.1080/15022250.2018.1522725

Reed. (2021). What is the Postdigital? Why might it matter for outdoor experiential education. *The Ontario Journal of Outdoor Education*, *33*(2), 28-31.

Reed, van Kraalingen, I., & Hills, D. (2022). Call for papers for special issue on digital technology and networked spaces in adventure education and outdoor learning. *Journal of Adventure Education and Outdoor Learning*, 1-2.

Reed, J., van Kraalingen, I., & Hills, D. (2024). Journal of adventure education and outdoor learning: special issue: digital technology and networked spaces in outdoor learning. *Journal of Adventure Education and Outdoor Learning*, *24*(1), 1-6. https://doi.org/10.1080/14729679.2024.2316444

Rehm, M., Manca, S., Brandon, D. L., & Greenhow, C. (2019). Beyond disciplinary boundaries: Mapping educational science in the discourse on social media. *Teachers College Record*, *121*(14), 1-24.

Reja, U., Manfreda, K. L., Hlebec, V., & Vehovar, V. (2003). Open-ended vs. close-ended questions in web questionnaires. *Developments in applied statistics*, *19*(1), 159-177.

Remmen, K. B., & Iversen, E. (2022). A scoping review of research on school-based outdoor education in the Nordic countries. *Journal of Adventure Education and Outdoor Learning*, 1-19.

Réseau de plein air Québec. (2023). *La mission de notre réseau : Propulser le plein air au Québec*. https://reseaupleinair.quebec/

Rice, W. L., Mateer, T. J., Reigner, N., Newman, P., Lawhon, B., & Taff, B. D. (2020). Changes in recreational behaviors of outdoor enthusiasts during the COVID-19 pandemic: analysis across urban and rural communities. *Journal of Urban Ecology*, *6*(1), juaa020.

Rogers, A. (2014). *The base of the iceberg : informal learning and its impact on formal and non-formal learning*. Barbara Budrich Publishers. https://doi.org/10.3224/84740632

Rogoff, B., Callanan, M., Gutiérrez, K. D., & Erickson, F. (2016). The organization of informal learning. *Review of Research in education*, *40*(1), 356-401.

Rothkrantz, L. (2015). How social media facilitate learning communities and peer groups around MOOCS. *International Journal of Human Capital and Information Technology Professionals (IJHCITP)*, *6*(1), 1-13.

Rowell, C. (2019). *Social Media in Higher Education: Case Studies, Reflections and Analysis*. Open Book Publishers.

Salmon, P., Williamson, A., Lenné, M., Mitsopoulos-Rubens, E., & Rudin-Brown, C. M. (2010). Systems-based accident analysis in the led outdoor activity domain: application and evaluation of a risk management framework. *Ergonomics*, *53*(8), 927-939.

Schäffer, S. D., & Kistemann, T. (2012). German forest kindergartens: Healthy childcare under the leafy canopy. *Children Youth and Environments*, *22*(1), 270-279.

Schimmele, C., Fonberg, J. D., & Schellenberg, G. (2021). *Canadians' Assessments of Social Media in Their Lives*. Statistics Canada= Statistique Canada.

Selwyn, N. (2012). Social media in higher education. *The Europa world of learning*, *1*(3), 1-10.

Shooter, W., Sibthorp, J., & Paisley, K. (2009). Outdoor leadership skills: A program perspective. *Journal of Experiential Education*, *32*(1), 1-13.

Shu, K., Sliva, A., Wang, S., Tang, J., & Liu, H. (2017). Fake news detection on social media: A data mining perspective. *ACM SIGKDD explorations newsletter*, *19*(1), 22-36.

Shultis, J. (2012a, 2015). "Completely Empowering": A Qualitative Study of the Impact of Technology on the Wilderness Experience in New Zealand. *USDA Forest Service Proceedins*, *RMRS*(P-74), 110-118.

Shultis, J. (2012b). The impact of technology on the wilderness experience: A review of common themes and approaches in three bodies of literature. *Wilderness visitor experiences: Progress in research and management*, 110-118.

Siemens, G. (2004). Connectivism. *Foundations of learning and instructional design technology*.

