**Coventry University** 



# DOCTOR OF PHILOSOPHY

# "More from a week in the Alps than they experience in school" Exploring ski readiness in UK secondary schools

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Award date: 2020

Awarding institution: Coventry University

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# "More from a week in the Alps than they experience in school"

# Exploring Ski Readiness in UK Secondary Schools

By

# **Michelle Evans**

PhD

July 2019



# "More from a week in the Alps than they experience in school"

# Exploring Ski Readiness in UK Secondary Schools

Ву

**Michelle Evans** 

July 2019



A thesis submitted in partial fulfilment of the University's requirements for the Degree of Doctor of Philosophy

#### Acknowledgements

I would like to thank all the people who have made it possible for me to complete my thesis as this has been a life changing experience. To the School of Life Sciences, Coventry University in funding me to complete my PhD. Thank you to all the school teachers who took part in this research. Without your input and shared experiences this would not have been possible.

To Professor Jane Coad who inspired this research. Being my first Director of Studies who motivated and guided me along this research topic. Thank you for your support and knowledge into mixed methods research. I would like to show my appreciation to Professor Mike Duncan who was also my Director of Studies. You have always believed in me since I started my masters at Coventry University in 2010. Thank you for encouraging me to present my work at conferences and facilitate my research publications. I am privileged that I had you both as my Director of Studies. To Dr Mike Price my third supervisor, thank you for your continued support and advice throughout. You have been invaluable in providing feedback which has enhanced the quality of my work. A special thanks to Sheila Leddington Wright, you have been a colleague, mentor, supervisor and friend. It has been a pleasure undertaking this PhD journey with you, as I would have never of completed it without your guidance and endless encouragement throughout. Finally, to my work colleagues for their constant support, encouragement and belief in my ability. I feel privileged to be part of the team.

A heart felt thank you to all my family, especially Mum, Dad, Lisa and Pat for your understanding and support throughout the duration of the PhD. To Gerard Evans my constant support with his endless patience and encouragement. We have undergone many life changes throughout this period. Gerard my husband and Sophie our daughter, this thesis is dedicated to you.

II

Presentation of results

The following publications and presentations have resulted from the work in this thesis.

# Chapter 5:

**Stanley, M.,** Duncan, M.J., Price, M., Leddington Wright, S. and Coad, J. (2013) 'The compulsory use of helmets on school ski trips'. Poster presentation at International Sports Science and Sports Medicine Conference, Newcastle (22<sup>nd</sup> August 2013). Published in *British Journal of Sports Medicine* 47 (17), e4. Available from <u>http://dx.doi.org/10.1136/bjsports-2013-093073.36</u>

**Stanley, M.,** Price, M., Duncan, M.J., Leddington Wright, S. and Coad, J. (2013) Investigating Physical Preparation for School Ski Trips in England. Poster presentation at 6<sup>th</sup> International Congress on Science and Skiing, St. Christoph am Arlberg - Austria (14<sup>th</sup>-19<sup>th</sup> December 2013)

**Stanley, M.,** Price, M., Duncan, M.J., Leddington Wright, S. and Coad, J. (2013) Investigating Ski Readiness on Secondary School Trips in England. Oral presentation at 6<sup>th</sup> International Congress on Science and Skiing, St. Christoph am Arlberg - Austria (14<sup>th</sup>-19<sup>th</sup> December 2013)

**Stanley, M.,** Price, M., Duncan, M.J., Leddington Wright, S. and Coad, J. (2015) 'Investigating ski readiness on secondary school ski trips in England'. In *Science and Skiing VI.* ed. by Müller, E., Kröll, J., Lindinger, S., Pfusterschmied, J. and Stöggl, T. UK: Meyer and Meyer Sport, 309-315

**Stanley, M**., Duncan, M. J., Price, M., Leddington Wright, S. and Coad, J. (2017) 'Exploring the Preparation Practices of Teachers Who Organise Secondary School Ski Trips in England and Wales' *Journal of Risk Research*, 1-12. Available from <u>https://doi.org/10.1080/13669877.2017.1378245</u>

# Chapter 6:

**Stanley, M.,** Duncan, M.J., Leddington Wright, S. Price, M., and Coad, J. (2016) Exploring the value and preparation of school ski trips through the voice of organisers. Oral presentation at BASES, East Midlands Conference Centre, England (29<sup>th</sup>-30<sup>th</sup> November 2016). Published in *Journal of Sports Sciences*, 34:sup1, s4-5. Available from <a href="https://doi.org/10.1080/02640414.2016.1260807">https://doi.org/10.1080/02640414.2016.1260807</a>

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#### Abstract

#### Introduction

The benefits of school ski trips are multifaceted and involve physical activity that exposes young people to winter conditions and mountainous environments. However, young people are the most commonly injured population within skiing. The success of school trips is related to teacher's prior knowledge of skiing excursions in conjunction with the goodwill of teachers to organise and facilitate these. Currently, in the United Kingdom, there are no mandatory guidelines for teachers. Arguably, the first step is to benchmark current school practices and identify if these practices have been implemented across schools in England and Wales. The overall aim of this thesis is to explore the preparation practices prior to and during school ski trips using a mixed methods approach.

#### Methods

Following ethics approval and informed consent, 3014 secondary schools across England and Wales were contacted by email regarding ski trip practices. The objectives were to explore the preparation practices prior to and during the ski trip and to identify if these practices were consistent across England and Wales. This initial quantitative study involved an electronic survey containing 32 questions on demographic data, contextual information on the school, information concerning ski trip preparation, common practices occurring on the piste and attitudinal questions to gather information on ski trip practices. A total of 270 schools across England and Wales completed the survey. Descriptive statistical methods were used to calculate the percentage response rate for each question and Chi-squared ( $\chi^2$ ) tests to identify statistical significance. Statistical analysis of the data was conducted using IBM SPSS statistics for windows (Armonk, NY: IBM Corp), version 20. The statistical significance was set at 95% (*P* < 0.05) level of confidence.

In the subsequent qualitative study, from the 270 respondents that had completed the online survey, 172 of these respondents agreed to further followup communication. All 172 respondents were contacted through email and 20 participants consented to telephone interviews. The objective was to gather the reflective experiences from teachers in the organisation of school ski trips. Semi-structured telephone interviews were conducted with teachers (n = 20) across England and Wales. Thematic analysis was used to identify key themes across all interviews using NVivo 10, qualitative software package (QSR International Pty Ltd, 2015).

Quantitative and qualitative data were collected sequentially and synthesised using methodological triangulation. A meta matrix developed the meta inferences which provided completeness and confirmation of the findings. Recommendations and advice were drawn from the findings to provide guidelines for those responsible in organising school ski trips.

### Results

The survey results found no significant differences across region or school type in relation to the organisation of the school ski trip. Young people were informed about similar information prior to departing and whilst at the ski resort across the regions (P > 0.05). Inconsistent responses were found regarding prior ski lessons, screening pupils, physical preparation and knowledge of organising trips. There was a difference in opinion about legal action being a consideration when organising the trip and having concerns about injuries whilst on the trip.

Following the interviews, four main themes were identified; "teacher preparation", "preparation prior to the trip", "activities and information during the trip" and "benefits and barriers of school ski trips". The findings have drawn together the various barriers and obstacles that school trip teachers encounter to enable young people to experience the thrill of skiing.

The synthesised findings from the two studies provided a comprehensive overview of school ski trip practices in Endland and Wales. This facilitated in providing evidence-based practice guidelines to inform policy and provide general recommendations for future best practice.

# Conclusion

School ski trips have an unquestionable value in young people's lives. Teachers are delivering some consistent messages across England and Wales to prepare young people for these trips. The implications of these findings are that all new teachers should obtain propositional knowledge through specialised ski courses for the management of school ski trips. One recommendation is that a central database is developed which contains relevant information to guide teachers in the management of a school ski trip. To facilitate in the knowledge transfer, mobile telephone applications could be a novel method to disseminate knowledge to both teachers and pupils.

# Key words

Secondary school trips, ski trips, teacher preparation, risk reduction, outdoor adventure activity.

# Chapter 1: Introduction

### 1.1 Thesis overview

Skiing is an atypical activity within England and Wales for several reasons, including the lack of accessibility to a ski piste and the financial burden. Secondary schools across the United Kingdom (UK) have enabled skiing to become more inclusive by providing opportunities for young people (aged 11-16 years) to experience skiing on school trips. However, the characteristics of skiing are unique compared to other physical activities<sup>1</sup> (PA) undertaken in schools. Consequently, to reduce risk of injury, young people should be adequately prepared for the demands of the activity whilst in an alpine environment. Using a mixed method approach this thesis explores the preparation practices of teachers taking young people on school ski trips. It is anticipated that this thesis will contribute to the increasing body of knowledge of the multifactorial risk factors that are present in skiing. This thesis will provide recommendations that may be of interest to schools, school tour operators, local governments and health and safety executives that plan school ski trips for young people. More broadly these recommendations could translate to other residential, outdoor and adventurous trips.

# 1.2 Rationale

The nature of skiing is uncharacteristic to other PA undertaken within schools across England and Wales and is classified as a high-risk activity, this being, may increase the vulnerability of young people being injured (McBeth et al. 2009; Parkkari, Kujala and Kannus 2001). Young people have the highest incidence of ski related injuries (Sulheim et al. 2011) which can be detrimental

<sup>&</sup>lt;sup>1</sup> "Physcial activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure" (Caspersen, Powell and Christenson 1985: 126).

to the pupils involved by reducing PA levels especially if catastrophic in nature (Carter 2011; Grimmer, Jones and Williams 2000). With this in mind, it is imperative that young people are prepared to meet the high demands that skiing places on the body. To the researcher's knowledge, there is limited information providing risk reduction strategies for young people attending school ski trips abroad. There is a general concern of the health and safety of pupils on school trips due to previous tragic accidents (Cramp 2008) and recommendations to safeguard young people would be viewed as beneficial to all those involved. It is anticipated that this thesis will generate knowledge about the preparation and practices which should occur on secondary school ski trips, ultimately to provide recommendations for the safe organisation of school ski trips.

# 1.3 Research aims

The overall aim of this thesis was to explore the preparation practices prior to and during school ski trips. This thesis will add new perspectives regarding current risk reduction practices used in secondary schools in England and Wales of pupils aged 11-16 years. A mixed methods approach and methodological triangulation will be used to synthesise data and thus make recommendations for school leaders, governing bodies and local authorities.

# 1.4 Research objectives

- 1) To explore the preparation practices prior to the school ski trip.
- 2) To explore the procedures during the school ski trip.
- To evaluate whether schools are consistent in their management across England and Wales.
- To explore if schools engage in any activities that reduce risks to young people during the trip.

- 5) To collate the reflective experiences of teachers in the processes around school ski trips.
- 6) To triangulate the evidence to develop recommendations to inform evidence-based practice.
- 7) To provide guidelines for future best practice to inform potential and current teachers organising ski trips.

# 1.5 Thesis structure

The literature review is organised into two chapters (Chapter two and three) (Figure 1.1) and grounds the context of the thesis to assist in the evolvement of the exploratory chapters (Chapter five and Chapter six). The work within this thesis is anchored in the theoretical model proposed by Meeuwisse et al. (2007) which is further discussed in Chapter three.



Figure 1.1 Thesis structure

The literature review contributed to the focus of the survey questions within Chapter five and the conclusions drawn from the quantitative survey study facilitated in the construction of the semi structured interview questions for Chapter six. Using a novel approach to critically answer the research aim, methodological triangulation synthesised the quantitative and qualitative studies to form recommendations (Figure 1.1).

In Chapter two, alpine skiing is discussed as part of the snow sports<sup>2</sup> continuum to acknowledge the different types of snow sports that exist together, recognising that certain styles of snow sports are more popular. The evolution of skiing emphasises the extensive changes and advancements of the activity. Through understanding how skiing has adapted over time, from being a necessity to aid survival and travel, to becoming a sport and recreational activity as we know it today, will enable the reader to appreciate the technological advancements skiing has encountered. The chapter also incorporates the constraints of the ski market and the significance of schools offering ski trip opportunities. Several organisations are highlighted which provide information to assist with planning ski trips and training teachers to become snow sport organisers. Trips that involve a high degree of risk, such as skiing, have the potential for injury. Therefore, the importance of remaining injury free and how injury can have a negative impact on the health in young people is explored. The consequences of injury are examined with respect to the impact on the direct and indirect costs to the young person. In addition, the importance of young people being exposed to a multitude of activities is considered, to experience an array of skills which can aid in the reduction of a sedentary lifestyle (Wojtyczek, Pasławska and Raschner 2014).

The following chapter (Chapter three) places the thesis within the context of wider literature around understanding injury risk factors associated with skiing. These factors are multifactorial relating to both intrinsic and extrinsic factors

<sup>&</sup>lt;sup>2</sup> "Sport means all forms of PA which, through casual or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels" (Council of Europe, 2001: Article 2).

(Macnab and Cadman 1996) with multiple participations potentially changing risk either positively or negatively (Meeuwisse et al. 2007). The chapter highlights that there is a paucity of research introducing risk reduction interventions for young skiers. The classification of skiing injuries has been reported to have changed alongside the evolution of skiing, possibly due to the changes in equipment and/or the methods of injury data collection. The aetiology of skiing considers which individuals may be at an increased risk of injury to understand the areas that need further exploration.

The methodology chapter (Chapter four) discusses the justification of methods used within the exploratory chapters (Chapters five and six) and the necessity to adopt a mixed method design for data collection. In Chapter five, a quantitative survey study addressed the research objectives (objectives one, two, three and four) to gain an understanding of the preparation practices of school ski trips and the consistency of this information across England and Wales.

Chapter six adopted a qualitative methodology to acquire reflective experiences from teachers, of the processes involved in the organisation of school ski trips (objective five). Subsequently, methodological triangulation (Chapter seven) was employed to synthesise the survey results (Chapter five) with the interview findings (Chapter six) providing the most comprehensive overview of school ski trip practices to date in the UK (objective six). The thesis concludes with a general discussion (Chapter eight) of findings and the application of processes for school ski trips with the implications for future research (objective seven). Finally, the researcher's reflections are included. Chapter 2: The context of skiing

#### 2.1 Alpine skiing

Snow sports which include skiing, snowboarding and tobogganing have become ever increasingly popular (Diamond, Gale and Denkhaus 2001; Hackam, Kreller and Pearl 1999; Sulheim et al. 2006). The most prevalent winter sports globally are alpine skiing and snowboarding where both activities coexist on the same piste, however these two sports differ in techniques, equipment and terminology (Bailey, Boon and Watson 2009). Skiing is an extremely popular activity in Europe, enjoyed by a broad spectrum of the population regardless of age, size, ability and fitness (Koehle, Lloyd-Smith and Taunton 2002; Pasławska, Wojtyczek and Raschner 2012). In terms of types of skiing there are a variety of styles which include: alpine (downhill), Nordic (cross-country) and telemark (free-heel skiing/pinning) (Bailey, Boon and Watson 2009; Kipp 2012). The most popular snow sport in the world is alpine skiing, which is the typical activity school trips engage in (Deibert et al. 1998; Hudson 1998; Koehle, Lloyd-Smith and Taunton 2002; Pasławska, Wojtyczek and Raschner 2012).

Alpine skiing is a well-established activity (Girardi et al. 2010) and involves the skier altering their angle of descent down the piste to control speed according to the steepness of the run (Dickson and Terwiel 2013). Alpine skiing requires prepared trails to be created in the land by grooming the snow, removing trees and controlling avalanches to allow the skier to manoeuvre over the ground safely. To add to the challenge, a piste is categorised according to difficulty, allowing the skier to choose a trail according to their skill level (Bailey, Boon and Watson 2009). As such, skiing requires knowledge and skill to negotiate the landscape and use the trails based on the individual's skill level.

# 2.2 Evolution of skiing

Throughout the evolution of skiing, it is evident as an activity it has undergone several changes with adaptions to equipment and terrain to enhance the ski experience (Formenti, Ardigò and Minetti 2005). In terms of history according to Chinese historical accounts the first written report of skiing dates back to 600<sub>AD</sub> (Hunter 1999; McCall and Safran 2009). Indeed, the ski pre-dates the wheel as one of the earliest modes of transportation where skiing was a necessity and a means to be able to live in mountainous areas rather than a sporting activity as we know it today (Allen 2011; Formenti, Ardigò and Minetti 2005). Designs of skis were initially basic but, through the development of technology, there have been varied materials used to develop the ski, although all have the same aim in making travel across the snow effortless (Kipp 2012). Before ski lifts, climbing up the mountain was the only method available to experience the downhill thrill of skiing. By the late 1920s a rope tow had been constructed to haul people back up the piste (Kipp 2012). Rope tows are still used today, although skiers often have the luxury of chairlifts and gondolas.

The ski industry expanded during the post-World War II era with emerging ski clubs and developing infrastructure which attracted visitors from all over the world (Podkalicka and Strobl 2019). The first official winter Olympics occurred in 1924 and featured cross country skiing, ski jumping, and Nordic combined (Hudson 1998). Since 1936 alpine skiing has been contested at every winter Olympics (Ferguson 2009) which helped with the expansion of skiing as a winter recreational activity (Hudson 1998).

There has been a plethora of research conducted within skiing over its history. Much of this work has involved the development of ski technology (Finch and Kelsall 1998; Formenti, Ardigò and Minetti 2005) alongside the physiology (Andersen and Montgomery 1988; Turnbull, Kilding and Keogh 2009) and injury profiles (Langran and Selvaraj 2002; Vidal et al. 2018) of skiers. Early research articles ought to be viewed with caution due to the extensive changes in ski technology over the years.

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#### 2.3 Ski market

Adventure tourism has become increasingly popular since the commercial development of alpine skiing during the mid-1950s (Finch and Kelsall 1998), with skiing encompassing beautiful scenery from the great outdoors alongside the health benefits from this lifestyle (Williams and Fidgeon 2000). The UK ski market has been described as an "upmarket holiday" where the main participants are those who "can afford at least two overseas holidays a year" (Richards and Friend 1995: 260). To become a proficient skier, you are required to invest a considerable amount of time on the piste, therefore, skiers with sufficient income and leisure time have arguably been able to ski more regularly and in turn increase their skill levels (Richards and Friend 1995; Richards 1996). Conversely, some non-skiers have perceived the commitment required to ski proficiently necessitates an investment in time and cost which restricted them from participating in skiing (Williams and Basford 1992). Intrapersonal factors, where interviewed non-skiers perceived skiing to be dangerous, hard to learn and they would get cold and wet from the activity influenced their decision not to participate (Gilbert and Hudson 2000). Furthermore, non-skiers perceived injury would result from several areas which included: learning to ski, manoeuvring on the piste and using the ski lifts (Williams and Basford 1992). Disability access and inclusion within the ski industry can also deter those with disabilities from seeking out these types of activities (Darcy 2012). Cost constraints and the fear of injury are the major factors preventing non-skiers from taking up the activity (Williams and Fidgeon 2000). If these barriers are not curtailed, this will hinder participation in this activity. Consequently, the effect of these constraints on participation has been identified to depend on how: structural (time, distance, money), intrapersonal (personality traits, characteristics, values, skills) and interpersonal (social interaction) factors are negotiated (Priporas et al. 2015).

Skiing is not a national sport within England and Wales and as such arguably is not commonly part of UK sporting culture. Access to natural snow in the UK is located within five ski resorts in Scotland where attendance is sensitive to

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snow conditions (Vanat 2019). In the UK, skiing is identified as an elitist PA where only the fortunate few can afford to participate (Podkalicka and Strobl 2019), consequently, skiing has not influenced the lives of a significant number of the population within the UK. At present there are 6.3 million UK skiers, which is approximately 10% of the UK population, in contrast to Austria and Germany where 34% and 18% of the population ski (Vanat 2019). To enable more of the UK population to experience and become familiar with skiing, albeit in an artificial environment, there are approximately fifty dry slopes and six indoor snow centres within the UK (Vanat 2019).