Smith, Parks, R., Parrish, J., & Swirski, R. (2016). Disruptive silence: deepening experiential learning in the absence of technology. *Journal of Adventure Education and Outdoor Learning*, *18*(1), 1-14. https://doi.org/https://doi.org/10.1080/14729679.2016.1244646
Smith, A., Rainie, L., & Zickuhr, K. (2011). College students and technology.
Sourina, O., Wortley, D., & Kim, S. (2015). *Subconscious learning via games and social media*. Springer.
Stahl, C. C., & Literat, I. (2022). # GenZ on TikTok: the collective online self-Portrait of the social media generation. *Journal of Youth Studies*, 1-22.
Statistics Canada. *Table 17-10-0009-01 Population estimates, quarterly* https://doi.org/https://doi.org/10.25318/1710000901-eng
Statistics Canada. (2015). *Canadians and nature - outdoor activities, 2013*. Statistics Canada. https://oaresource.library.carleton.ca/wcl/2016/20160817/16-508-x2015003-eng.pdf
Statistics Canada. (2018). *Canadians and the outdoors*. Récupéré le 28/03/2024 de
Statistics Canada. (2020). *Canadian Internet Use Survey*. https://www150.statcan.gc.ca/n1/daily-quotidien/210622/dq210622b-eng.htm
Statistics Canada. (2021). *Participation in outdoor activities*. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810012101
Stebbins, R. A. (2001). *Exploratory research in the social sciences* (vol. 48). Sage.
Stephens, M., Yoo, J., Mourao, R. R., Vu, H. T., Baresch, B., & Johnson, T. J. (2014). How app are people to use smartphones, search engines, and social media for news?: Examining information acquisition tools and their influence on political knowledge and voting. *Journal of Information Technology & Politics*, *11*(4), 383-396.
Sung, H. H., Morrison, A. M., & O'Leary, J. T. (1996). Definition of adventure travel: Conceptual framework for empirical application from the providers' perspective. *Asia Pacific journal of tourism research*, *1*(2), 47-67.
Sureté du Québec. (2022). *Votre demande en vertu de la Loi sur l'accès aux documents des organismes publics et sur la protection des renseignements personnels (c. A-2.1) concernant les missions héliportées de sauvetage et de recherche.*
Szeto, E., Cheng, A. Y.-N., & Hong, J.-C. (2016). Learning with social media: How do preservice teachers integrate YouTube and social media in teaching? *The Asia-Pacific Education Researcher*, *25*, 35-44.
Thomas. (2005). Traditional adventure activities in outdoor environmental education. *Journal of Outdoor and Environmental Education*, *9*, 31-39.
Thomas, S., & Raymond, C. (1998). Risk and provider responsibility in outdoor adventure activities. *Teacher Development*, *2*(2), 265-281. https://doi.org/10.1080/13664539800200054
Towner, T. L., & Muñoz, C. L. (2022). A Long Story Short: An Analysis of Instagram Stories during the 2020 Campaigns. *Journal of Political Marketing*, *21*(3-4), 221-234.
Tranquard, M., & Bourbeau, A.-F. (2014). Gestion des risques en tourisme d'aventure: proposition d'un outil d'évaluation du potentiel de survie en forêt. *Téoros: revue de recherche en tourisme*, *33*(1), 99-108.
Trans Canada Trail. (2021). *National Léger Survey finds trail use has increased 40% in 2021*. https://tctrail.ca/news/national-leger-survey-finds-trail-use-has-increased-40-in-2021/
Tussyadiah, I. P., & Fesenmaier, D. R. (2009). Mediating tourist experiences: Access to places via shared videos. *Annals of tourism research*, *36*(1), 24-40.
van Kraalingen, I. (2021). A systematized review of the use of mobile technology in outdoor learning. *Journal of Adventure Education and Outdoor Learning*, 1-19.
van Kraalingen, I., Hills, D., Reed, J., Beames, S., & Munge, B. (2022). Digital technology and networked spaces in outdoor education: reflections upon presenting at an international webinar. *Journal of Adventure Education and Outdoor Learning*, 1-14.
Van Looy, A. (2016). Social media management. *Advanced Database Marketing: Innovative Methodologies and Applications for Managing Customer Relationships. http://link. springer. com/10.1007/978-3-319-21990-5*.

Vannette, D. L., & Krosnick, J. A. (2017). *The Palgrave handbook of survey research*. Springer.
Venkatesh, V. E., Wallin, J. J., Castro, J. C. E., & Lewis, J. E. E. (2014). *Educational, psychological, and behavioral considerations in niche online communities*. Information Science Reference/IGI Global.
Waite, S., Bølling, M., & Bentsen, P. (2016). Comparing apples and pears?: a conceptual framework for understanding forms of outdoor learning through comparison of English Forest Schools and Danish udeskole. *Environmental education research*, *22*(6), 868-892.
Wattchow, B., & Brown, M. (2011). *A pedagogy of place: Outdoor education for a changing world*. Monash University Publishing.
Watters, R. (1985). Historical Perspectives of Outdoor and Wilderness Recreation Programming in the United States.
Wenger, E. (2011). Communities of practice: A brief introduction.
Wenger, E., McDermott, R. A., & Snyder, W. (2002). *Cultivating communities of practice: A guide to managing knowledge*. Harvard business press.
Whiting, A., & Williams, D. (2013). Why people use social media: a uses and gratifications approach. *Qualitative market research: an international journal*.
Wilson, A. (2011). The Handbook of Online and Social Media Research. *International Journal of Market Research*, *53*(5), 725-726.
Wyrwoll, C., & Wyrwoll, C. (2014). *User-generated content*. Springer.
Xiang, Z., & Gretzel, U. (2010). Role of social media in online travel information search. *Tourism management*, *31*(2), 179-188.
Yaşar, Ö., & Karadeniz, Ş. (2011). The power of social media in informal learning. *Education in a Technological World: Communicating Current and Emerging Research and Technological Efforts, Formatex, Badajoz*, 531-538.
Yildiz, K. (2022). Experiential learning from the perspective of outdoor education leaders. *Journal of Hospitality, Leisure, Sport & Tourism Education*, *30*. https://doi.org/10.1016/j.jhlste.2021.100343
Yunus, M. M., Salehi, H., & Chenzi, C. (2012). Integrating social networking tools into ESL writing classroom: Strengths and weaknesses. *English language teaching*, *5*(8), 42-48.
Zeng, B., & Gerritsen, R. (2014). What do we know about social media in tourism? A review. *Tourism Management Perspectives*, *10*, 27-36. https://doi.org/10.1016/j.tmp.2014.01.001
Zhao, Y., & Zhang, J. (2017). Consumer health information seeking in social media: a literature review. *Health Information & Libraries Journal*, *34*(4), 268-283.
Zucco, R., Lavano, F., Anfosso, R., Bianco, A., Pileggi, C., & Pavia, M. (2018). Internet and social media use for antibiotic-related information seeking: Findings from a survey among adult population in Italy. *International journal of medical informatics*, *111*, 131-139.