Young people aged 15-19 years constitute over a quarter of the ski population (Burtscher, Ruedl and Nachbauer 2013; Hudson 1998). With organised school trips significantly contributing to the overall numbers of young people experiencing skiing (Crystal 2012; Richards 1996). The largest source of future skiers is from school trips and 34% of respondents from the Crystal ski industry report have declared that their first ski experience was during a school ski trip (Crystal 2012). The Crystal ski industry report collates data from different sources<sup>3</sup> to provide information on the winter sports industry (Crystal 2014).

Despite the apparent value of school ski trips (section 2.4 and 2.5), educational reforms have prevented schools from subsidising the cost of ski trips and changes governing the supervision of young people outside the classroom have both contributed to the decline of school ski trips (Hudson 1998; Richards and Friend 1995; Richards 1996). Families have been financially challenged due to the economic downturn, impact of the recessions and high cost of participation thus being less able to afford to send their child on a school ski trip (Crystal 2012; Falk 2013). These factors have negatively impacted on introducing new UK young skiers to the ski market (Crystal 2012; Richards and Friend 1995). Skiing is an expensive activity with many additional costs to consider such as transportation, equipment, ski tuition, ski lift passes, accommodation, meals

<sup>&</sup>lt;sup>3</sup> Sources include tour operators' statistics, British Ski and Snowsport (BSS), airport passenger figures, published CAA statistics, tourist office data including the Observatoire National des Stations des Montagne and travel agency reporting (Crystal 2014).

and insurance appropriate to cover ski related issues, to name a few (Williams and Basford 1992). The ski market does favour those in an affluent position, although, a school trip may allow those who are unable to afford to send the whole family to send their child or children to experience this activity. This may encourage young people to maintain involvement in skiing into their adulthood or even introduce their families to the activity (Hudson 1998).

# 2.4 Benefits of school trips

Educational visits are an integral part of a considerable number of schools across the UK (HSE 2011) as those schools believe that they support and complement a pupil's understanding of the wider world outside the classroom (Anderson, Kisiel and Storksdieck 2006). A school trip can be described as a: field trip, a school excursion, a school journey, adventure based learning, an outdoor adventure activity (OAA) or a residential trip (Behrendt and Franklin 2014; Rickinson et al. 2004; Sutherland and Stuhr 2014). These school trips can be either curriculum based or extra curriculum based (Ritchie and Coughlan 2004) and allow pupils to experience a natural setting (Behrendt and Franklin 2014) which is important when learning outside the classroom (Malone 2008). Rickinson et al. (2004) suggests there is substantial evidence to indicate that knowledge and skills are developed whilst on school trips which add value to classroom experiences and are a key part of physical literacy (Higgs et al. 2008) (section 2.6). Specifically, this thesis concerns itself with extracurricular OAA which involve pupils being physically active away from their normal environment (Hattie et al. 1997).

Learning outside the classroom (LOtC) is an accepted notion of primary and secondary education (Rogers 2011), which was endorsed by "The Learning Outside the Classroom Manifesto" introduced in 2006 by the then Secretary of State for Education and Skills (Rogers 2011). The manifesto embraces the belief that "every young person should experience the world beyond the classroom as an essential part of learning and personal development, whatever

their age, ability or circumstances" (Learning Outside the Classroom Manifesto 2006: 2). This can be difficult to deliver when funding pupils to attend school trips is a large issue for many families or pupils have a disability.

The Council for Learning Outside the Classroom (CLOtC) is in support of young people attending school trips to facilitate in new learning opportunities (CLOtC 2008). The CLOtC is a registered charity that believes every young person is given the opportunity to access and experience life beyond the classroom environment (CLOtC 2020b), which exposes young people to real world learning, problem based learning and experiential learning which develops problem solving and critical skills (Malone 2008). This type of learning allows the young person to engage with alternative settings to complement or supplement the formal classroom curriculum (Malone 2008). Within the National Curriculum for Physical Education (NCPE), in key stages three and four, young people should be taught to "take part in outdoor and adventurous activities (OAA)" to develop team building, trust and problem solving (DfE (Department for Education) 2014: 104). Within the school curriculum, physical education (PE) is portrayed to act as a vehicle for enhancing PA through the life course (Green 2014) by inspiring pupils to become physically confident in a range of PA to support their health and physical fitness<sup>4</sup> (DfE 2014). Adventurous activities within the NCPE have been increasingly marginalised and should allow every pupil the chance to experience adventurous activities to encourage lifelong participation (Williams and Wainwright 2016). These adventure activities should detail what pupil learning can be expected to realign adventurous activities to the PE Curriculum (Williams and Wainwright 2016).

The Every Experience Matters report (Malone 2008), developed the evidence base for championing LOtC and was funded by the Department for Children, Schools and Families to support the LOtC manifesto (CLOtC 2020a). This report provides evidence of young people "achieving higher results in the

<sup>&</sup>lt;sup>4</sup> "Physical fitness is a set of attributes that people have or achieve" which fall into two groups; health related (cardiorespiratory endurance, muscular endurance/strength, body composition and flexibility) and/or skill related (Caspersen, Powell and Christenson 1985: 128).

knowledge and acquisition of skill; increasing their physical health and motor skills; socialising and interacting in new and different ways with their peers and adults; show improved attention, enhanced self-concept, self-esteem and mental health" (Malone 2008: 5). Learning outside the classroom in different environments impacts on the development of: cognitive (knowledge, understanding and skills acquisition); physical (physical fitness, motor skill development, coordination, and nutrition awareness); social (social skills, behaviour, engaging with others); emotional (mental health, self-esteem and self-concept) and personal domains (tolerance, resilience and empathy) (Amos and Reiss 2006; Malone 2008; Rickinson et al. 2004; Sutherland and Stuhr 2014). Using such evidence, school ski trips may have a positive long-lasting impact on these aforementioned areas similar to other OAA (Hattie et al. 1997).

# 2.5 Benefits of ski trips

International school trips are rewarding to both pupils and teachers and are often the most memorable and stimulating experience of their educational involvement (DfEE 1998; Dillon et al. 2006; Hunter-Jones and Hunter-Jones 2007). Ski trips are not part of the timetabled curriculum, they are an extracurricular activity which provide young people with challenges and adventure which some pupils may not have the opportunity to experience without school trip provisions (Johnston 2015). The CLOtC outlined four areas of learning opportunities that school trips create; improved health and fitness, personal and social development, being risk conversant and citizenship (CLOtC 2008; Sutherland and Stuhr 2014). By engaging in active school trips, such as skiing, teachers have observed young people to display enhanced motivation and self-confidence compared to within the classroom environment (Amos and Reiss 2006). Important life skills and personal development are achieved through school trips which contribute to an overall enhanced pupil experience (CLOtC 2006; HSE 2011). Adventurous activities such as skiing help to "build confidence, offer new experiences, provide insights into character and even transform lives", allowing young people to be driven beyond their existing

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competences (Gill 2010: 4). Skiing can be used to complement learning outside the classroom (LOtC) contributing to a broadened curriculum (Snowsport England 2011). Since not all pupils would want to or are able to attend a school ski trip, schools still provide OAA activities as part of the PE curriculum (DfE 2014). By providing a range of outside the classroom experiences throughout a young person's education the CLOtC (2006) have suggested this will enhance achievement in a range of subjects and have a positive impact on their future.

The Blair Labour government's initiative for England and Wales, Every Child Matters (DfE 2004), set out five outcomes that are key to the well-being for young people, which includes being healthy, staying safe, enjoying and achieving, making a positive contribution and achieving economic wellbeing. Snowsport England (2011) have emphasised how skiing supports these five outcomes and contributes to the pupils' education (Table 2.1). The outcomes within Table 2.1 highlight only the positive contribution skiing provides to the well-being of the young person with no identification of any negative consequences, the negative drawbacks such as injury are discussed in section 2.9.

Skiing is a sociable activity which can be enjoyed by all ages and abilities (Burtscher and Gerhard 2015; Williams and Fidgeon 2000) (Table 2.1). The social interaction experienced on a school trip is a fundamental feature that allows young people from different age groups to come together and develop interactions across the school years (DeWitt and Storksdieck 2008). These new friendship groups have been seen to continue at school and contribute to enhanced relationships (Amos and Reiss 2006). When on residential outdoor trips, teacher and pupil interactions have been described to be developed positively as they are able to work together in a more relaxed, open way allowing the pupils to learn more about the character of their teachers (Amos and Reiss 2006; Cramp 2008).

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**Table 2.1** How skiing contributes towards a more sustainable future - 'Every Child Matters' (SnowSport England 2011: 3)

Healthy	Stay Safe	Enjoy and Achieve	Make a positive Contribution	Achieve Economic Well- Being
<ul> <li>Encourage physical activity</li> <li>Improve coordination</li> <li>Build confidence</li> <li>Encourage healthy eating</li> <li>Encourage healthy lifestyle</li> <li>Look after self and others</li> <li>Foster independence</li> <li>Support emotional well-being</li> <li>Develop selfestem</li> </ul>	<ul> <li>Learn to assess risk</li> <li>Opportunity to make judgements and manage risk</li> <li>Develop new skills</li> <li>Learn skills for safe travel through an unfamiliar environment</li> <li>Understanding of and tolerance for others</li> <li>Residentials provide respite and space to change</li> <li>Challenge negative behaviour</li> </ul>	<ul> <li>Develop a lifelong PA</li> <li>Offering multi-sensory experiences</li> <li>Develop understanding of how individuals learn</li> <li>Experiences complement and reinforce other learning</li> <li>Accreditation of achievement</li> <li>Develops positive attitudes</li> <li>Opportunities for review and reflection</li> <li>Stimulates awe and wonder</li> <li>Develops key skills</li> <li>Develops personal qualities</li> <li>Increase self-esteem</li> </ul>	<ul> <li>Enjoy and value a natural environment</li> <li>Responsibility for the environment</li> <li>Awareness and understanding of different cultures</li> <li>Awareness of social interaction</li> <li>Teamwork development</li> <li>Opportunities for leadership</li> <li>Encourage decision making</li> <li>Push personal boundaries</li> <li>Develop a culture of sharing and volunteering</li> </ul>	<ul> <li>Provides a broad and balanced curriculum</li> <li>Helps make sustainable life choices</li> <li>Develops skills for life</li> <li>Provision of work experience</li> <li>Widens horizons</li> <li>Provides inspiration for working abroad as adults</li> <li>Supports curriculum- based learning</li> <li>Can assist re-integration of young people "at risk"</li> </ul>

From a recent review Burtscher (2019), suggests skiing contributes to fostering a healthy lifestyle, improved cardiovascular and musculoskeletal fitness, improved motor control and psychosocial wellbeing. The health benefits postulated from the review (Burtscher 2019) were from articles where skiing was performed on a regular basis and may not have similar benefits when completed over a short time frame. Promotion of wellbeing through PA, especially within natural environments, has been evidenced to have beneficial effects which is high on the health agenda especially in children (Jewett et al. 2014; Maller et al. 2005). The enjoyment of skiing could contribute to encouraging lifelong participation in this activity (Green, Smith and Roberts 2005) since there is now a shift towards individual and recreational activities compared to organised sport (Green 2014).

### 2.6 Exposure to different activities

Prior to puberty, young people should be exposed to as many different PA experiences as possible (Sheehan and Katz 2011) within academic institutions (Wojtyczek, Pasławska and Raschner 2014). This aids in the development of physical competence which generates significant health benefits, increases academic performance (Edwards et al. 2017) and contributes to maintaining a physically active lifestyle (Lundvall 2015). Since inactivity is a key public health issue, the promotion of a physically active lifestyle is important for the health of young people (Green 2014) and learning to move in different circumstances is a key facilitator of subsequent PA (Stodden et al. 2008).

Physical literacy is described as "the motivation, confidence, physical competence, knowledge and understanding to maintain PA throughout the life course" (Whitehead 2010: 5). To nurture physical literacy, it is particularly important to develop and have competence in fundamental movement skills (e.g., walk, run, jump, throw) and fundamental sport skills (e.g., catch, hop, gallop) (Ford et al. 2011; Higgs et al. 2008). From an early age (aged  $\leq$  12 years) it is desirable to promote the development of fundamental movement

skills; however, older children and adults may still be receptive to learning movement skills (Oliver and Lloyd 2012). This physical literacy is critical to support the confidence of engaging in an active lifestyle, which reduces potential withdrawal from PA or sport (Higgs et al. 2008). Young people can participate in a range of PA during and after school which gives them an opportunity to experience a repertoire of stimulating PA. This is fundamental to a young person's development in facilitating their enjoyment in at least one PA which they will be able to continue throughout life (Green, Smith and Roberts 2005).

These fundamental skills are learnt in four basic environments: ground, in the water, in the air and on the snow/ice (Higgs et al. 2008). However, within the English and Welsh school system, predominantly ground, air and water-based activities are performed (DfE 2013; Green, Smith and Roberts 2005). Skiing is an atypical PA within England and Wales which is not normally part of a young person's experience. For this reason, the fundamental movement skills suggested to be mastered on the snow (Higgs et al. 2008) are rarely achieved. Learning to ski provides a physical challenge where young people can learn new skills involving balance and movement (Snowsport England 2011). School ski trips enable young people to develop the fundamental skills on the snow albeit from a latter age than their European counterparts. In comparison to other activities learnt within timetabled PE sessions, the motor skills in skiing is typically learnt over a shorter timeframe during intensive sessions although rapid improvements of a skill can be achieved within a single training session and retained over an extended period of time (Dayan and Cohen 2011; Savion-Lemieux and Penhune 2005). In the UK, dry and artificial slopes have enabled far more people to participate in this activity (section 2.3).

#### 2.7 Teacher constraints in organising trips

To implement school ski trips, teachers face many challenges which can impact on their willingness to execute these types of trips. Teachers have faced challenges in developing and implementing other field trip activities which have come from funding restrictions, insufficient support from administrators or colleagues, time constrictions, liability, risk management constraints and inadequate skills and qualifications to implement trips (Anderson, Kisiel and Storksdieck 2006, Cramp 2008, Comishin et al. 2004, DeWitt and Storksdieck 2008, Stan and Humberstone 2011). Reported challenges have been the laborious aspect of administration in organising trips alongside their contractual workplace commitments and negotiating complex regulations impacting on teacher's commitment to implement such trips (Hunter-Jones 2007; Johnston 2015). The logistics, in terms of receiving parental<sup>5</sup> consent and ensuring health and safety forms have been completed, all impact on the time pressures teachers are now facing within the curriculum (Dewitt 2008).

Outdoor adventure activities have seen a decline since 1993 when the Lyme Bay canoeing tragedy occurred (Cramp 2008). Since this tragedy it has been acknowledged that risk aversion has led to a decline in outdoor learning (Cramp 2008). School ski trips have their own complications in respect to pupils having life changing injuries (Vass 2013). In one instance there was the death of a pupil when a fourteen-year-old boy fell off a ski lift and strangled himself in 2011 (Brookes and Holmes 2014). The safety of the pupil in respect to potential injury or death should be taken into consideration when organising school trips. Risk has often been stated as the primary reason for schools being discouraged in organising school trips where the fear of litigation is disproportional to the real risks involved (House of Commons Education and Skills Committee 2005). Risk management strategies are discussed further in section 2.8 and each risk factor is presented separately in Chapter three.

These various barriers can discourage teachers from organising school trips (HSE 2011) especially as teachers are under added pressure to manage risks as well as taking additional time and skill to organise school trips (Hunter-Jones and Hunter-Jones 2007). Nevertheless, it is crucial to weigh up the multifaceted benefits that school trips bring to pupils (section 2.4 and 2.5).

<sup>&</sup>lt;sup>5</sup> Parents has been used but this includes legal guardians within this term.

To curtail some of these challenges that teachers encounter, there are now various publications that offer advice and support to teachers organising school trips and specialised information concerning ski trips (HSE 2011; Hunter-Jones and Hunter-Jones 2007; NUT 2019; RoSPA 2019). These publications aim to tackle some of the health and safety concerns and give information on the preparation of a ski trip. Educational Visits Co-ordinators (EVC) working within schools provide guidance on the best practice for the organisation of a school trip (House of Commons Education and Skills Committee 2005), although there is no legal requirement to have an EVC (NASUWT 2019). Currently it is unknown what information teachers are accessing to facilitate them in the preparation of a school ski trip.

# 2.8 Risk management

Risk management has become a widely discussed topic in outdoor education (Hogan 2002). Within society we are inherently conscious of risk and aim to prevent the worst from happening (Austen 2009) to avoid litigation. The driving factor appears to have shifted towards the protection of the organisation rather than the individual. Thus, health and safety risks can be an issue when organising school trips which has been exacerbated by tragic disasters, legal sanctions and damage to careers (Coad, Brittle and Towner 2010; Davidson 2004; Gill 2010; Hogan 2002; HSE 2011; Hunter-Jones and Hunter-Jones 2007). What is ethically appropriate should be top of the agenda which is to minimise injury to the individuals involved (Hogan 2002). To add to this complexity, the law of other countries may differ from the UK and injuries or deaths occurring abroad are subject to the law of the land where the incident occurred (NUT 2019). Certain countries have very strict laws regarding conduct which pupils should be made aware of to prevent them from innocently breaking these laws when skiing without adult supervision (RoSPA 2012).

The unique environments in skiing requires teachers to balance safety and risk to ensure a safe and enjoyable experience for all young people (Boyes and O'Hare 2003). Young people should be given the opportunity to engage in an activity with a tolerable amount of risk if strategies are in place for a contingent event (Jenkins 2006). To reduce risks, decisions are made which come from prior experiences, from training providers, from reading educational sources and policies (Boyes and O'Hare 2003). Within all outdoor adventure activities there are inherent risks, which cannot be eliminated without stopping the activity although, we cannot be content with serious accidents being an inevitable part of the activity (Davidson 2004).

Organising school trips requires meticulous planning to safeguard and promote the welfare of young people (NUT 2019). The international dimension of a ski trip as well as young people being involved requires a higher duty of care from teachers (Hunter-Jones and Hunter-Jones 2007). Teachers ought to understand the risks involved, be able to implement risk assessments and introduce methods to control risks under the Health and Safety at Work Act 1974 (DfEE 1998). Although, teachers are not expected to organise trips without guidance and support from the experience of others (HSE 2011; NUT 2019). Guidance documents from the Department of Education and Employment (DfEE) and The Royal Society for the Prevention of Accidents (RoSPA) cover various aspects of arranging trips from how to plan the visit, supervision, preparing pupils, communicating with parents, planning transport, visits abroad (being aware of differences in legislation from the UK, ATOL protected when travelling by air transport, passports/visa etc), insurance and emergency procedures (DfEE 1998; RoSPA 2012). To gather the necessary advice on planning school trips teachers should familiarise themselves with these guidance documents. Schools can have an educational visit coordinator (EVC), whose role is to support the trip organiser and to liaise with the local authority's outdoor educational adviser although there is no legal requirement for this (NUT 2019). The Outdoor Educational Advisers Panel (OEAP) provides help, advice and support when organising activities in the outdoors (OEAP 2020). In the context of the law, trip organisers should provide reasonable steps to ensure the safety of young people (Gill 2010; RoSPA 2012). Parents are liaised with and reassured about pre-travel concerns especially in the context of terrorist attacks, natural disasters, injuries on the piste and road accidents

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(Hunter-Jones and Hunter-Jones 2007). Parental consent forms should be signed early in the planning stage allowing parents to understand all potential risk, set out clearly defined rules of pupil conduct during the trip and give consent if pupils can ski without adult supervision (Dickson and Terwiel 2013; NUT 2019).

Focusing solely on safety can deny young people the opportunity to experience the challenges that life presents (Gill 2010). This could create a generation that are risk naïve due to them being excessively protected during their education (Gill 2010). Educating and exposing young people to risks, especially in outdoor adventurous activities, will help to prepare them for adult life and to take a degree of personal responsibility (Gill 2010; RoSPA 2012). Empowering young people to understand the risks involved and take responsibility for their actions would facilitate young people to make informed choices throughout their life (HSE 2011). Expectations of behaviour on and off the piste should be managed from the start to ensure this aspect of risk is minimised.

Tourism organisations have a duty of care in the trip planning process and companies awarded with the LOtC quality badge show they promote good practice and safety in school travel (Hunter-Jones and Hunter-Jones 2007; NUT 2019). The School Travel Forum (STF) is the awarding body for the LOtC quality badge and schools planning trips are advised to use these companies (NUT 2019). Snowsports England (2020) offer two training opportunities for teachers to become either a Snowsports Course Organiser (SCO) or an Alpine Ski Course Leader (ASCL). The former takes six hours to complete and is designed to give teachers the skills necessary to organise snow sports for groups of young people within recognised resorts both in the UK and abroad (Snowsport England 2020). The latter course is designed to allow the supervision and leadership of skiers on the piste which involves six days of training although teachers need to be competent skiers in most terrain and conditions to complete this course (Snowsport England 2011; Snowsport England 2020). The SCO course requires ski leaders to attend once, while the ASCL requires a refresher to be completed every three years at an alpine resort (Snowsport England 2020) which will have an impact on affordability and time
available to complete the more advanced course. The SCO and ASCL courses are specifically aimed at teachers to be able to organise effectively or lead a group of school pupils to manage risks associated with ski trips.

Skiing is an adventure activity that carries an inherent risk of injury (Blitzer et al. 1984; Tronc 2006). However, if injuries can be reduced in number or severity through evidence-based risk mitigation strategies (Chapter three), then it would be appropriate to implement these into practice. It is essential to establish what the current practices are for organising school ski trips.

# 2.9 Cost of injuries

Taking part in PA is paramount for a young person's development, not only does this have a positive impact on lifelong health but the potential of gaining sporting expertise (Abernethy and MacAuley 2003). Benefits of PA are numerous, ranging from reducing risk of chronic diseases, such as cardiovascular disease and diabetes mellitus, through to improving mental health and wellbeing (Blair 2009; Carter and Micheli 2011). Despite these benefits, all PA has an element of injury risk (Abernethy and MacAuley 2003; Bahr and Holme 2003; Posch et al. 2020). Nevertheless, the positive benefits on health and social development far outweigh these risks (Verhagen, van Stralen and van Mechelen 2010). Enabling young people to remain injury free is essential to achieve this goal (Parkkari, Kujala and Kannus 2001; Verhagen 2012).

Sporting injuries have financial costs to the individual and to the healthcare system (Abernethy and Bleakley 2007; Harlow 1996), with major sports injuries being a reason for school absence which causes physical and social disruption to the individual (Abernethy and MacAuley 2003; Carter and Micheli 2011). With over four hundred million skiers worldwide and an estimated six million ski injuries, this poses a significant public health problem (Radovanovic et al. 2019; Vanat 2019). Severe injuries require specialised rehabilitation which results in

cost implications due to the multidisciplinary input involved to facilitate recovery (Abernethy and MacAuley 2003; Parkkari, Kujala and Kannus 2001; Silvers and Mandelbaum 2011). School absences due to injury may incur economic costs to the parents, managing childcare in addition to the young person being unable to enjoy other activities following the injury (Abernethy and MacAuley 2003). In young people (aged 11-18 years), 59% of school sport injuries led to time off school with 32% of parents requiring leave from work (Abernethy and MacAuley 2003), although the numbers of young people being injured whilst on school ski trips is unknown. Snow sport related injuries in young people in Canada costs over £1,100 per patient (Hackam, Kreller and Pearl 1999) which demonstrates an overall financial burden which directly and indirectly affects the family of an injured young person. Additionally, serious injuries which result in permanent disability (Bahr and Holme 2003) have further implications on health incurring financial and emotional costs. An example of this are knee injuries which could lead to osteoarthritic changes later in life (Shelbourne et al. 2012). Injury results in significant costs to the health care system as well as indirect costs to the individual (Hackam, Kreller and Pearl 1999; Parkkari, Kujala and Kannus 2001) which highlights the importance of remaining injury free.

Reducing risk of injuries in sport has become a worldwide health care priority due to the large number of injuries causing withdrawal from PA and additional cost implications from healthcare and school absence (Carter and Micheli 2011). Physical activity offers benefits to health (Blair 2009), however, all sports activities carry a risk of injury. These serious injuries can be debilitating to the young person causing a reduction in PA levels with a psychological impact and financial burden (Abernethy and Bleakley 2007; Harlow 1996; Parkkari, Kujala and Kannus 2001; Silvers and Mandelbaum 2011). To determine if schools engage in any activities that mitigate the negative impact of injury, a first step would be to establish current practices surrounding school ski trips.

## 2.10 Summary

Skiing has undergone many changes over its life span, evolving as primarily an active mode of transport to a fun sporting activity. Today alpine skiing is the most popular form of snow sport with young people having the largest involvement in this activity. Many people had their first experience skiing during a school trip with schools providing young people with these opportunities in the snow environment. Without school provisions many young people in the UK would not get the chance to experience these PA in the snow environment. Not only that, a school ski trip provides young people with the ability to explore the world and to learn outside the classroom in this different setting.

Despite the potential benefits of this experience, schools face many barriers in the organisation of ski trips which can come from within their institution or constraints from parents, increased health and safety measures, the fear of litigation along with the economic downturn has all contributed to the decline of school ski trips. Schools now may not be able to justify an annual trip due to the increased financial implications to the parents or to justify lessons missed because of absence from the school curriculum.

Appropriate risk management strategies help to reduce the potential for serious injuries, since injuries can have financial costs to the young person, families and to the National Health Service. It should be acknowledged that teachers need to be given the support and guidance to organise a school ski trip and young people need to be informed about the risks involved and to be able to make an informed decision. Consequently, the risks involved on school ski trips requires exploration within literature before examining the preparation practices prior to and during school ski trips abroad.

## Chapter 3: Risk factors in skiing

The previous chapter highlighted the benefits and barriers to UK school ski trips alongside the adherence to risk management. This chapter reviews the literature regarding the injury risk factors within skiing and management strategies to reduce risks to young people whilst on school trips. Thus, it will set the scene as to which factors increase risk of injury in the ski specific environment to enable these areas to be explored in the following explorative chapters (Chapter five and six).

Before reviewing the risk factors of injuries, it is imperative to know the injury profile of skiing which could potentially influence which risk reduction factors are key. Calculating ski injuries can be problematic due to an unquantifiable number of injured skiers not seeking medical attention (Langran and Selvaraj 2002; Warme et al. 1995). Those that do not need immediate treatment receive either no treatment, treat themselves or wait to receive treatment when they return home (Langran and Selvaraj 2002; McCall and Safran 2009; Schneider 2003; Warme et al. 1995). This will then lead to an underestimation of the incidence of some injuries (McCall and Safran 2009). Additionally, there appears to be no available reports on ski injury statistics specifically in the UK for young people taking part in school trips.

Data indicates that individuals more likely to report injuries are beginners, less experienced female skiers and younger skiers (Hagel et al. 1999). These injuries may be representative of this population, otherwise individuals who frequently report injuries will have a higher incidence of injuries compared to other groups who under report injuries (Hagel et al. 1999; Langran and Selvaraj 2002). Furthermore, the methods used to collect injury data and verify the injury can lack consistency between studies leading to discrepancies with injury data (McCall and Safran 2009).

## 3.1 Methods of collecting data

Methods used to collect injury data have been from questionnaires and surveillance techniques where information is collated from ski patrollers, first aiders, and physicians (Davidson and Laliotis 1996; Ekeland Rødven Heir 2019). Ski patrols will register virtually all accidents and the severity of the injury is conservatively graded to reduce the legal risk of misdiagnosis and mistreatment (Davidson and Laliotis 1996). Variations in injury statistics can be due to the differing inclusion criteria of injury (Warme et al. 1995) such as classifying by area involved, tissues involved or grade of injury. In addition, enhanced injury diagnosis may have contributed to an increase in the incidence of specific injuries instead of grouping injuries together (Schneider 2003).

Injuries are reported as injuries per thousand skier days (IPTSD) which is the commonly accepted method to report and evaluate ski injury incidence rates in literature (Davidson and Laliotis 1996; McCall and Safran 2009). Skier days for the season can be calculated from total ticket sales and/or lift statistics (Langran and Selvaraj 2002). The concept of IPTSD assumes that everyone who buys a ticket will be skiing all day (McCall and Safran 2009; Rønning, Gerner and Engebretsen 2000) and be exposed to the same risks (Laskowski 1999). This calculation may underestimate the population since season pass holders, instructors, patrollers and employees are not captured (McCall and Safran 2009; Warme et al. 1995). This population of unaccounted skiers are included in injury statistics where the IPTSD will be increased due to their skier days not being obtained, although injuries are documented (Warme et al. 1995).

The incidence of a specific injury can be reported as the mean days between injuries (MDBI) which allows the frequency of injuries to be defined. For IPTSD the lower the figure the less likely injuries are to occur whereas the higher the MDBI the less likely injury is to occur (Blitzer et al. 1984; McCall and Safran 2009).

- IPTSD = (Total number of injuries/total number of skier days) x 1000 (Langran and Selvaraj 2002)
- MDBI = Total number of skier days/total number of the specific injury (Blitzer et al. 1984; Langran and Selvaraj 2002).

Another method proposed is the distance correlated injury index (DCI) which is the number of injuries per 100,000km travelled (Rønning, Gerner and Engebretsen 2000). These authors proposed that distance travelled is related to skiing injuries and provides a valid method of monitoring injury incidence (Rønning, Gerner and Engebretsen 2000). Distance was estimated by number of lift trips and the length of the corresponding piste (Rønning, Gerner and Engebretsen 2000). Calculating injuries with this method can be problematic since the lifts often take skiers up to a point where there are multiple options of piste to use of varying lengths (Rønning, Gerner and Engebretsen 2000). Another method proposed by these authors is for skiers to estimate skiing hours per day. Conversely, this method would be time consuming and difficult in large populations to calculate an accurate time estimate (Rønning, Gerner and Engebretsen 2000).

# 3.2 Types of injury

In skiers, lower limb injuries are the most prevalent (Davidson and Laliotis 1996; Langran and Selvaraj 2002; Langran and Selvaraj 2004) and potentially the most serious to young people (Meyers et al. 2007). Knee sprains in the young population can be associated with osteochondral defects, disruption of the tibial or femoral physis resulting in growth irregularity and progression to osteoarthritis (Jones, Rocha and Virgolino 2014).

Across the alpine ski population in Scotland, a case control study identified lower limb injuries were accountable for over 53% of all injuries compared to 24% in the upper limb, MDBI 519 and 1142 respectively (Langran and Selvaraj 2002). More specifically, the region of the body most injured across the age

groups in alpine skiing is the knee (Sulheim et al. 2011; Summers et al. 2017) and has resulted in over 68% of the total injuries in the lower extremity (Stenroos and Handolin 2014). Within the knee, a literature review identified that the anterior cruciate ligament (ACL) is particularly vulnerable to injury whilst skiing (Johnson, Ettlinger and Shealy 2009). A meta-analysis of the incidence of knee ACL complete tears per 1,000 exposures in the general skiing population skiing is 0.49, which has a higher incidence compared to rugby 0.22, basketball 0.17 and football (soccer) 0.21 (Prodromos et al. 2007). An ACL injury is of significance since young people retire from active participation at a higher rate compared to those without ACL injuries (Maffulli et al. 2010) which comes back to the significance of remaining injury free (section 2.9).

Head injuries have been a cause for concern (Cadman, Robert and Macnab 1996; Macnab and Cadman 1996), with retrospective data from skiers hospitalised with head trauma indicating the highest incidence were in young skiers (1.91 per 100,000 ski visits in ages  $\leq$  17 years) compared to other age groups (0.62 per 100,000 ski visits in ages 25-44 years) (Diamond, Gale and Denkhaus 2001). From all ski injuries, young skiers sustain between 18-22% of injuries to the head and face (Langran and Selvaraj 2002; Macnab, Cadman and Greenlaw 1998a; Sulheim et al. 2006; US Consumer Product Safety Commission 1999). Injuries to the head are more dangerous than any other injury occurring on the piste (Ružić and Tudor 2011) as head trauma is the leading cause of death in skiing (Hennessey et al. 2002; Levy et al. 2002; Posch et al. 2020). In Colorado, a case control study identified that fatal head injuries in young skiers (aged 0-17 years) accounted for 67% of deaths, whilst in adults (aged  $\geq$  18 years) 42% of fatalities was from head trauma (Xiang, Stallones and Smith 2004).

## 3.3 Injury risk factors

Contributory factors to skiing injuries are multifactorial, including: impact with objects, skier collisions, or personal error leading to falls (Macnab and Cadman

1996; Macnab, Cadman and Greenlaw 1998a; Provance et al. 2018). Identifying the risk factors and mechanisms of injury helps to establish the cause of injury (Bahr and Holme 2003). Risk factors are of an intrinsic (internal) or extrinsic (external) nature (Bahr and Holme 2003; Fuller 2007; Habelt et al. 2011). Intrinsic factors relate to the individual whereas extrinsic factors are related to the environment or equipment (Bahr and Holme 2003; Caine, Maffulli and Caine 2008; Schiff, Caine and O'Halloran 2010). Intrinsically a wide variety of factors can influence the susceptibility to injury (Figure 3.1). For intrinsic modifiable risk factors there is a paucity of literature on risk reduction strategies (Hébert-Losier and Holmberg 2013). With both intrinsic and extrinsic factors there are potential modifiable and non-modifiable conditions influencing them (Habelt et al. 2011; Provance et al. 2018) (Figure 3.1). For example, nonmodifiable factors including age, sex, snow conditions and visibility are important to consider due to their interaction with other risks (Bahr and Holme 2003; Caine, Maffulli and Caine 2008; Kraus 1959). Extrinsic risk factors that have been modified relate to equipment changes, due to the evolution of skiing, alongside the piste being groomed to improve the skiing surface (Posch et al. 2020).

As well as individual risk factors, understanding the interactions of multiple risk factors may help to develop effective risk reduction strategies (Bahr and Holme 2003; Meeuwisse 1994). The interrelationships between risk factors which contribute to injury are diagrammatically represented in Figure 3.1. The presence of these factors does not always result in injury and an inciting event (injury mechanism) is normally the final link in the chain (Meeuwisse 1994; Verhagen, van Stralen and van Mechelen 2010). The precise description of the injury mechanism requires information about the events which leads to the injury situation (skier situation, skier behaviour) and a full description of body and joint biomechanics at the time of injury to aid in the understanding of the injury (Bahr and Krosshaug 2005). Nevertheless, this can be a difficult concept to implement and gather the necessary information about each injury.



**Figure 3.1** A multifactorial model of skiing injury aetiology adapted from Bahr and Holme (2003), Bahr and Krosshaug (2005), Meeuwisse (1994) and Raschner (2012)

Recognising the interplay of intrinsic and extrinsic factors along the path to injury enables us to identify how susceptible an individual is to injury before the inciting event occurs (Fuller 2007; Meeuwisse et al. 2007). Injury is a complex and dynamic process, through multiple participations an individual may be exposed to the same or different risk factors under similar conditions (Meeuwisse 1994; Meeuwisse et al. 2007). More recently a new cyclical model has been proposed (Figure 3.2) which allows adaptation to take place between exposures, changing the susceptibility to injury either positively or negatively (Meeuwisse et al. 2007). For example, whilst on a school trip the young person's skill level may adapt during the trip from novice to beginner, thus reducing their susceptibility to injury. However, if fatigue develops over the day or course of the trip and interacts with another intrinsic factor, such as neuromuscular control, the individual's altered intrinsic factor could then contribute to injury (Meeuwisse et al. 2007). Similarly, extrinsic factors such as the environment and snow surface may change increasing or reducing the potential for injury (Laskowski 1999). The theoretical model (Figure 3.2) by Meeuwisse et al. (2007) will be employed to evaluate the risks associated with injury whilst on a school ski trip. This will ultimately demonstrate why all the following risk factors in this chapter should be considered.

For success in controlling or reducing the level of risk, the targeted individuals need to engage with the recommended intervention and adopt the risk mitigation strategies (Finch 2006). These will be more likely to be adopted by pupils if schools are supportive of the intervention, it is easy to implement and it is relevant to that particular activity (Finch 2006). Risk reduction strategies will require an individualised approach to accommodate for different levels within a group (Meeuwisse et al. 2007). However, there is limited research investigating risk reduction strategies in the young, especially for school ski trips (Abernethy and Bleakley 2007; Coad, Brittle and Towner 2010).



Figure 3.2 A dynamic, multifactorial model of sports injury aetiology (Meeuwisse et al. 2007)

In summary, injury risk factors in skiing are multifactorial emerging from both intrinsic and extrinsic factors. These factors have modifiable conditions, which can be changed prior to the activity to reduce injury risk or changed through the course of the activity. These risks can come into effect at different stages during the activity (Figure 3.2). The next stage is to understand how risk can be mitigated through the adoption of risk reduction strategies.

## 3.4 Overview of research approaches to injury risk

School ski trips can have a positive impact on young people in many ways (section 2.5) however, a resultant injury can have serious outcomes (section 2.9). Accordingly, frameworks have been developed to translate the research concerning injuries in sport into risk reduction practice (Fuller and Drawer 2004, Fuller 2007; van Mechelen at al 1992; Finch 2006). These frameworks, such as the Translating Research into Injury Prevention Practice (TRIPP), aim to understand how the intervention will be translated into a real-world context and identify motivators or barriers to its uptake (Finch 2006). A risk management model has been developed encompassing elements of the TRIPP framework which additionally explores areas to reduce severity and/or incidence of injuries and incorporates individuals' perceptions of risk (Figure 3.3) (Fuller 2007; Fuller and Drawer 2004). The process starts with identifying risk factors and the relationships between them, epidemiological studies then measure the incidence and severity of injuries (Fuller 2007). The risk factors are evaluated to determine whether mitigation measures are required to reduce injury risks (Fuller 2007). The mitigation strategies are researched to understand if this reduces injury risk where finally, information is disseminated to the appropriate personal explaining how injury risks can be controlled or reduced (Fuller 2007).



**Figure 3.3** Injury risk management model (Fuller 2007; Fuller and Drawer 2004)

Risk factors for injuries are collected either by case control/review studies, cohort studies or intervention studies (Bahr and Holme 2003). Case control and case review studies have been predominantly used within this Chapter, since this is the common method to researching injury risk factors and injuries occurring within the snow sports literature. Case studies report on injuries occurring either prospectively or retrospectively (Hagel et al. 1999; Sulheim et al. 2006; Sulheim et al. 2011; Xiang, Stallones and Smith 2004) and help to draw conclusions and make recommendations (Johnson, Ettlinger and Shealy 2009). Retrospective reporting involves extracting information from the injured person on factors that contributed to the injury which can be compared to the uninjured population (Bahr and Holme 2003). Data for variables generally

gathered are: age, gender, level of ability, piste difficulty, time of injury, previous injury, snow conditions, weather conditions, equipment ownership, whether the bindings released and mechanism of injury (Hagel et al. 1999; Macnab and Cadman 1996; McBeth et al. 2009; Posch et al. 2020). However, the limitation of these studies is the impossibility to know the individual's intrinsic and extrinsic risk factors prior to the injury occurring.

Cohort studies measure risk before it happens prospectively in time (Bahr and Holme 2003). These studies provide direct estimates of incidence and relative risk (Bahr and Holme 2003) which can be extrapolated to the entire population. Conducting cohort studies are, however, more challenging, requiring longer study periods and/or a large number of participants for enough data to be collected, particularly when mean days between injuries are generally high (Finch 2006), such as head injuries in skiing.

An alternative method to study risk factors is an intervention study such as the randomised control trial (RCT) "A Little Respect: ThinkFirst! Ski Intervention" (Cusimano et al. 2013: 14). Studies using RCT interventions can provide the strongest evidence for modifiable risk factors, evaluating cause and effect relationships (Bahr and Holme 2003). Analytic studies, using a control group allow the researcher to determine the effectiveness of the intervention (Hagel et al. 1999). However, when multiple interventions are used to modify risk, results are more difficult to postulate to a single intervention, as more than one risk factor may have contributed in the modification of an injury risk.

Identifying the risks for injury within skiing is a complex process due to the dynamic and changeable nature of the activity. Research within skiing over the past 40 years has produced information on injury surveillance, reporting on injury patterns and the relationships to potential risk factors (Blitzer et al. 1984; Davidson and Laliotis 1996; Deibert et al. 1998; Goulet et al. 1999; Hagel et al. 1999; Langran and Selvaraj 2002; Langran and Selvaraj 2004; Macnab and Cadman 1996; Sulheim et al. 2011; Warme et al. 1995). The TRIPP framework advocates that, to advance knowledge of risk reduction, researchers need to implement interventions and report the efficacy of the intervention. To ensure

teachers are taking on the correct risk mitigation practices then the knowledge and skills need to be translated to this group (Verhagen 2012). To the researcher's knowledge there is a paucity of studies within skiing identifying whether these interventions are being implemented within practice to reduce injury risk, as a common limitation is failure to translate research findings into daily practice (Bolling et al. 2018).

## 3.5 Aetiology

In the early eighties the reduction of skiing injuries was anecdotally attributed to improved piste grooming techniques, improved ski instruction, improved management of rental equipment, area management safety and equipment improvements (Johnson et al. 1980). Today, injuries are still problematic especially alongside the fear of litigation, with the overall incidence of snow sports injuries showing no significant change over a 23-year period (3.5 IPTSD) (Vidal et al. 2018). Therefore, the intrinsic factors (age, level of ability, PA levels, physical preparation, fatigue, behaviour and knowledge) and extrinsic factors (bindings, helmets, ski lessons, nutrition and hydration, sun protection and staff to pupil ratio) were explored within this Chapter to identify areas of risk mitigation which are potentially integral to the organisation of school ski trips, informing the questions for Chapter 5 (section 5.2.5).

## 3.5.1 Bindings

Skiing has seen extensive developments and improvements in equipment over the years especially with the binding release system which anchors the feet to the skis (Deibert et al. 1998; Hunter 1999). Bindings are customised for the individual and adjusted to the height, body mass, age, length of the boot sole and skill level of the skier (Habelt et al. 2011; Johnson, Ettlinger and Shealy 2009; Ruedl and Burtscher 2019). The bindings should retain the boot during normal skiing manoeuvres and subsequently allow release during falls or where excessive force is transferred to the bindings (Bailey, Boon and Watson 2009; Johnson, Ettlinger and Shealy 2009) to reduce the magnitude of forces transmitted to the lower limbs (Kelsall and Finch 1999). In the 1970s the binding system changed to protect the ankle and tibia from fractures, the change in force loading now appeared to render the knee as the vulnerable joint (Crim 2003; Ettlinger, Johnson and Shealy 1995; Johnson, Ettlinger and Shealy 2009; Natri et al. 1999; Schneider 2003).

Ill-adjusted bindings that are 20% above or below recommended release torques advocated by the International Organisation for Standardisation, increase the risk of injury to the lower limb (Goulet et al. 1999). In a case control study of young skiers who presented with a spiral fracture of the tibia, 71% had a higher recommended release values for their bindings compared to the uninjured group (Deibert et al. 1998). Binding adjustment charts are made on biomechanical experiments conducted with adults (Goulet et al. 1999) and, as a result, this could lead to errors with release of bindings in young people. The amount of force necessary to release the bindings could be affected by young people weighing less and skiing with less velocity (Hagel 1999). If young people are not specifically weighed and body mass is estimated this will ultimately affect the binding mechanism. Skiers can self-test the release bindings by testing side to side release at the toe and heel upward release (Werner and Willis 2002). Despite this, young people aged 11-14 years were found incapable of self-releasing the ski bindings even when adjusted to their body mass, age and skill (Werner and Willis 2002). Thus, assessing self-release would not be an appropriate test in young people. Skiers should get their bindings tested by professionals to make sure they are optimally adjusted and fitted to international safety standards to ensure bindings are functioning correctly (Werner and Willis 2002). Unlike adults who could self-test their bindings daily, young people would realistically only have their bindings checked once when collecting their ski equipment from the hire outlets.

### 3.5.2 Helmets

#### 3.5.2.i Helmets and risk behaviour

Wearing helmets in skiing has been a subject of frequent debate due to the benefits of safety being offset by the increased levels of risk taking, because of the perceived feeling of safety whilst wearing a helmet (Scott et al. 2007). The risk compensation hypothesis suggests that skiers take more risks when wearing helmets which is characterised as the skiing speed and the degree of challenge that they now take compared to previous seasons when they did not wear a helmet (Ružić and Tudor 2011; Scott et al. 2007). However, despite these claims, other authors report that helmets are not associated with risky behaviour (Ruedl et al. 2010b; Scott et al. 2007). Within these types of studies, which use self report measures (Ruedl et al. 2010b; Ružić and Tudor 2011; Scott et al. 2010b; Ružić and Tudor 2011; Scott et al. 2007). Within these types of studies, which use self report measures (Ruedl et al. 2010b; Ružić and Tudor 2011; Scott et al. 2007), which use self report measures (Ruedl et al. 2010b; Ružić and Tudor 2011; Scott et al. 2007; Sulheim et al. 2006), there is a reliance on skiers being able to accurately self report key variables being explored. Additionally, there are slight differences with the age groups being studied and year of study period which may impact on variances within results.

Helmets have been shown to reduce head injury incidence by 29% to 56% (Hagel et al. 2005; Macnab et al. 2002; US Consumer Product Safety Commission 1999) and are especially effective in the young (Mueller et al. 2008). In a case control study of injuries sustained by a fall or collision, helmet use reduced the risk of severity of head injuries compared to not wearing a helmet (Mueller et al. 2008). Skiers can ski at high speeds which are well above the speeds for helmet testing protocols for recreational helmets (Dickson et al. 2016; Shealy, Ettlinger and Johnson 2005; US Consumer Product Safety Commission 1999). It would be necessary to inform helmet wearers of the extent that helmets provide protection and by skiing at high speeds would reduce the protective qualities of the helmet (Ružić and Tudor 2011) and further result in concussion or traumatic brain injury. In a laboratory investigation of winter headgear protection, the authors suggested the need for helmets to provide both low velocity (2-6 m.sec<sup>-1</sup>) and high velocity ( $\geq 8$  m.sec<sup>-1</sup>) impact

protection (Hoshizaki et al. 2012), since skiers will ski at different speeds whilst on the piste. For beginner skiers, helmets may offer the best protection for low speed collisions and minor incidents (School Travel Forum 2009) and be suitable for pupils attending ski trips.

### 3.5.2.ii Vision and hearing disturbance

Helmets worn in skiing, especially by young people, have had contradictory advice for their application, with authors proposing that helmets are not designed appropriately for smaller heads and can restrict vision and hearing (Macnab and Cadman 1996; Macnab, Cadman and Greenlaw 1998a; Shorter et al. 1996). The resultant effect of inadequately fitting, or heavy helmets could lead to a reduction in seeing, hearing or balance, potentially contributing to skier error and thus leading to injury (Macnab and Cadman 1996; Macnab, Cadman and Greenlaw 1998a).

Wearing helmets attenuates the sounds of danger at frequencies between 2-8 kHz which are characteristic of the sounds caused by the skier passing closely by, or the braking of a skier close behind (Tudor et al. 2010). Future research would need to establish whether skiers become accustomed to and adapt to locate the sounds whilst wearing a helmet (Ružić and Tudor 2011). Since the sounds can be distorted and misinterpreted when wearing a helmet (Tudor et al. 2010) which reduces awareness of oncoming skiers. Within Tudor et al's. (2010) study the participants took part in a randomised repeated measures design and were unaccustomed to wearing helmets and therefore the results could translate to novice skiers on school ski trips.

Skiers give way from below and it is the uphill skier's responsibility to move around the downhill skier (International Ski Federation 2016). Nevertheless, victims of ski collisions are often injured more than those who cause the accidents due to the victim being unable to react quickly enough to the incident (Burtscher and Philadelphy 1996). Being able to hear what is coming above so that the skier has time to react to oncoming skiers would be an important factor in helmet design.

In terms of the effects of helmets on the field of vision, a RCT repeated measures investigation established that wearing helmets had no effect on mean reaction time to peripheral stimuli when compared to wearing a ski hat (Ruedl et al. 2011). The recommendation is for the helmet to fit closely around the head (Shorter et al. 1996), being constructed so that the margin of the helmet is out of the field of vision (Ruedl et al. 2011) and not be too heavy as this could cause neck trauma (section 3.5.2.iii) (Deibert et al. 1998; Hunter 1999; Laskowski 1999). However, ski goggles show an increase mean reaction time to peripheral stimuli when worn with either a ski hat or helmet (Ruedl et al. 2011), rather than the helmet causing the visual restraints it may be the ski goggles alone increasing reaction time.

## 3.5.2.iii Neck Trauma

In young skiers, aged 13 years and under, there has been "some concern that helmet wearing is associated with an increased risk" of neck injuries (Ackery et al. 2007: 347) since the relative weight of the helmet added to the head will increase neck loading in this age group (Macnab et al. 2002). Similarly, the bending and twisting forces applied to the neck from the helmet during a routine fall could increase the severity of trauma to the neck (Hagel et al. 2005). Despite these factors, in two case control studies, young skiers (aged  $\leq$  13 years) wearing helmets had a decreased risk of head injuries and were not associated with an increase in incidence or severity of neck injuries (Macnab et al. 2002; Mueller et al. 2008). A meta-analysis of ski helmet users presented no significant association between helmet use and increased risk of neck injury in both young skiers and across the age groups (Russell, Christie and Hagel 2010).

#### 3.5.2.iv Helmet use

Helmet use among injured snow users has increased more than three-fold from 2002 (24%) to 2011 (77%) (Sulheim et al. 2017). The increase in wearing helmets during skiing in recent years is postulated from a combination of factors: the campaign for helmet use, the "helmet loaner" programme and from a widespread rise in public awareness of helmet use (Levy, Hawkes and Rossie 2007). High profile deaths such as actor Natasha Richardson and the major head injury sustained to Formula One driver, Michael Schumacher whilst skiing in 2013, correspondingly increased the awareness of helmet use whilst skiing (Haider et al. 2012; Mirror 2019).

Encouraging young people to wear helmets can be an issue as they are not compulsory in many resorts, are generally not included in the rental price when hiring equipment as a package and are thus seen as an additional expense in an already expensive climate (Hennessey et al. 2002; Levy, Hawkes and Rossie 2007). The issue of ski helmet costs was addressed in Colorado where helmets loaned for free in rental shops, were successful in increasing helmet usage (Levy, Hawkes and Rossie 2007). Thus, through decreasing such barriers to wearing helmets by including them in the ski rental package, offering discounts or allowing skiers to loan helmets for free, increases the use of helmets (Hennessey et al. 2002; Levy, Hawkes and Rossie 2007).

In brief, helmets have been the centre of frequent debate within the ski industry. Skiers may not perceive helmet use as a necessity (Hennessey et al. 2002) however, it is accepted that helmets have decreased the risk of head injuries in skiing when compared to non-helmet use (Haider et al. 2012; Scanlan et al. 2001) and should therefore be recommended (Skokan, Junkins and Kadish 2003; Sulheim et al. 2017). Teachers and instructors should wear helmets as role models to encourage young people to adopt these safety measures. In some resorts, mandatory laws have been introduced which require skiers younger than sixteen years to wear helmets on the piste and fines can be imposed on the skier if helmets are not worn (Burtscher, Ruedl and Nachbauer 2013; Alsop 2013). Not wearing a helmet could invalidate holiday insurance with one British firm, 'Essential Travel' stipulating that it is mandatory for helmets to be worn whilst participating in snow sports (Smith 2012). Recommendations for skiers should be centred around wearing properly fitted helmets and to ski within their abilities (School Travel Forum 2009; Scott et al. 2007), although the type and choice of helmet may be based on affordability, comfort, ventilation and access to a helmet (Hoshizaki et al. 2012).

## 3.5.3 Age

Young people have the highest incidence of injuries than any other age group within skiing (Langran and Selvaraj 2002; Langran and Selvaraj 2004; Macnab and Cadman 1996; Meyers et al. 2007; Sulheim et al. 2011). Those in the teenage years (aged 13-17 years) have an incidence of a significant injury of 3.34 IPTSD and are identified to be more likely to be injured than adults (aged 18-64 years) with an incidence of 1.87 IPTSD (Blitzer et al. 1984; Khalilifar et al. 2012; Macnab and Cadman 1996). The main cause of injury identified in a descriptive case study across the age groups was from personal error in 60% of those injured, from either losing control, crossing ski tips or falling over for no apparent reason (Macnab and Cadman 1996). In a case review of young skiers (aged 3-18 years) falls were the most common mechanism of injury (54%), with collisions with other snow users (10.4%) and objects (10.4%) being the next common causes (Summers et al. 2017), although it is not known from that study how the other 29.2% of injuries occurred. Injuries to young people are more often likely to be reported which may then increase the incidence in this age group (Langran and Selvaraj 2002).

In the young population the most commonly injured areas are the knee and head region (Hagel et al. 1999) (section 3.2) which is why bindings should be adjusted to the correct setting (section 3.5.1) and helmets should be worn (section 3.5.2) as alluded to previously. Adults and young people have differences in physical and physiological profiles which may cause young

people to be more vulnerable to injuries (Adirim and Cheng 2003). These differences could be from young people not fitting into the protective equipment adequately, more susceptible to osteochondral defects and possible delays or decline in sensorimotor skills during adolescence (Adirim and Cheng 2003, Quatman-Yates et al. 2012). Musculoskeletal immaturity is another factor contributing to injuries in young skiers (Meyers et al. 2007), with the adolescent growth spurts being associated with an increased risk for injury (Caine, Maffulli and Caine 2008). For example, during peak height velocity, poorer neuromuscular control and musculoskeletal imbalances can predispose a young person to injuries (Meyers et al. 2007; Myer, Gregory et al. 2008). Therefore, it is imperative that these factors are considered in the preparation of the young skier (section 3.5.7). In the evaluation of skiers, making direct comparisons across studies can be problematic since each study sets different parameters to define the age categories.

### 3.5.4 Level of ability

Inexperience in skiing has been associated with an increased risk of injury (Hagel et al. 1999; Langran and Selvaraj 2002; Sulheim et al. 2011). To categorise level of experience, researchers often use broad terms such as "beginner", "intermediate" and "advanced" which are self-reported by skiers (Brooks, Evans and Rivara 2010; Hagel et al. 1999; Johnson, Pope and Ettlinger 1974; Langran and Selvaraj 2002; Scott et al. 2007; Sulheim, Ekeland and Bahr 2007; Werner and Willis 2002). More objective methods used to categorise level of experience is through total amount of time spent on the piste or total number of days skied (Blitzer et al. 1984; Langran and Selvaraj 2002), although these methods could be flawed due to some skiers taking longer to develop skiing technique compared to others and skiers with poor technique having skied for several years. An alternative method to categorise level of ability is to identify the techniques used to control speed, turning technique and the level of difficulty of the piste grade most frequently used (Goulet et al. 1999; Sulheim, Ekeland and Bahr 2007).

Regardless of the method used to determine skiing ability, beginners are classed as a vulnerable population especially as expertise in skiing tends to reduce injury rates (Goulet et al. 1999; Hagel et al. 1999). Expert skiers may be susceptible to more severe injuries due to the high levels of risk taking where they perform high speed manoeuvres (Goulet et al. 2010; Ruedl et al. 2010b) but this was not correlated with injury statistics within a case control study (Langran and Selvaraj 2004).

It is of note, that significantly more injuries were sustained by non-local residents than to residents of South Tyrol during the winter season 2002-2005 in a case review study of injured snow sport users (Girardi et al. 2010). The difference between groups being associated with local residents being able to practise winter sports at a much earlier age, ski throughout the season and maintain a good level of training (Girardi et al. 2010) as this is part of their culture. Conversely, non-local residents practise for shorter periods of time and skied regardless of piste and weather conditions (Girardi et al. 2010). These explanations suggest non-local skiers are pressured to ski irrespective of external factors due to the limited time they have available to get onto the piste. Consequently, ski lessons should be recommended to improve level of ability and to ski within a safe environment.

## 3.5.5 Ski lessons

Skiers, including young skiers, have been found to be at an increased risk of injury on the first day of skiing (Langran and Selvaraj 2004). It is recommended that those who are inexperienced or new to skiing should be enrolled in lessons to teach appropriate techniques (Goulet et al. 1999). Rather counter intuitively, first day participants who had taken ski instruction were three times more likely to be injured compared to those who had not taken instruction in a case control study (Langran and Selvaraj 2004). In theory, ski instruction should teach the necessary skill to be able to ski safely and efficiently. It is not known from the

aforementioned study if these injuries occurred outside of these lessons where participants were able to push the boundaries due to their newly acquired skills.

Several of the most significant head injuries reported in a case review study by Skokan, Junkins and Kadish (2003) occurred when young skiers (aged 4-17 years) were participating in a resort ski school. Young people skiing with a school organised programme were at a higher risk of sustaining an injury (5.4 IPTSD) compared to the general youth population (4.3 IPTSD) (Cadman 1996). Within this case review, Cadman (1996) did not distinguish the number of ski lessons the young person (aged  $\leq$  17 years) had taken or when they had taken them. From the 125 injuries reported, only one of these occurred during supervised skiing and therefore it is outside of these ski lessons that young people are more at risk (Cadman 1996). Consequently, following lessons, skiers have more confidence whereby they might ski faster or attempt a piste beyond their level of ability (Langran and Selvaraj 2004). Thus, keeping pupils in lessons rather than allowing them to have free ski time may reduce the risks to pupils as they would not be then persuaded by their peers to be involved with risky behaviours (Koehle, Lloyd-Smith and Taunton 2002). Skiing tuition could also be implemented prior to the trip as well as during the ski trip, although there could be financial and logistical barriers. The potential value and benefits of having prior lessons within the UK are currently unknown.

#### 3.5.6 Physical activity levels

Sports related injuries in young people are escalating due to the decline in physical fitness through leading sedentary lifestyles (Bloemers et al. 2012; Carter and Micheli 2011). Physical fitness can be impacted by regular PA (Perkins et al. 2004) which needs to be at an adequate intensity. Physical activity is categorised as being either sedentary, light, moderate, vigorous or high intensity which can be measured using objective (metabolic equivalent (MET), heart rate (HR)) and/or subjective measures (rating of perceived exertion (RPE) scale) (Norton, Norton and Sadgrove 2010). Government

recommendations for health are for young people to be involved in moderate or vigorous physical activity (MVPA) for at least 60 minutes per day (Department of Health 2011). Increasing PA levels are a high priority (Finch, Wong Shee and Clapperton 2014) as insufficient readiness for sports participation due to poor conditioning seems to play a primary role to injury (Myer et al. 2011) (section 3.5.7).

A systematic review and pooled analysis of PA in young people has shown consistent findings of a decline in PA levels in pupils transitioning from primary to secondary education (Dunsmith et al. 2011). In a longitudinal cohort study of young people in the United States meeting at least 60 minutes of MVPA per day measured with accelerometery, Nader et al. (2008) found on weekdays at the age of nine years 96% met guidelines while by 15 years of age only 31% met guidelines. Weekend data showed a similar trend of 98% of nine year olds meeting guidelines of MVPA and by 15 years of age only 17% met MVPA guidelines (Nader et al. 2008). Schools self reporting the number of pupils completing 180 minutes or more of high-quality PE<sup>6</sup> lessons or extracurricular school sport increased steadily from year one to year six (Figure 3.4) (Quick, Simon and Thornton 2010). Conversely, when pupils move from primary to secondary school there is a steady decrease from year seven to eleven in the number of pupils completing this amount of activity (Figure 3.4) (Quick, Simon and Thornton 2010) which could be contributed to less time spent in the curriculum or pupils actively participating in less extracurricular activity. Social, cultural and physical environmental factors are potential contributing factors influencing a decrease in PA habits in pupils transitioning from primary to secondary education (Harrison et al. 2016).

Regular participation in PA does not ensure that the young person is adequately trained to reduce the risk of injury (Myer et al. 2011) in other activities such as skiing. Maintaining PA levels is important for young people in terms of health but is a necessity due to the energy demands skiing requires which involves

<sup>&</sup>lt;sup>6</sup> High-quality is defined as "producing young people with the skills, understanding, desire and commitment to continue to improve and achieve in a range of PE, sport and health-enhancing physical activities, in line with their abilities" (DfES 2003).

"fast, erratic and variable, short-duration, high-intensity efforts" (Turnbull, Kilding and Keogh 2009: 147). It is unknown whether young people are engaging in enough PA to be able to endure the energy demands needed for the duration of a ski trip.



**Figure 3.4** Percentage of pupils who participated in at least 180 minutes of high-quality PE and out of hour's school sport in a typical week (redrawn from Quick, Simon and Thornton 2010).

# 3.5.7 Physical preparation

An essential countermeasure to reduce injury risk is to prepare the young person physically before departing on a ski trip (Meeuwisse et al. 2007). Physical abilities in skiing require good coordination, flexibility, proprioception, strength, endurance and good anticipation which are influenced by participating in ski specific training to condition the individual for the demands of the activity (Kelsall and Finch 1999; Malliou et al. 2004). Specially qualified teachers or coaches should be used to give guided instruction to aid in the development of correct movement patterns and conditioning for that particular activity (Strong

et al. 2005). Informed opinion suggests that pre-season conditioning would be beneficial to ensure the young person is adequately physically prepared for the demands of skiing (Kelsall and Finch 1999) and to cope with the demands skiing places on the musculoskeletal system (Pasławska, Wojtyczek and Raschner 2012). Specifically, eccentric strength training for recreational skiers has been recommended since eccentric torque differed significantly in the thigh muscles following a four-hour skiing session (one hour and twenty-four hours post skiing) (Koller et al. 2015). Additionally, balance can be compromised due to reduced vision (poorly fitted helmets, ski googles, fog, snowfall) and from wearing rigid boots which restricts ankle mobility (Tchórzewski, Bujas and Jankowicz-Szymańska 2013; Wojtyczek, Pasławska and Raschner 2014). Although, without wearing ski boots, national skiers have demonstrated poorer balance compared to regional level skiers (Noé and Paillard 2005), suggesting skilled skiers balance strategy is different on the piste and raises the question of whether hip strategy sensorimotor training should be incorporated when there is limited ankle mobility (Malliou et al. 2004; Tchórzewski, Bujas and Jankowicz-Szymańska 2013).

To improve skiing performance and thereby decrease risk of injury, young skiers should pay increased attention to physical fitness and increasing skill level (Pasławska, Wojtyczek and Raschner 2012). If fitness tests or programmes are carried out, then these should be specific to skiing. An Austrian test battery, which included nine physical tests considered sport specific to skiing, had been adopted to test high performance ski racers (Raschner et al. 2012). One of the nine tests (speedy jumps) was used with Polish children (aged 13-16 years) to identify the agility of non-skiers and recreational skiers in an experimental design (Pasławska, Wojtyczek and Raschner 2012). The recreational skier's pre-seasonal fitness was shown to be unsatisfactory in the speedy jump test which the authors suggested may predispose these skiers to an injury (Pasławska, Wojtyczek and Raschner 2012). It would be useful for future research to determine whether an unsatisfactory level scored correlates to injury, especially for recreational skiers. Whilst these test batteries identify level of ski fitness, they do not give information on how to improve the level of fitness. However, a "Get fit to Ski"

(GFTS) programme was developed by the Australian Physiotherapy Association as a pre-season conditioning programme which aimed to improve a skier's endurance, strength, skiing technique, reduce muscle soreness and risk of injury (Gabbe and Finch 1999). A self-reported questionnaire to identify the benefits of the programme in 166 participants from a group of either repeat or new participants to the GFTS was studied (Gabbe and Finch 1999). The authors suggested skiers in the two groups perceived this programme improved fitness in 88-92% of respondents and improved recovery in 48-72% of respondents. However, only 41% of respondents expected or experienced fewer injuries from the "Get fit to Ski" programme due to the participants not perceiving it as an injury prevention programme (Gabbe and Finch 1999). Participants in this study had on average 13 years ski experience, were aged from 19-61 years and were motivated to participate in the programme. It would be beneficial to understand how this programme translates into the younger population and to objectively test rather than to have perceptions of the fitness test benefits. Other such programmes are readily available on the internet which state perceived benefits to reducing injury risk. However, programmes such as these are not evidenced based and a more recent systematic review identified that there are no recommendations for the prevention of injuries related to physical fitness training in recreational alpine skiers (Hébert-Losier and Holmberg 2013).

## 3.5.8 Fatigue

Families going on a ski holiday from the UK are typically on the piste from a few hours to an entire day, over consecutive days (Richards 1996) which is also stereotypical of a school ski trip. Whilst skiing for long periods, fatigue will undoubtedly result, affecting performance (Ferguson 2009) thereby increasing risk of injury (American Orthopaedic Society for Sports Medicine 2019). Fatigue is a complex phenomenon which ultimately results in a decline of performance from peripheral and/or central factors (Knicker et al. 2011). Fatigue develops during both high and low intensity exercise (Millet and Lepers 2004) with both central and peripheral fatigue contributing to reductions in motor control during skiing (Ferguson 2009). Furthermore, fatigue can manifest from acute bouts of skiing or from several days of skiing (Ferguson 2009). Objective data to support this suggests fatigue and stress occur during shorter runs due to skiing being an activity with a high degree of eccentric stress (Koller et al. 2015; Seifert, Kröll and Müller 2009). During three hours of self-paced recreational skiing activity, acute fatigue was inferred using HR and lactate for markers of physiological strain whilst for chronic fatigue, isometric contraction time, creatine kinase and cortisol markers were used (Seifert, Kröll and Müller 2009). During the threehour ski run HR was approximately 80% of maximal HR and blood creatine kinase levels increased 42% from baseline, isometric muscle endurance decreased significantly by 12% pre to post skiing (Seifert, Kröll and Müller 2009). It is likely, that in such circumstances the risk of injury is increased due to increased fatigue. Subjectively skiers felt less fatigued with shorter ski runs and being able to recover whilst on the chair lift (Seifert, Kröll and Müller 2009). Although perceived fatigue may not be a reliable indicator, since over 70% of injured cases felt no fatigue or only a trace of fatigue when the injury occurred (71% local fatigue and 72% overall fatigue) within a case control study (Ruedl et al. 2010a). Physiological responses to skiing intensity can be changed by environmental conditions and differences in skiing fitness and style (Seifert, Kröll and Müller 2009). To identify if any consideration of fatigue is given by teachers or if fatigue is mitigated in any way the practices that currently occur during school trips will need to be known.

A case review of injuries occurring over a ten-year period in alpine skiers presented time of day as an important factor for injury occurrence, with 67% of traumatic injuries occurring in the afternoon (McBeth et al. 2009). Specifically, two case reviews identified that over 62% of young skiers (aged  $\leq$  18 years) injured themselves in the afternoon (Hagel et al. 1999; Shorter et al. 1996). Contributory factors for injury in this timeframe transpired from cumulative fatigue, poor visibility or lighting levels, changing snow conditions or a predominance of skiers skiing in the afternoon (Hagel et al. 1999; McBeth et al. 2009). With long durations of time spent on the piste it would be crucial to incorporate adequate breaks to reduce the effects of fatigue, as a positive

moderate significant correlation between skiing time and local fatigue was established emphasising fatigue is related to skiing duration (Ruedl et al. 2010a). The case control study by Ruedl et al. (2010a) identified that local fatigue increases as duration on the piste increases but this is not linked to ACL injury risk. Further studies (Langran and Selvaraj 2004; Ruedl et al. 2010a) have reported injuries occur within the first three hours of skiing. With 81% of ACL injuries in females occurring within this short time frame and 45% of the total injuries within the first two days of the ski week, suggesting these injuries may not be fatigue induced (Ruedl et al. 2010a). Reasons for ACL injuries occurring at the beginning of the day could be due to colder temperatures affecting the capacity of the muscles around the knee to generate force explosively in order to protect the ACL (Csapo et al. 2017). Csapo et al. (2017) demonstrated this affect in a repeated measures design which participants undertook two conditions (warm 30° and cold -5°) and following the cold exposure, rate of force development was significantly reduced.

Injuries analysed by ski time during the day of injury identified 31% of injuries occurred in the first two hours, 42% between two to four hours and 26% occurred over four hours spent on the piste (Langran and Selvaraj 2004). Within two case review studies (Hagel et al. 1999; Shorter et al. 1996), injuries were recorded as morning or afternoon whilst Langran and Selvaraj (2004) recorded injuries as the amount of time spent on the piste. Breaking down injuries into the amount of time spent on the piste gives the understanding of how long people are skiing until an injury occurs. Within these studies it is unknown what time the skier started on the piste making comparisons difficult and more importantly, understanding if it is the time of day or the time spent on the piste which is a contributory factor to injury. In relation to time of the day, circadian rhythm and sleep deprivation has been found to impact on athletic performance (Thun et al. 2015) and therefore should be considered with respect to skiing time of day.

### 3.5.9 Nutrition and Hydration

Adequate nutrition during the ski trip is essential to fuel the body for the demands of the activity (Roberts 2013; Von Duvillard et al. 2004). Reductions in glycogen stores have been displayed following long durations on the piste in both skilled and unskilled skiers in an experimental design (Tesch et al. 1978). Biopsy from the vastus lateralis muscle in the morning and afternoon following a day skiing showed values declined on average by 32 mmoles glucose units x kg<sup>-1</sup> in skilled skiers and 22 mmoles glucose units x kg<sup>-1</sup> in unskilled skiers. This can impact on reaction time, cognition, memory and decision making (Lemaire et al. 2010; Roberts 2013). Glycogen utilisation is increased due to the intermittent activity of skiing which requires periods of intense muscle activity, sitting in the cold and having ski instruction, which increase the metabolic activity (Seifert et al. 2005).

Fluid balance plays a role in exercise performance (Seifert et al. 2006) and when exercising in the cold it has been shown that inadequate fluid is consumed resulting in greater dehydration (Rintamaki et al. 1995; Seifert et al. 2006; Von Duvillard et al. 2004). The increased metabolic activity impacted by increased heat production due to external cooling can also affect the water equilibrium (Rintamaki et al. 1995). During recreational skiing, significant fluid changes have been reported which can be reduced from having a continuous supply of water such as wearing a back mounted hydration system (Rintamaki et al. 1995; Seifert et al. 2006). It would be appropriate to educate young people on the importance of energy and fluid supplementation during the ski trip (Seifert et al. 2005).

#### 3.5.10 Risk taking behaviour

To promote safe skiing the International Ski Federation (FIS) introduced a code of conduct in 1967 that applied to all snow users (Hildebrandt et al. 2011). The safe skier code, or now known as the Alpine Responsibility Code, comprises of

ten rules of conduct to "prevent injury" to the skier and other piste users (Cadman 1996; International Ski Federation 2016). These rules include information regarding skiing, stopping, climbing, signs and procedures if there is an accident. Prior to skiing the FIS expect all individuals to be familiar with these rules and failure to do so could result in criminal liability on the parties at fault, although beginners and young skiers often have insufficient knowledge of this code of conduct (Hildebrandt et al. 2011; International Ski Federation 2016). This lack of knowledge was more prevalent within an injured group of young skiers than the non-injured group within a case control study (Macnab, Cadman and Greenlaw 1998b). Within both the injured and non-injured groups 50% who had heard of the FIS rules could not list the main points demonstrating serious gaps in knowledge (Macnab, Cadman and Greenlaw 1998b). This suggests young people with inadequate knowledge of the FIS may be more at risk of injury compared to skiers with adequate knowledge. To counteract this paucity of knowledge, educational training videos have been used with young people (aged 11-12 years) which have increased knowledge of the FIS safety code and awareness of appropriate behaviour whilst on the piste (Cusimano et al. 2013). The use of videos in two RCT studies has been shown to be effective for knowledge transfer, with ski videos being researched to examine skier knowledge, attitudes, behaviours and risk reduction measures (Cusimano et al. 2013; Jørgensen et al. 1998). These studies provide evidence of video knowledge transfer in reducing risk of injury in skiers. Jørgensen et al. (1998) study was across the ages of 5-61 years and conducted within Denmark. It would be advantageous to conduct similar studies to Cusimano et al. (2013) and Jørgensen et al. (1998) within secondary schools attending school ski trips within England and Wales.

Young people are subjectively associated with risky skiing behaviours such as being impulsive, reckless, skiing rapidly, showing poor judgement and exhibiting reduced risk awareness skills (Adirim and Cheng 2003; Blitzer et al. 1984; Langran and Selvaraj 2004). This poor consideration of risk awareness compared to adults is suggested to be a contributing factor towards injuries (Langran and Selvaraj 2004; Lloyd 2001). Young people may be more likely to act in a risky behaviour if they underestimate the risk associated with that

behaviour (Lloyd 2001). Educating young people on appropriate behaviour and expected codes of conduct could reduce risk taking behaviours on the piste (Cusimano et al. 2013; Koehle, Lloyd-Smith and Taunton 2002). Non-compliance of pupils may directly lead to increased risk of injury (Verhagen, van Stralen and van Mechelen 2010) from behaviours such as not applying sunscreen (section 3.5.11), wearing a helmet (section 3.5.2) or choosing a skiing velocity to their level of ability (section 3.5.4). Consequently, it may be necessary for all young people stay with a ski instructor or under adult supervision to ensure safe practices are followed and they are being educated on risk reduction measures.

## 3.5.11 Sun protection

Ultraviolet (UV) radiation is the primary risk factor for skin cancer (Petersen et al. 2014) and by adopting sun safety practices this can significantly reduce the risk of UV exposure (American Cancer Society 2014). Important interventions to reduce this risk include sunscreen (protective factor of 30 or higher), wearing a hat and eye protection (American Cancer Society 2014). Skiing significantly increases UV exposure through reflection of the UV radiation by the snow, sweat increasing the photosensitivity of the skin, increased altitude and the amount of time spent outside (Jinna and Adams 2013), which are exacerbated by young people being under protected.

The Go Sun Smart (GSS) campaign was developed to increase awareness of safe sun practices to ski area employees (Andersen et al. 2012; Buller et al. 2005). Using a RCT design, the GSS programme resulted in a significant reduction (14%) in sun burn compared to the control intervention (8%) from the year 2001 to 2002 (Buller et al. 2005). The GSS programme was directed at parents and young people enrolled in snow sports schools in a RCT intervention which recommended three sun safe behaviours "wear sunscreen, sunglasses and a hat" (Walkosz et al. 2007: 3). This intervention increased the use of sun screen protection but did not increase the use of sunglasses or a hat (Walkosz

et al. 2007). In a case review of injured snow sports users (aged  $\geq$  18 years), 96% wore sunglasses or goggles, whilst sun screen protection was only used in 65% of snow sports users illustrating that this precautionary measure is far from universal (Hansom and Sutherland 2010). These results could be biased since the study population included 64% of local ski residents, whereas nonlocal residents may adopt different strategies. Over the years there has been an increase in sun protection messages resulting in an increased adoption of these practices (Walkosz et al. 2014). For non-local residents these messages must be disseminated prior to the trip to ensure necessary precautions are in place before departing.

## 3.5.12 Teacher knowledge and guidance

Coordinating school trips require managing the balance of safety and risk to provide a secure and rewarding experience (Boyes and O'Hare 2003). Teacher knowledge and experience in organising trips is considered essential to recognise the real risks that are involved (Hogan 2002). To understand how knowledge is created we first need to understand what is meant by the term knowledge. Knowledge implies the 'knower' has reached a level of awareness or familiarity where they have acquired or self-generated understanding of the area (Higgs and Titchen 1995; Rycroft-Malone et al. 2004). Knowledge is a continual evolving process in which teachers transform the content knowledge to the learner (Shulman 1987). The application of this knowledge to transform the subject material for instruction, evaluate and reflect on the process (Shulman 1987).

Knowledge can be obtained through propositional knowledge (public knowledge) or evolve through non-propositional knowledge, which is acquired from practice and experience (Eraut 2000; Higgs and Titchen 1995). Higgs and Titchen's (1995) interactive overlapping diagram clearly illustrate the types of knowledge and influences on knowledge generation (Figure 3.5). These three

classifications are personal knowledge, propositional knowledge and professional craft knowledge. Propositional knowledge has a higher regard due to this being subject to quality control as it is used in educational programmes and derived from research, whereas non-propositional knowledge or personal knowledge is a non-formal learning process, this is often the process through which we learn and is derived through practice (Eraut 2000; Higgs and Titchen 1995; Rycroft-Malone et al. 2004). A teacher's professional craft knowledge base is derived through initial teacher education and/or through continuing professional development (Verloop, Van Driel and Meijer 2001). Teachers decisions are often based from prior experiences which can be drawn from both propositional and non-propositional knowledge (Boyes and O'Hare 2003). Understanding where teachers acquire their knowledge to organise school ski trips would identify if propositional or non-propositional sources are used for knowledge transfer.





Teachers should be well trained to prepare school trips and these should be led by qualified staff (House of Commons Education and Skills Committee 2005). It is essential for teachers to have access to continuing professional development to support them in the process of organising school trips (House of Commons Education and Skills Committee 2005). Increasing staff knowledge to organise a safe ski trip can be learnt from specialised courses (section 2.8) such as the SCO award which is compulsory in some local authorities for teachers to complete (Snowsport England 2020). This course gives teachers the skills necessary to organise a snow sports course in the UK and abroad (Snowsport England 2020). However, the SCO does not qualify holders to supervise skiing or to give ski instruction (Snowsport England 2020). Whereas the ASCL is a recognised award which allows teachers to take sole charge of groups on the piste. The course deals with all aspects of leadership and allows teachers to lead pupils when they are not with a ski instructor (Snowsport England 2020). Those with this award can only supervise groups with whom they have a pre-existing relationship (Snowsport England 2020). Both the ASCL and SCO are not designed to allow teachers to teach or instruct pupils whilst on the piste. Additional information to support teachers with the knowledge to organise school trips can be acquired through educational material which is readily available throughout the internet (section 2.8) or from previous ski trip experiences. It would be valuable to identify where this educational information originates from to ensure it is evidence-based.

#### 3.5.13 Staff to pupil ratios

In any school off site visit, appropriate staff to pupil ratios are advised to provide adequate supervision throughout the duration of the trip (Kelsall and Finch 1999), although the Health and Safety Executive (HSE) have not laid down specific staff to pupil ratios for off-site activities (HSE n.d.; NUT 2019; RoSPA 2012). The National Union of Teachers (NUT) (2008) and RoSPA (2012) have suggested there should be one adult for a maximum of twenty pupils from school years seven to thirteen (aged 11-13 years) on local visits in normal circumstances. Conversely, with visits abroad there should be a minimum of one adult to ten pupils with adults of opposite sex for mixed groups (RoSPA 2012). For higher risk activities a ratio will be 1:5 or lower is preferred (RoSPA
2012). The numbers of staff can include parents and other volunteer helpers, although some authorities stipulate a minimum number of teachers in addition to a minimum number of adults (RoSPA 2012). During school trips teachers should retain the primary responsibility for supervising groups (RoSPA 2012). Therefore, it is suggested one teacher remains present with each group (RoSPA 2012). This would necessitate supervising staff have the ability to ski with or around the groups, which would ensure pupils are being observed to monitor progress and application of skill on the piste (Brookes and Holmes 2014).

## 3.5.14 Summary

In summary the literature review presented in this chapter has highlighted that preparation for a ski trip is crucial in the planning and execution stages, especially as there is a high incidence of injuries in the young skier. There is a plethora of extrinsic and intrinsic factors to consider which can impact upon the young person, specifically their preparation to reduce risk of injury. Teachers must ensure they have the appropriate knowledge that they can convey the correct messages to the young person as well as completing the necessary administrative documentation. Skiers have a responsibility to prepare themselves for the mountains (Hansom and Sutherland 2010) and for this to occur, sufficient information needs to be imparted to the young person for them to understand the risks and potential for injury without reducing their enjoyment or participation in skiing (Langran 2004). It would be appropriate to understand if teachers are: disseminating knowledge about the FIS safety code; ensuring pupils are wearing adequate clothing and sun protection; checking pupils understand how to use ski equipment; enabling pupils to develop the physical requirements for the activity; educating pupils by having ski lessons to teach proper techniques and safety on the piste, which will ensure young people are thoroughly prepared for the requirements of the activity.

Chapter 4: Methodology

### 4.1 Introduction

This chapter discusses the methodology used to underpin the justification of the methods chosen at each stage of the process within the thesis. It begins with a discussion of the philosophical assumptions which is necessary to make clear. These are fundamental aspects of research inquiry which shape the research practice. Both the quantitative and qualitative paradigms are discussed and how these paradigms can work together within a mixed method design and the debate around this. Subsequently, this chapter addresses how methodological triangulation was used alongside the sampling methods used for each paradigm. Researcher positionality is explored using a reflexive approach and the strategies used to ensure rigour within both paradigms are discussed. A broad overview of the methods chosen, the selection of participants, data collection and data analysis are considered within this chapter. A more detailed description of the methods used within the individual studies is presented within Chapters five, six and seven.

## 4.2 Paradigms

A paradigm or worldview is a term traditionally used to describe "a basic set of beliefs" (Guba 1990: 17) that guides the researcher and the research process (Joubish et al. 2011; Morgan 2007). Our worldview will affect our beliefs, values, the way we behave, think, and how we approach and interpret research (Miller 2007; Morgan 2007).

Essentially, there are two paradigms within research; quantitative (deductive, objectivist) and qualitative (inductive, interpretivist) (Antwi and Hamza 2015;

Sale, Lohfeld and Brazil 2002). In broad terms, the quantitative paradigm is distinguished by the measurement of numerical data using statistical forms of data analysis, compared with that of qualitative research which is based on linguistic data (Elliott and Timulak 2005; Yilmaz 2013). Within quantitative research this should be objective whereby the researcher is uninvolved with the object of study and a formal writing style is used (Johnson and Onwuegbuzie 2004). Quantitative research allows for greater numbers of people to participate in research allowing for generalisations and can test associations between variables (Van Griensven, Moore and Hall 2014; Yilmaz 2013). Therefore, the quantitative paradigm will complement the aims of Chapter five to examine the current practices surrounding the school ski trip across England and Wales allowing for commonality of experience to be viewed.

An alternative paradigm, gualitative, seeks to explore an in-depth understanding of social phenomena within the natural setting (Joubish et al. 2011). Within this paradigm, researchers recognise the need to explore and understand human knowledge and experience (Savin-Baden and Major 2013) by gathering the participant's views on the situation (Creswell 2003). Researchers recognise that their own background and values shapes their interpretation, and this is made explicit within the research (Creswell 2003; Onwuegbuzie 2002) through positionality (section 4.7 and 8.5). Using qualitative methods within Chapter six provided participants with the freedom to bring valuable insights from their experiences and the ability to elaborate on the topic area in descriptive terms (Yilmaz 2013). Qualitative researchers believe that there is not a single reality, and this will be different for each person's perspective which can change through time (Joubish et al. 2011; Sale, Lohfeld and Brazil 2002). This paradigm can be carried out from a range of philosophical perspectives and focuses on the way people interpret and make sense of their experiences (Malterud 2001; Savin-Baden and Major 2013). Within Chapter six a qualitative approach was adopted which explored the preparation practices of teachers which allowed them to elaborate and discuss valuable insights of their experience.

In short, the methods used for these two paradigms are different, the quantitative paradigm seeks to generalise while the qualitative seeks to understand (Scotland 2012). Thus, deciding on which paradigm to use will depend on the preferences of the researcher's worldview and what topics and ways in which they carry out their study (Morgan 2007). The quantitative methods enabled the researcher to measure the responses of multiple participants (Chapter five), thereby allowing the researcher to generalise findings. Although, this has the limitation of not capturing the participant's thoughts, feelings and experiences within their own words (Yilmaz 2013). To describe and understand the phenomena, qualitative methods were used within Chapter six, which allowed participants own words, through direct quotes to document their experiences (Yilmaz 2013).

#### 4.3 Philosophical assumptions

A researcher's philosophical and theoretical stance will guide their procedures for conducting research (Creswell 2007). As researchers, we bring our own beliefs and philosophical assumptions into our research which have been embedded through engagement of scholarly articles, books, discussions with peers and our advisors (Creswell 2013b). By making these assumptions explicit allows other researchers to understand the researcher's stance (Savin-Baden and Major 2013). Within qualitative research, researchers take a philosophical stance towards each philosophical assumption (Creswell 2013b). These assumptions are ontology, epistemology, axiology, rhetorical and methodology (Creswell 2007; Creswell 2013b). Each will be outlined in Table 4.2 to help the reader.

Ontology is the stance towards "the nature of reality" (Guba 1990: 18). Quantitative researchers adhere to a realist view of reality where hypotheses can be converted into a mathematical formula (Sale, Lohfeld and Brazil 2002) (Table 4.2). Whereas, the qualitative researcher adopts relativist ontology which conceives that reality is socially constructed (Sparkes and Smith 2014). Researchers, those individuals being researched, and readers of the research will each embrace different realities based on that person's construction of reality (Creswell 2013b; Sale, Lohfeld and Brazil 2002). The researcher's ontological view of reality contains elements from both paradigms and to present the multiple realities, the researcher has evidenced individual perspectives using quotes from the participants within the study (section 6.3).

Epistemology is the theory of knowledge and how knowledge is created and acquired (Carter and Little 2007; Morgan 2007; Scotland 2012). Quantitative researchers adopt an objectivist position, which assumes the research entity is independent to the researcher (Sparkes and Smith 2014). In contrast, a qualitative researcher can immerse themselves within the participant's reality (Creswell 2013b). Within this thesis the researcher's epistemological position was from a combined perspective due to the mixed methods approach chosen (more detail given in section 4.4). Chapter five enabled the researcher and respondents to be impartial to one another whilst Chapter six facilitated in a deeper connection which allowed the researcher and respondents to elaborate providing rich descriptions. Consequently, the choice of methodology used was influenced by the epistemological approaches used within each study.

The axiological assumptions are the values the researcher brings to the study (Creswell 2013b). The "researcher acknowledges that research is value-laden and that biases are present" (Creswell 2013b: 21), therefore the researcher has reported their own values through research reflexivity (Biddle and Schafft 2015) (section 8.5). Furthermore, axiology relates to epistemology, as it is these values that help to inform the epistemological position (Carter and Little 2007).

The language of the research (rhetorical) is often different within quantitative and qualitative research (Creswell 2007). Quantitative researchers use a formal impersonal voice (Johnstone 2004), in comparison to qualitative researchers who tend to embrace a personal style of writing (Creswell 2007). Across the studies within this thesis the researcher has chosen to use a formal language for consistency.

Table 4.2 Paradigm differences adapted to	from Creswell (2007)
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Assumption	Question	Quantitative	Qualitative
Ontological	What is the nature of reality?	Objective and belief in a single reality	Subjective and believe in multiple
		(Sparkes and Smith 2014)	realities (Sparkes and Smith 2014)
Epistemology	What is the relationship between	Independent to what is being	Interacts with the study
	the researcher and that being	researched (Johnstone 2004; Sparkes	phenomenon (Johnstone 2004)
	researched?	and Smith 2014; Yilmaz 2013).	
Axiological	What is the role of values?	A value free framework (Yilmaz	Researcher acknowledges their
		2013).	values and biases (Johnstone 2004)
Rhetorical	What is the language of research?	Formal, impersonal voice (Johnstone	Personal voice (Johnstone 2004)
		2004)	
Methodology	What is the process of the	Experimental and manipulative with	Dialectical (Guba and Lincoln 1994)
	research?	conditions controlled (Guba and	
		Lincoln 1994)	

### 4.4 Mixed methods: the third paradigm

A third research paradigm where qualitative and quantitative methods are integrated is recognised as being mixed methods (Johnson and Onwuegbuzie 2004; Venkatesh, Brown and Bala 2013). Within a mixed method design both the qualitative and quantitative components focus on the same research problem with the findings being integrated to answer the research question (Denscombe 2008; Palinkas et al. 2015). The integration of the quantitative and qualitative data is a fundamental part of mixed methods research and can occur during the data collection phase, analysis or the interpretative stage (Halcomb, Elizabeth and Hickman 2015; Kroll and Neri 2009; Östlund et al. 2011). The survey (Chapter five) and interview (Chapter six) were integrated during the analysis and interpretive stages within Chapter seven.

In this thesis, the researcher used a combination of research designs to balance the fixed characteristics of the quantitative approach (Chapter five) with the exploratory flexibility of the qualitative approach (Chapter six) (Kroll and Neri 2009). These different methods helped to inform and supplement each other which facilitated in a complete picture of the phenomena of interest (Feilzer 2010). Both paradigms have their place within research and by combining the two enabled the researcher to draw from the strengths of both within a research study (Johnson and Onwuegbuzie 2004; Onwuegbuzie, Anthony and Leech 2005) (Table 4.3).

There has been much debate for the superiority of the two social science paradigms (quantitative and qualitative research) and the use of mixed methods research (Östlund et al. 2011; Savin-Baden and Major 2013). The debate around these two paradigms was known as the 'paradigm wars' (Bryman 2006). The 'paradigm wars' have focused on the differences between the two paradigms and that they should not be mixed (Feilzer 2010; Johnson and Onwuegbuzie 2004) due to the differing epistemological and ontological positions (Griffiths and Norman 2013). Mixed methods research became a

controversial theme due to the alleged different paradigmatic assumptions (Bryman 2006). The combination of these two paradigms has however become widely practised and accepted (Biddle and Schafft 2015; Östlund et al. 2011; Sale, Lohfeld and Brazil 2002) due to the different perspectives each paradigm brings to the researcher (Östlund et al. 2011). Therefore, these two paradigms should be seen as complementary rather than conflicting to give a multidimensional perspective as no one paradigm can explain all the facts (Feilzer 2010; Malterud 2001; Muncey 2009). With this in mind, in this thesis the researcher used multiple approaches (Chapter five and six) to give a richer understanding of the preparation practices of school ski trips in England and Wales (Onwuegbuzie, Anthony and Leech 2005). Using more than one approach to answer a research question is known as triangulation (Heale and Forbes 2013).

**Table 4.3** Strengths and weaknesses of mixed methods research adaptedfrom (Johnson and Onwuegbuzie 2004; Östlund et al. 2011).

Strengths	<ul> <li>Contextualise quantitative data using qualitative data</li> <li>Quantitative data can add precision to qualitative</li> <li>Incorporates strengths from both paradigms</li> <li>Researchers can answer a broad range of research questions as they are not confined to a single paradigm</li> </ul>
	<ul> <li>Through convergence and corroboration of findings a stronger conclusion can be reached</li> <li>Insights and understandings may be missed when using a single method</li> <li>Quantitative methods add generalisability to the findings</li> </ul>
Weaknesses	<ul> <li>Researches should understand multiple methods</li> <li>There is not always transparency about if the findings are from the quantitative or qualitative study</li> <li>Time consuming</li> </ul>

#### 4.5 Methodological triangulation

Triangulation is a technical term which originates in the field of navigation whereby two known points are used to plot the location of a third point (Hammersley 2008). Triangulation combines two different perspectives to obtain a three-dimensional representation of the phenomena (Erzberger and Prein 1997). Historically, triangulation was used to eliminate weakness from one method alone and used to corroborate findings (Jack and Raturi 2006) to enhance the validity of the research (Bekhet and Zauszniewski 2012; Lincoln and Guba 1985). However, this is controversial and assumes one method will compensate for the other. More recently, triangulation has two main purposes, for confirmation and for completeness of findings (Casey and Murphy 2009). Confirmation is a process of bringing the findings from the two methods to confirm one another whilst completeness aims to gather multiple perspectives from the different methods (Casey and Murphy 2009). This aims to provide a complete and comprehensive rich data set that endeavours to fulfil a deeper understanding of the phenomenon (Jack and Raturi 2006; Morse 1991).

There are five types of triangulation used within research which are outlined in Table 4.4. The integration of quantitative and qualitative data which are merged to bring the datasets together within mixed methods research is known as methodological triangulation (Morse 1991; Palinkas et al. 2011). This type of triangulation is the primary focus within this thesis and will be discussed.

There are two types of methodological triangulation which are across method and within method (Bekhet and Zauszniewski 2012). Across method triangulation combines quantitative and qualitative data collection techniques (Bekhet and Zauszniewski 2012), whilst within method or multi-method triangulation involves data collection techniques from only one paradigm (Casey and Murphy 2009; Halcomb, Elizabeth and Hickman 2015). Therefore, within method designs do not have the same paradigmatic problems as across method since the paradigm utilised can be adopted for both. The juxtaposition of quantitative and qualitative methods often sees these findings being

discussed separately (Feilzer 2010). However, the integration of the findings of the two studies (Chapter five and six) provides an enriched understanding from a multidimensional perspective in Chapter seven.

	1	
Triangulation	Explanation	Example
Data triangulation	Involves using multiple	Interviewing teachers,
	data sources (Farmer et	parents and pupils around
	al. 2006).	the same phenomena
		(Guion 2002).
Investigator	The involvement of two or	Two researchers
triangulation	more researchers in the	comparing their findings
	analysis process (Farmer	from an interview to
	et al. 2006).	develop a deeper
		understanding (Guion
		2002).
Theoretical	Different perspectives to	Individuals from various
triangulation	Interpret a single set of	disciplines could bring
	data (Farmer et al. 2006).	different perspectives on
	Similar to investigator	the phenomenon (Gulon
	thangulation where there	2002).
	are multiple perspectives	
Environmental	Factors related to the	Using different locations or
triangulation	environment which may	times of day to check data
<u>j</u>	influence the findings	validitv.
	across different settings	
	(Guion 2002).	
Methodological	The use of multiple	Survey and semi
triangulation	methods of data collection	structured interview
	techniques (Farmer et al.	findings brought together.
	2006).	

 Table 4.4 Types of triangulation

Within methodological triangulation researchers use an iterative cycle (abduction) to analyse the data, which requires the researcher to move back and forth between the data sets (Feilzer 2010; Shannon-Baker 2016). The outcome of triangulation can be convergent, complementary or divergent (Östlund et al. 2011). Where the quantitative and qualitative findings lead to the same conclusion is referred to as a convergent outcome, as opposed to findings being contradictory in which it is called a divergent outcome (Heale and Forbes 2013; Östlund et al. 2011). Quantitative and qualitative findings can be used to supplement each other which are referred to as a complimentary outcome (Heale and Forbes 2013; Östlund et al. 2011). Complementary findings aid to strengthen the findings from both studies (Morse 1991). Within this thesis the researcher used methodological triangulation as it was envisaged that both paradigms could then give a more rounded understanding and answer the research aim of exploring the preparation practices of school ski trips in England and Wales. Findings from both Chapter five and six were standalone before being synthesised in Chapter seven to give a comprehensive depiction of the phenomena (Erzberger and Prein 1997; Morse 1991).

Casey and Murphy (2009) reviewed several studies incorporating triangulation in which the main rationales for its use was "overcoming bias, depth of understanding, confirmation, completeness and increasing validity" (Casey and Murphy 2009: 43). The elements to achieve the rationale should be made explicit and describe the process (Casey and Murphy 2009) due to the interpretive nature of triangulation (Farmer et al. 2006). However, Farmer and colleagues (2006) have reported that there is a dearth of literature explaining how the process of triangulation is applied (Farmer et al. 2006). A research framework to incorporate methodological triangulation into research was developed by Jack and Raturi (2006). Their paper discusses how to make informed choices on developing a strategy for methodological triangulation. Furthermore, Lukkarinen (2005) and Farmer et al (2006) have detailed the methods used in conducting methodological triangulation, allowing others to follow these procedures. More recently, Venkatesh et al. (2016) have produced guidelines which provide an in-depth overview for conducting mixed methods research. The popularity of mixed methods research has in turn necessitated

for articles to publish guidelines on these methods. Within Chapter seven the process of methodological triangulation is detailed using these aforementioned researchers' approaches. In summary, methodological triangulation was used to promote a comprehensive understanding of the phenomenon by the application of several strategies (Heale and Forbes 2013; Jack and Raturi 2006).

#### 4.6 Pragmatism

The dichotomy between objectivity and subjectivity is disrupted when employing a pragmatic approach to mixed methods (Shannon-Baker 2016). Researchers generally use pragmatism as the philosophical partner when using a mixed methods approach (Denscombe 2008; Johnson and Onwuegbuzie 2004). Pragmatism offers a middle ground philosophically and methodologically which supports the coexistence of the two paradigms (Johnson and Onwuegbuzie 2004). Thus, pragmatism is not committed to any one philosophy and therefore gives the researcher choice of the methods and techniques which satisfy their research question (Creswell 2003; Feilzer 2010).

The researcher was drawn to pragmatism as this seemed to focus on the consequence of the research, allowing the researcher to better address the research aim of exploring the preparation practices of school ski trips in England and Wales, by selecting the most appropriate methodologies (Creswell 2013a; Johnson and Onwuegbuzie 2004). In this way the researcher used abductive reasoning to move back and forth between deduction (quantitative) and induction (qualitative) which allowed further exploration of the knowledge that had been produced (Morgan 2007). As such, the researcher had to be "flexible and open to the emergence of unexpected data" during this process (Feilzer 2010: 14). Additionally, the advocacy of transferability through the knowledge that is produced was a fundamental draw to this approach (Morgan 2007). Thus, pragmatism acknowledges the value of both quantitative and qualitative methods which facilitated towards the researcher having a better understanding of their research question using these approaches.

#### 4.7 Positionality statement

The positionality of the researcher is an important component to share with the audience to provide a transparent perspective due to the subjectivity of qualitative research (Finlay and Gough 2003). Therefore, the researcher's views, values and beliefs in relation to the research topic is acknowledged to highlight the impact this may have had upon the research process (Bourke 2014, Popa, Guillermin and Dedeurwaerdere 2015) (section 8.5). The positionality was defined through reflexivity which involved sharing the researcher's views and positions, as the assumptions a researcher holds may influence the design, interpretation and understanding of the findings (Greenbank 2003; Pillow 2003). However, the researcher's positionality is never fixed and can change depending on the situation or context which requires an iterative process to occur (Popa, Guillermin and Dedeurwaerdere 2015). To accomplish positionality, the researcher has located them self in relation to the subject area, the participants and in relation to the research context (Savin-Baden and Major 2013). This has been explored within section 8.5

## 4.8 Description of design

The integration of both qualitative and quantitative methods at predetermined stages of the research process categorises this study as having a mixed methods design (Kroll and Neri 2009; Muncey 2009) (Figure 4.1). The literature review (Chapter three) highlighted that there is insufficient information available regarding teachers' experiences of preparing young people for school trips. Consequently, it was decided there was a need for exploratory methods to investigate this area which required a flexible approach (Muncey 2009) (Figure 4.1).



Figure 4.1 Methodological design

The overall research question on the preparation practices prior to and during school ski trips was addressed through methodological triangulation. As one method alone was deemed insufficient to answer the research question and objectives (Lukkarinen 2005). A pragmatic framework was adopted since the methods chosen addressed the research question and fitted with the researcher's positionality (section 4.6). The findings from both studies were independent, separable and were used sequentially. This process allowed the second study to confirm the inferences from the first study and to provide further explanation (Teddlie and Tashakkori 2006). A sequential mixed design involved collecting data in an iterative process whereby the inferences made from the first study lead to a formulation of questions for the next strand (Driscoll et al. 2007; Teddlie and Tashakkori 2006) (Figure 4.1). The researcher recognised the value of establishing iterative cycles which involved going back and forth over the data collection and analysis process (Côté and Turgeon 2005). This assisted in refining the questions being asked from the data (Holloway and Galvin 2017).

Initially, quantitative data was collected via a survey in Chapter five to allow large numbers of participants to be targeted (Garbarino and Holland 2009). Several research objectives (one, two, three and four) were explored in the first study (Chapter five). This allowed the researcher to firstly identify common themes and processes occurring across England and Wales and highlight priority issues which needed to be covered in more detail within the qualitative study using interviews (Chapter six). The quantitative study allowed the researcher to achieve a breath of understanding to generalise findings across the population (Palinkas et al. 2015). However, the researcher felt it was essential to include options for other responses if multiple choice questions did not contain relevant options and allow respondents to expand on several questions using open ended questions. The survey design is described in detail in section 5.2.6. In contrast the qualitative study achieved depth of understanding through the participant's specific language (Creswell 2003). This provided contextualisation of the results from the quantitative study (Kroll and Neri 2009) and gathered reflective experiences form the teachers (objective five). Implementation of quantitative and qualitative data was collected

sequentially which allowed both approaches to have equal weighting (Lukkarinen 2005) and address different aspects of the same question (Palinkas et al. 2011). Meta inferences were obtained from the mixed methodology using methodological triangulation (Chapter seven), giving a multi-dimensional perspective into the research question (objective six) (Jack and Raturi 2006). This contributed to confirmation and completeness of findings which helped to develop recommendations and guidelines for practice (Chapter eight) (objective seven). The methodological design is diagrammatically presented in Figure 4.1.

#### 4.9 Sampling design

Within research the sampling design should be detailed which involves making decisions about the sampling scheme and the sample size (Collins, Onwuegbuzie and Jiao 2007). The sampling size indicates the number of participants used within the study, whereas the sampling scheme represents the strategies used to recruit the participants (Onwuegbuzie and Collins 2007). Important considerations for the researcher are how to sample the population of interest, how many people will be involved and what sampling technique to use (Tongco 2007). The methods chosen should be reproducible therefore the researcher has described in detail this systematic process.

Sampling strategies within research can be made either by probability or by non-probability sampling (Ritchie et al. 2003). Probability sampling, or random sampling, is often used for quantitative research (Palinkas et al. 2015; Ritchie et al. 2003; Teddlie and Yu 2007). This sampling technique was chosen within Chapter five to achieve representativeness and allow the researcher to apply the results to the wider population of schools organising school trips within England and Wales (Ritchie et al. 2003; Teddlie and Yu 2007). In contrast, non-probability sampling is often used within qualitative research (Ritchie et al. 2003). Using this method in Chapter six enabled exploration and understanding of the reflective experiences of the processes around school ski trips (Ritchie

et al. 2003; Teddlie and Yu 2007). Within this mixed methods study, the sampling strategies used generated both breadth and depth from the quantitative and qualitative paradigms (Teddlie and Yu 2007).

The sampling technique in the current study comprised of two stages where the first stage was a systematic random sample (Chapter five) and the second a convenient purposeful sample (Chapter six). The first stage (Chapter five) involved systematically selecting secondary schools at equal intervals along an alphabetical published list, the school web directory (Deepspace Web Services Ltd 2013). This provided a comprehensive number of participants which was particularly important as not all will be suitable or willing to participate within the study (Ritchie et al. 2003). Deepspace's pre-existing database allowed the researcher to collate all secondary schools from within England and Wales and select from each County. The second study (Chapter six) involved a convenient purposeful sample. Convenient sampling was chosen as those participants willing to be contacted provided an email address at the end of the survey and were subsequently contacted.

When sampling within mixed methods research the time orientation of the quantitative and qualitative phase can occur at different time points which is termed concurrent or sequential sampling (Creswell et al. 2003; Onwuegbuzie and Collins 2007). Concurrent or simultaneous sampling is characterised by the quantitative and qualitative phase of the study occurring at the same time point and therefore the two paradigms are independent of one another (Onwuegbuzie and Collins 2007). The disadvantage of concurrent sampling is that data collection cannot inform the other (Halcomb and Andrew 2009). In this thesis the researcher used a sequential time orientation where the survey (Chapter five) provided the framework for the development of the interview questions (Chapter six). Using a sequential quantitative to qualitative sampling design is a common technique used within mixed methods (Teddlie and Yu 2007). The researcher additionally needed to identify the relationship between the quantitative and qualitative samples which can either be identical, parallel, nested or multilevel (Creswell et al. 2003; Onwuegbuzie and Collins 2007) (Table 4.5).

A sequential nested relationship (Table 4.5) was utilised where the second study used the initial survey as the sampling frame (Ritchie et al. 2003). Initially using quantitative data collection means the sample will be too large for each individual to be included within the qualitative study (Palinkas et al. 2015) (section 4.10). Therefore, the sample size was reduced using a convenient purposeful approach, by communicating only with the participants willing to be contacted from the first study (Chapter five).

Table 4.5 Relationshi	p of the sample	(Onwuegbuzie ar	nd Collins 2007)
	p or the outliple	(Onwadgbazid ai	

Sample relationship	Explanation
Identical	The quantitative and qualitative phases occur
	components.
Parallel	The same population of interest with different people from this population completing the quantitative and qualitative components.
Nested	The sample selected for the qualitative phase of the study represents a subset from the quantitative phase of the study.
Multilevel	Requires the quantitative and qualitative components to be used on different populations.

# 4.10 Sample size

Researchers should establish sample sizes which are informed by the research objective and reflect the research question (Côté and Turgeon 2005; Onwuegbuzie and Collins 2007). Within quantitative research large samples are collected to enable findings to be generalised to the population (Anderson 2010; Morse 1991). However, this is not the case within qualitative research where researches are obtaining insight into a phenomenon which requires interpretation (Onwuegbuzie and Leech 2007).

Appropriate sample sizes for survey data are important to decrease nonresponse bias and help to increase representativeness to provide typical insights into the phenomena of interest (Sauermann and Roach 2013). Therefore, it was important to over sample within the survey to account for nonresponse by 40-50% (Barlett, Kotrlik and Higgins 2001). The quantitative sample size was determined statistically by the representation of the sample to the total population (Morse 1991) (section 5.2.9). To avoid sampling error and aim to increase the generalisability of the findings, there was inclusion of the entire population which were then selected at random (section 4.9) (Sills and Song 2002).

When determining sample sizes for survey data decisions are made based on the variables that are incorporated into the scale (Barlett, Kotrlik and Higgins 2001). This is important because a dichotomous scale will result in a larger sample size being required than a continuous scale (Barlett, Kotrlik and Higgins 2001). Inadequate sampling restricts the researcher from comparing subsets of the population during the data analysis phase (Kitchenham and Pfleeger 2002). Therefore, a representative subset of the target population was required to produce a valid sample (Kitchenham and Pfleeger 2002) (section 5.2.9).

Within qualitative research there are limited guidelines for estimating sample size (Marshall et al. 2013). Therefore, recommendations from Marshall et al. (2013) will be followed to ensure best practice is achieved. This involved citing recommendations by qualitative methodologies which used similar research problems and designs (Table 4.6) and finally demonstrating saturation (explained below). Sample size considerations in qualitative methods should detail the decisions made for length of interview and sample size (Onwuegbuzie and Leech 2007) which is displayed in Table 4.6.

Within the interviews the sample size should be adequate that redundancy and saturation of the data can be achieved (Marshall et al. 2013; Onwuegbuzie and Collins 2007). Redundancy is the point at which no new information is gained through the introduction of additional data (Williams and Morrow 2009). On the other hand, saturation refers to the themes containing enough data to

acknowledge the diverse perspectives of the phenomenon of interest (Palinkas et al. 2015; Williams and Morrow 2009). Saturation is the gold standard by which purposive sample sizes are determined (Guest, Bunce and Johnson 2006) and this was used to ascertain the final sample size for the second study (Chapter six). Saturation involves "bringing new participants continually into the study until the data set is complete, as indicated by data replication or redundancy" or "when nothing new is being added" (Bowen 2008: 140). The sample size should not be too small that it is difficult to achieve saturation (Onwuegbuzie and Leech 2007). To ensure saturation, it is important to include a selection of individuals that fulfil all aspects of the phenomenon of interest (Palinkas et al. 2015). However, there are no published guidelines to establish when saturation has been reached (Bowen 2008; Guest, Bunce and Johnson 2006) as saturation is often a subjective judgement (Fugard and Potts 2015). Conversely, guidelines do exist for sample sizes although these are estimates and authors have not detailed how they arrive at these estimates (Onwuegbuzie and Leech 2007). More recently, Fugard and Potts (2015) attempted to formalise sampling for thematic analysis (section 4.14) which requires a decision about the theme prevalence and number of desired instances of a theme although these can be difficult to predict.

Search term	Interview type	Number of	Timing of
"teacher interviews AND		interviews	interview
preparation for school			
trips"			
Tal, Bamberger and	Semi structured.	30	15-20
Morag (2005)	Some interviews by		minutes
	telephone		
Anderson, Kisiel and	Semi structured	29	35-60
Storksdieck (2006)	telephone interviews		minutes
Cox-Petersen and	Observations and	11	Not
Pfaffinger (1998)	short semi structured		specified
	interviews		

## Table 4.6 Interview numbers in similar studies

Following careful consideration, the researcher has achieved a sample size through the application of saturation (section 6.2.2) and then confirmed the sample size achieved was congruent by comparison with similar studies conducted in the area (Table 4.6). Data collection in this thesis continued until data redundancy had been achieved to ensure the breadth of information was attained by assessing each new interview (Bowen 2008; Savin-Baden and Major 2013). The researcher conducted and included several interviews (n = 6) past the point of saturation to conclude that the findings had reached saturation and added data were redundant (Marshall et al. 2013). This process ensured sufficient data was collected to develop a depth of understanding of the experiences of teachers and ensured the researcher did not over sample. Sampling more than is required or not including enough of a sample where findings cannot be transferred, presents as an ethical and scientific issue (Francis et al. 2010).

#### 4.11 Data collection methods

Data collection methods will be discussed within this section to highlight the different methods the researcher adopted within the quantitative and qualitative paradigm (Table 4.7). These data collection methods listed within Table 4.7 can be purely quantitative, qualitative or mixed depending on how the researcher collects the data (Brannen and Halcomb 2009). Within mixed method research, surveys and interviews are often used together (Harris and Brown 2010) and these methods are considered below.

Within this thesis, both a survey and interview were conducted separately in two different studies. Firstly, the online survey (Chapter five) was chosen as the best approach to meet the aim, as it enabled a spread of views to be captured. It was also a cost-effective approach to sample a large population in a relatively short period of time (Brannen and Halcomb 2009; Kaplowitz, Hadlock and Levine 2004). The use of a computer-based survey assisted the researcher to develop and design the survey which allowed flexibility in the structure of the

survey (Evans and Mathur 2005) (section 5.2.5). The survey was constructed to allow the responder to complete the survey with ease by tailoring the questions to what they have answered previously within the questionnaire (Evans and Mathur 2005).

Within any type of survey, it is important to acknowledge that questions can be interpreted differently (Feilzer 2010) and do not allow participants to ask for clarification (Harris and Brown 2010). Factors that can affect a respondent's decision to participate in a survey include how long the survey takes to complete and technical flaws within the survey which would reduce the likeliness of the respondents to continue (Fan and Yan 2010). The survey was piloted which identified it would take 15 minutes to complete which was used to inform respondents completing the live study (section 5.2.7).

The survey was disseminated by embedding the URL into an email which is suggested to produce a faster response speed and allowed the respondents to complete the survey at a time which suits them (Evans and Mathur 2005; Kwak and Radler 2002) (section 5.2.9). Online surveys can be filtered or perceived to be junk mail which can limit the amount of responses received (Sills and Song 2002). Additionally, lists with email address can become outdated meaning that these are undeliverable giving bounced requests (Sills and Song 2002) which occurred on 45 occasions out of the 3,014 schools contacted. The online survey was not impacted by the burden of returning through enveloping and mailing (Kwak and Radler 2002) (Table 4.7). Follow up reminders were then sent out with ease to increase the survey response rate (Evans and Mathur 2005).

To increase the response rate within online surveys the design features could include: personalisation by addressing the recipient by name, considering the time of day that the survey is sent to the recipient and sending reminder emails that have a change of wording (Sauermann and Roach 2013). Overall, online surveys have the advantage of quicker transmitting time, lower delivery costs, more design options and data download being readily accessible (Fan and Yan 2010). Data entry is fully automated and does not require double data entry, ensuring data is valid (Fan and Yan 2010).

**Table 4.7** Data collection methods adapted from Brannen and Halcomb, (2009), Fan and Yan (2010), Kaplowitz, Hadlock andLevine (2004), Kwak and Radler (2002).

Data collection method	Advantages	Disadvantages
Online survey	Quick to administer	Predetermined responses
	Offer compete anonymity	<ul> <li>No clarification of response</li> </ul>
	Reach a wider population	Low response rate
	Time efficient	<ul> <li>Perceived as junk mail</li> </ul>
	Cost effective	
	Instant response speed	
	Instant data download	
	Reminder emails can be sent with ease	
Paper survey	Offer compete anonymity	Takes time to send out
	Reach a wider population	Need respondents to return completed surveys
		Cost of postage
Interviews	Clarification of response	Interviewer bias
	Depth of data	• Time
Focus groups	Encourages discussion	<ul> <li>Individuals taking over discussion</li> </ul>
	• Large number participating in short time frame	Individuals remaining silent due to not agreeing
		with consensus
		Difficult to transcribe
		<ul> <li>Arranging time for participants to be together</li> </ul>

Following the survey (Chapter five), interviews (Chapter six) were used as the chosen method of data collection. Interviews can be a sensitive and powerful tool for investigating participants lived experiences (Kvale 2006). The interview aims to replicate a natural conversation between two individuals to gain a meaningful perspective of the interviewee (Savin-Baden and Major 2013). Using open-ended questions gives the participant the opportunity to tell their story, seek clarification and express or elaborate on perspectives in their own words (Bourke 2014; Harris and Brown 2010). However, it is important not to entrust empathy as this can elicit unguarded confidences from the interviewee (Kvale 2006). While this may allow the interviewer to elicit more information it can be considered unethical and manipulative to the participant (Harris and Brown 2010).

Face to face interviews are the most frequently used technique (Savin-Baden and Major 2013), although, telephone interviews have become increasingly common (Brannen and Halcomb 2009; Oltmann 2016). Telephone interviews were more convenient in enabling interviews to be completed with ease and more convenient to participants work commitments since appointment times were easily changed. When conducting telephone interviews these are seen to result in a lack of contextual and nonverbal data which may hinder the rapport building (Irvine, Drew and Sainsbury 2013). However, the absence of visual cues is not always critical and creates a higher perception of confidentiality and anonymity (Oltmann 2016) which may promote increased disclosure (Lechuga 2012). Focus groups on the other hand allow the researcher to capture a range of opinions and social interactions although this requires a skilled group facilitator to control situations and ensure that all participants' voices are heard (Brannen and Halcomb 2009; Onwuegbuzie and Leech 2007) (Table 4.7). Additionally, this requires time and travel for the participants to come together (Oltmann 2016). Therefore, for pragmatic reasons telephone interviews were chosen over face to face interviews and focus groups due to the geographical distribution of teachers across England and Wales. This enabled the respondent to choose a time that was appropriate to them.

**Table 4.8** Types of interviews adapted from Doody and Noonan (2013), Savin-Baden (2013)

	Characteristics	Positive	Negative
Structured	Same questions are asked to each interviewee with the same words which allows for common information across participants	<ul> <li>Interviewer refrains from inserting own opinions which reduces the effect of the interviewer bias on the results</li> <li>Good to minimise variation in questions when being conducted by a research team</li> <li>Allows easy replication and comparison</li> <li>Time efficient</li> </ul>	<ul> <li>Restricts exploration of issues not anticipated</li> </ul>
Semi structured	Develops a schedule to follows pre-set questions but can include additional questions and prompts	<ul><li>Keeps interaction focused</li><li>Flexibility with questions</li></ul>	<ul> <li>Cannot offer interviewer unique perspective</li> </ul>
Unstructured	There is no interview protocol but a spontaneous generation of questions	<ul> <li>Flexibility with questions</li> <li>Rich data can be generated</li> </ul>	<ul> <li>Need a deep understanding of the topic</li> <li>Requires speaking to interviewees on multiple occasions</li> <li>Takes considerable amount of time</li> <li>Data gathered may not be comparable with other interviewees</li> <li>Unsuitable for novice researchers</li> </ul>

There are a range of formats for conducting interviews which are structured, unstructured and semi structured (Doody and Noonan 2013) (Table 4.8). The researcher chose a semi structured interview format where an interview schedule was developed (section 6.2.4). This followed pre-set questions but allowed the researcher to deviate and ask additional questions as needed. This type of interview is useful when there is only one opportunity to interview someone and helps to keep the interaction focused keeping to the specified time (Savin-Baden and Major 2013) which was set to 15 minutes (section 6.2.4)

#### 4.12 Rigour

Within quantitative and qualitative studies, researches try to ensure that their research is credible (Golafshani 2003). However, the quality criteria for each paradigm are judged separately as it is deemed inappropriate to use the same criteria for both paradigms (Sparkes 2015). In the quantitative paradigm, the criteria for judging rigour are well established and include measures such as validity, reliability, generalisability and objectivity (Angen 2000; Sparkes 2015). Validity refers to the accuracy of the test and measuring what it is supposed to measure (Hall and Getchell 2014) which was established in the pilot study (section 5.2.7). Reliability is the degree a research instrument can obtain the same data by measuring consistently every time under the same conditions with the same participants (Yilmaz 2013). In this study, the survey tool was measured using test-retest reliability (section 5.2.8) which is the repeatability of a test (Hall and Getchell 2014). Objectivity or interrater reliability reduces biases in results through ensuring two researchers score the participants in the same way (Hall and Getchell 2014). However, within the qualitative paradigm these criteria are unworkable and qualitative methods cannot be subjected to the same criteria (Sparkes 2015). Lincoln and Guba (1985) proposed four criteria within qualitative methods to demonstrate rigour and trustworthiness (Table 4.9). These criteria are credibility (section 4.12.1), transferability (section 4.12.2), dependability (section 4.12.3) and confirmability (section 4.12.4) (Lincoln and Guba 1985).

**Table 4.9** Strategies to determine rigor in qualitative research adapted from Houghton et al. (2013), Lincoln and Guba (1985).

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Transferability	Can the findings be	Thick descriptions	Thick descriptions by using participant quotes to
(External validity)	applicable in similar		provide a sense of understanding to the reader
	situations		(section 6.3)
			<ul> <li>Data redundancy and theoretical saturation</li> </ul>
			(section 6.2.6)
Dependability	Can the findings be	Audit trial	NVivo was used to assist with storage of data and
(Reliability)	repeated and are		provides an audit trail of the emergent findings
	consistent		(Holloway and Galvin 2017) (section 6.2.6)
Confirmability	The findings are	Audit trial	Using direct quotes within the findings (section
(Objectivity)	shaped by the	Triangulation	6.3)
	respondents and not	Reflexivity	<ul> <li>Investigator triangulation (section 6.2.6)</li> </ul>
	researcher bias	<ul> <li>Bracketing (Tufford and</li> </ul>	Reflexivity (section 4.8) and bracketing (section
		Newman 2012)	4.12.4)

It has been acknowledged that these criteria are the gold standard in qualitative research and are consistently cited to replace the criteria within the quantitative paradigm (Yilmaz 2013). These terms acknowledge the complexity of the qualitative paradigm which requires the researcher to immerse themselves in the research and act as the research instrument (Golafshani 2003).

Immersion requires the researcher to become acquainted with the environment of data collection, engagement with the data analysis process through repeated reading, reviewing and summarising of the data (Lincoln and Guba 1985). These processes occurred within transcription (section 6.2.5) and during thematic analysis (section 6.2.6). In this thesis the researcher tried to establish rigour and transparency by producing a clear account about how the research was carried out at each stage (Cooper and Endacott 2007; Lincoln and Guba 1985).

## 4.12.1 Credibility

Credibility is the confidence or trueness of the findings and this can be enhanced though triangulating using different sources, different methods, investigators and through methodological triangulation (Casey and Murphy 2009; Houghton et al. 2013; Lincoln and Guba 1985) (Chapter seven). In this thesis, data were gathered from multiple sources to ensure the completeness of data and to maximise the potential for insight into the phenomena (Houghton et al. 2013). In this instance, triangulation helped to establish the credibility of the findings (Bowen 2008) and increased confidence in the findings (Guion 2002) which has been discussed previously in section 4.5. Direct quotations from the participants were used in section 6.3 to ensure the findings were easier to understand (Bekhet and Zauszniewski 2012; Côté and Turgeon 2005). Member checking is often used following the transcription of the interviews (Houghton et al. 2013), which is a process of returning the analysis to the

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respondents for their feedback (Angen 2000; Côté and Turgeon 2005). It was

not necessary to use member checking due to the investigator recording the

interviews before transcription and not wanting to further burden the participants. The credibility was enhanced by the researcher using peer debriefing and investigator triangulation (Côté and Turgeon 2005).

#### 4.12.2 Transferability

The findings are transferable if these can be conveyed and applied to similar situations (Yilmaz 2013). Providing rich descriptions, the reader can make decisions about the findings and whether this can be generalised to other contexts (Côté and Turgeon 2005). Within this thesis the researcher has described the profile of respondents (section 5.1.3) and presented how respondents prepare themselves for a ski trip (section 6.3.1) to allow the reader to make generalisations.

#### 4.12.3 Dependability

Integrity of the data is achieved by providing enough detail to allow replication of the design (Williams and Morrow 2009). This process involves articulating the design, recruitment of participants, interview schedule, transcription process and data analysis procedures (Williams and Morrow 2009). These design features have been explicitly communicated throughout each of the method sections 5.2 and 6.2. Evidence of the rich data was expressed in the findings (section 5.3) to ensure sufficient quality, quantity and trustworthiness of the data (Williams and Morrow 2009). Using a computer package, which is discussed in section 4.13, an audit trial was maintained, and this increases the rigour of the research process (Houghton et al. 2013).

#### 4.12.4 Confirmability

To maintain trustworthiness there is a balance between participant meaning and the interpretation of the researcher (Williams and Morrow 2009). Accuracy was pursued through investigator triangulation (Lincoln and Guba 1985). A second researcher was involved with the data analysis process of the interviews to help reduce bias and increase the robustness of the findings (Thurmond 2001). A subset of five interviews was coded separately for verification of codes and results are presented within section 6.2.6.

Bracketing is a method used within qualitative research to increase the rigor of a research project introduced by Husserl (Giorgi 2009; Tufford and Newman 2012). Bracketing involves the researcher separating their points of view and judgements from the participants' (Yilmaz 2013). For this to occur, does not mean researchers destroy or forget past experiences, instead this technique brings awareness so that the researcher can try to remain objective during the research process (Giorgi 2009). There were three methods of bracketing used within this thesis which enabled the researcher to establish areas of knowledge, beliefs and biases throughout the engagement of the project. Writing a literature review to uncover previous research was pivotal in uncovering existing assumptions or previous experiences that may have been forgotten (O'Halloran et al. 2018). This is often controversial within bracketing as the "process of the literature review may inevitably affect our preconceptions on the topic" and form bias (Chan, Fung and Chien 2013: 4). However, without completing a literature review, researchers cannot formulate the research questions or have confidence in meeting the gatekeeper's criteria within the ethics process (Chan, Fung and Chien 2013; O'Halloran et al. 2018). The researcher conducted pilot work for both the survey (section 5.2.7) and interviews (section 6.2.3) to understand how to manage the questions that were delivered in the two studies. These methods of bracketing allowed the researcher to have a heightened awareness of the risk of leading questions or making assumptions without asking for clarity which would interfere with data collection and/or analysis (O'Halloran et al. 2018; Tufford and Newman 2012). The researcher engaged

in extensive discussions with the supervisory team during the analysis and synthesis of the studies which may uncover underlying bias (O'Halloran et al. 2018).

It is recommended that bracketing should take place prior to, during and throughout the data collection process (O'Halloran et al. 2018) using a reflexive approach. Reflexivity requires researchers to express and manage their subjective experience of the phenomena of interest (Lincoln and Guba 1985). Positional reflexivity has been articulated (section 8.5) to express how past/present experiences and personal characteristics play a role within the interactions with and understanding participants (Lincoln and Guba 1985).

Drawing on the work of Chan, Fung and Chien (2013), reflexivity enabled the researcher to identify their thoughts and feelings which helped them to bracket their preconceptions. Examples of this (section 8.5) are key to help the researcher position them self, to be reflexive and become aware of their own preconceptions. However, during data analysis the researcher recognised that they needed to return to the positionality statement to include areas in which unexpected findings emerged from the data. This iterative cycle enabled the researcher to become more aware of their own biases and their own knowledge.

#### 4.13 Computer aided qualitative data analysis

Computer aided qualitative data analysis (CAQDAS) has become a widely accepted strategy for the management of qualitative data (Lewins 2008). CAQDAS was utilised within section 6.2.6 to assist with the management and analysis of the qualitative aspects of the research. Data management is essential for a qualitative researcher to be able to keep track of the data during analysis (Holloway and Galvin 2017; Miles and Humberman 1994). There are a variety of CAQDAS on the market to aid qualitative synthesis (Bringer, Johnston and Brackenridge 2004). One of the most popular, NVivo,

was chosen for pragmatic reasons: the researcher had prior training in the use of this package and a user licence was available at their institution. NVivo is a data management package which supports the researcher during the data analysis process (Zamawe 2015), specifically within coding and data retrieval (Woods et al. 2016). It provides transparency to the process which was necessary to show accountability. This has been possible due to the CAQDAS which is rarely seen with manual methods (Woods et al. 2016).

The appropriateness of using CAQDAS in qualitative analysis has been considerably debated (Bringer, Johnston and Brackenridge 2004). Specifically, on the issue whether CAQDAS changes the way the researcher immerses themselves into the data and the way analysis is conducted (Bringer, Johnston and Brackenridge 2004). It must be emphasised that the researcher would have gone through the same process manually and NVivo assisted in the tasks but in no way did NVivo analyse the data (Bringer, Johnston and Brackenridge 2004). NVivo works well with a thematic analysis approach since the presence of nodes within the software allows for the creation of codes and the discovery of themes (Zamawe 2015) which was used to explore the qualitative study (section 4.14 and 6.2.6).

#### 4.14 Thematic analysis

Thematic analysis is a commonly used method for encoding qualitative information which searches for themes or patterns within the data (Boyatzis 1998). Thematic analysis has been described as a form of pattern recognition and provides a robust, systematic framework for coding qualitative data (Braun and Clarke 2014; Fereday and Muir-Cochrane 2006).

To address the research aims and approach, thematic analysis was chosen for pragmatic reasons. Thematic analysis fitted the design of the methodology and enabled theory to be developed through an exploratory framework. This

approach enabled themes to be identified in the data to describe the practices in the organisation of school ski trips. Thematic analysis is an easily accessible robust technique, especially for researchers producing policy-oriented research (Braun, Clarke and Weate 2016). Additionally, thematic analysis does not require a detailed and technological knowledge of approaches as it is not linked to any pre-exciting theoretical framework, this gives the researcher flexibility in how this approach is used (Braun and Clarke 2006; Braun, Clarke and Weate 2016). A detailed account of the thematic analysis process is described in section 6.2.6.

#### 4.15 Ethical consideration and approval

Prior to seeking ethics approval, planning of the project was essential to ensure no ethical issues or dilemmas were faced during the research process. Firstly, all researchers must be guided by the principles of nonmaleficence, beneficence, respect for autonomy and justice (Gillon 1994).

Ethics approval was obtained prior to data collection through research governance set according to Coventry University (for confirmation of this, see Appendix one and two). The studies met the University's ethical guidelines to research in respect of confidentiality, anonymity, data protection and storage of data. The participant information sheets (Appendix three and four) contained an outline of all procedures, benefits and risks of participating, voluntary participation, the purpose of the study and contact information of the researcher.

Informed consent was obtained before proceeding with the survey and interviews (section 5.2.3 and 6.2.1). This set out details of the project and assured the participant of anonymity (Miles, Huberman and Saldaña 2014). At any time during data collection and up to two weeks following completion, participants were free to withdraw without needing to provide reasons. It was not compulsory to participate in the studies and no incentives were offered.

Chapter 5: Examining the current practices surrounding the school ski trip: The quantitative survey study

## 5.1 Introduction

The literature review in Chapter two highlighted that participation in school ski trips continues to grow and contributes to the largest source of new skiers (Crystal 2012). With the increasing popularity of skiing and a growth in young people participating in these types of activities injuries are an inventible part of the process (Sulheim et al. 2011). While there are no statistics available to describe injuries being sustained on school ski trips across England and Wales, retrospective research has shown young people are an at-risk population (Sulheim et al. 2011) (section 3.5.3). The literature review in Chapter three highlighted that skiing injuries are problematic in young people due this age group being widely affected and because of the long-term consequences this can have on health (section 2.9).

For risk reduction to be effective, knowledge of aetiological factors that influence injury was required (Bahr and Krosshaug 2005; Carter and Micheli 2011). Chapter three provided an insight into the risk factors present within skiing and established a complex interaction of multiple risk factors which are important to acknowledge within the aetiology of injury (Meeuwisse et al. 2007). Risk factors can change throughout the duration of a ski trip (section 3.3, Figure 3.2). Through cumulative day to day experiences an individual may be subjected to the same or different risk factors (Meeuwisse et al. 2007). Subsequently, the review highlighted the considerable value of exploring whether secondary schools within England and Wales provide consistent and appropriate information prior to the ski trip. It was important to establish if schools engage in any activities that reduce the risks to young people during the trip. There are no known reports to date that have aimed at identifying what secondary schools are currently doing to prepare young people for school ski trips. To ensure adequate measures are in place for all young people, researchers and clinicians need to determine what is currently occurring within the preparation of a school ski trip. From this, appropriate recommendations can be established to educate and inform teachers of the information and advice given to young people. It is vital to prepare young people for the demands of skiing, to promote enjoyment and reduce the likelihood of injury.

The aim of this quantitative survey study was to achieve the research objectives set about in section 1.4 (objectives one to four) which provided an overview of what currently occurs in the preparation of and during school ski trips within England and Wales and evaluated whether schools were consistent in their management. Given the multifactorial influences which can increase risk of injury (Chapter three) it was important to establish if schools engage in any activities to reduce these risks to pupils during the trip. Such interventions will support knowledge in establishing best practice for teachers organising ski trips.

#### 5.2 Method

#### 5.2.1 Sample

Teachers organising ski trips from 270 secondary schools across England and Wales responded to an online survey. The distribution of participating schools by region is represented diagrammatically in Figure 5.1. School type consisted of 86% state schools and 14% private schools.




# 5.2.2 Inclusion criteria

To be included in the study, schools had to be secondary schools within England and Wales and coordinated ski trips within the two years prior to the survey being completed. Scotland was excluded due to mountainous regions (ski resorts) in close proximity, making the activity more commonplace (Higgins 2002).

### 5.2.3 Ethics and Governance

Ethics approval (Appendix one) was obtained prior to any collection of data through standards set according to Coventry University (section 4.15). The participant information sheet (Appendix three) and informed consent preceded the initial questions of the survey. Informed consent was obtained through participants completing the online consent form and without consenting to these questions, the participant was not able to proceed with the survey.

## 5.2.4 Data protection

All surveys were administered using an online questionnaire platform through 'Online Surveys' (Jisc 2020). The online platform collected and stored the data which were encrypted and only accessible by the researcher. Data were anonymised by giving each school a number to represent them. Hard copies of information were kept secure by means of a locked filing cabinet accessible only by the researcher and supervisor. Procedures for handling, storing and destruction of data followed the Caldicott principles (Crook 2003) and data protection act 1998 (Government 1998).

## 5.2.5 Survey design

The online survey was designed by the researcher as there was no pre-existing instrument assessing safety information delivered to pupils attending school ski trips. Initially, a meeting was conducted with the Learning and Achievement Consultant from the local City Council to inform the questions of the survey. Subsequently, a meeting was conducted with a secondary school teacher to gather information and themes to inform the survey. A literature search was conducted to identify existing survey questions that could be used. As a result, questions 9, 32a, 32b, 32c, 32f were adapted from QA Research (2008) to help

ensure content validity of the questions. The remainder of the questions were developed to enable the research question and objectives to be answered and were informed by the literature review (Appendix five).

## 5.2.6 Survey layout

The survey was developed, and feedback given aiming to ensure that it was simple to follow and easy to complete. The initial page welcomed participants to the study; following which a participant information sheet provided a brief and clear introduction to the study. The informed consent was situated on the subsequent page therefore participants were not able to proceed without agreeing to the terms.

The survey included classification questions to gather background information about the school, information concerning year groups that were offered ski trips, staff to pupil numbers, length of ski trip and number of hours spent on the piste. The remainder included behavioural questions related to information about ski trip preparation and practices occurring on the piste during the ski trip. Attitudinal questions were used in the final section in which a 5-point Likert scale (greatly agree to greatly disagree) collected opinions and views of school respondents. A Likert scale was chosen due to this being a widely used method for attitude measurement which was easy to administer and analyse (Camparo 2013).

Each page of the survey featured a page counter to verify how many pages were left until completion. Every question was numbered and grouped by headings following a logical progression which included; background information, ski preparation, during the ski trip and views about ski trips. The survey featured thirty-two questions with a mixture of open and closed questions, multiple choice questions which included scaled questions and Likert scales (Appendix six). No compound questions, leading questions, questions containing double negatives or ambiguous questions were used in

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order to avoid inaccuracies in the data being measured (Kelley et al. 2003). Several questions allowed multiple responses to be given producing a number of responses for that particular question. Three open-ended questions were constructed to gather additional information about a question. Respondents selecting 'Other' on eight of the questions were requested to specify an answer within the comment boxes.

## 5.2.7 Pilot study

Prior to the administration of the survey, a pilot survey was sent to ten staff members within Coventry University to test the clarification of the questions and the functionality of the survey. The pilot study identified that one question would not allow the user to progress without inputting a comment; this was subsequently changed for the main survey. Questions were modified or clarified based on the feedback received. The piloted survey helped to ensure construct validity (section 4.12) by assessing whether the survey addressed the aims of the study. Completion time for the survey was recorded to take 15 minutes and this was reported within the participant information sheet (Appendix three).

# 5.2.8 Test-retest reliability

The reliability of the survey was an important factor to consider. One characteristic of a reliable instrument is stability, where participants respond in a similar way at two different time points (Oluwatayo 2012). The test-retest reliability was measured with nine respondents who had completed the survey twice within a seven to eight-month gap between each response. This interval was determined to be sufficiently long to avoid respondents remembering and repeating the answers they had given on the first survey but not so long that situational factors changed (Cooper 2011). Respondents were only asked to fill in the questionnaire once but due to reminder emails being sent out to all, nine

respondents filled in the questionnaire a second time This was known due to names and school location matched on these nine instances.

The results were analysed using IBM SPSS statistics for windows, version 20 (Armonk, NY: IBM Corp). Test-retest reliability was assessed using the intraclass correlation coefficient (ICC) and were calculated between time point one and time point two (Weir 2005). The agreement of categorical items (Likert scales), continuous and dichotomous items were analysed with a two-way random effect's single measures intraclass correlation coefficient (Singh et al. 2012). The survey showed acceptable test-retest reliability across the two time points (ICC = 0.828 - 0.965) and were compared to the accepted industry standard for reliability coefficients developed by Cicchetti and Sparrow (1981); 'excellent' ( $\geq 0.81$ ), 'good' (0.61 - 0.80), 'moderate' (0.41 - 0.60), 'poor' ( $\leq 0.40$ ).

## 5.2.9 Survey administration

A total of 3,014 schools were contacted by email in England and Wales using systematic random sampling. From 2013 statistics (GOV.UK 2013; Independent Schools Council 2018; Welsh Government 2013) a total of 4,524 schools were recorded in England and Wales and 67% (3,014) of schools were contacted from the total population of schools in England and Wales.

School email addresses were gathered by using the school's web directory to locate websites for each school (Deepspace Web Services Ltd 2013). Secondary schools were randomly sampled from each list of counties by selecting schools at equal intervals from the alphabetical list. A general enquires email address was obtained from each school webpage and addressed to the attention of the ski trip organiser (teacher or other) for the school (Appendix seven and eight). The email was addressed to the ski trip organiser for the email to be passed onto the most appropriate person. The email contained information about the study, contact details of the researcher and a web link to the online survey. Schools which did not have an email contact

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address or were only contacted through an online form were not used in this study and the next school on the list were used.

The online survey was live from May 2013 to March 2014 to fully capture and sample as many schools in England and Wales (Figure 5.2). The survey first targeted 1,972 English schools during May 2013 with a response rate of 106 completed surveys. The survey was subsequently sent out again in June 2013 to the same 1,972 schools with an additional 69 completed surveys. In January 2014, the survey was sent out to a new collection of English and Welsh schools (n = 1,042) in which 87 responses were gathered, with a reminder email being sent in February 2014 with an additional 8 responses. Including the 44 schools that replied that they do not organise ski trips and the 270 completed surveys the overall response rate was 10% across England and Wales. This final figure discounted the nine schools which filled in the survey data twice. The first response was recorded in each of these nine schools.

Written online information and instructions about the study were given to each respondent (Appendix three). There was an opportunity to ask any questions by contacting the researcher by email or telephone. Contact details were given on both the email sent to the school and provided at the beginning of the survey (Appendix three, seven and eight). Respondents were not able to familiarise themselves with the questions prior to the survey and there was no opportunity to pause and complete the survey at a later stage. Every question within the survey had to be completed for the survey to be processed.



Figure 5.2 Timeline of when schools were contacted

### 5.2.10 Statistical analysis

Statistical analysis of the data was conducted using IBM SPSS statistics for windows, version 20 (Armonk, NY: IBM Corp). Statistical significance was set at P < 0.05 a priori. Descriptive statistical methods were used to calculate percentages for each response rate. A Chi-squared test ( $\chi^2$ ) was used to identify if any of the response rates were statistically significant between the observed and expected frequencies. The responses to what briefing the parents and young people receive were cross tabulated with regions and type of school to identify if there were any associations using a Pearson Chi-Square test. A Mann-Whitney U test was used to identify differences in response rate for the 5-point Likert scales for type of school and respondents' views towards school ski trips.

Open ended questions where respondents were able to leave additional information was subjected to content analysis. Content analysis is a systematic coding and categorising approach which uses three phases: preparation, organising and reporting (Elo et al. 2014; Vaismoradi, Turunen and Bondas 2013). Content analysis was used to identify patterns/themes across the qualitative data which provided frequency counts to allow for quantitative analysis of qualitative data (Hsieh and Shannon 2005; Kondracki, Wellman and Amundson 2002). Respondent extracts were coded with their participant number (e.g., participant one).

#### 5.3 Results

## 5.3.1 Profile of respondents

The respondents completing the survey were from a broad spectrum of positions within the school. Heads of department (30%, n = 80) and subject

teachers (27%, n = 72) were the most frequent respondents taking part in the survey (Figure 5.3). Respondents selecting 'Other' boxes (25%, n = 67) comprised of assistant heads (7%, n = 21), heads of year (3%, n = 8) heads of house (3% n = 8), achievement coordinators, bursars, business manager, career development and educational visits organisers.



Figure 5.3 Respondent's position within the school (n = 270)

# 5.3.2 Background

The average staff to pupil ratio ranged between seven to nine pupils per teacher in each ski trip. Respondents are predominantly offering ski trips to school years eight (82%, n = 221), nine (86%, n = 233), ten (90%, n = 242) and eleven (74%, n = 200) (Figure 5.4). Year seven (47%, n = 126) and sixth form (58%, n = 157) years were not as frequently involved with school ski trips. The length of a school ski trip was typically seven to nine days long (93%, n = 250) with five to six days (98%, n = 265) being spent on the piste. A total of four to five hours was spent on the piste per day in 88% (n = 237) of schools, with 8% (n = 22) spending six hours and 4% (n = 11) spending seven to eight hours on the piste per day.



Figure 5.4 School years offered school ski trips (n = 270)

## 5.3.3 Ski preparation

Table 5.1 details basic precautions discussed by the school with parents and young people prior to the ski trip and with young people at the ski resort. Over 90% (n = 243) of respondents informed parents and young people about standards of behaviour expected, alcohol consumption, wearing appropriate clothing and the use of sun protection prior to the ski trip. Awareness videos were not shown to parents and young people in over 70% (n = 189) of respondents. Fifty nine percent (n = 159) of respondents did not show young people awareness videos either prior to or at the ski resort.

No significant differences (P > 0.05) were found between the ten regions in relation to the information shared with parents prior to the ski trip. Young people were informed about similar information prior to and during the ski trip across the regions (P > 0.05). Prior to the ski trip there was a significant difference across the regions for young people being briefed about alcohol consumption restrictions ( $\chi^2(9) = 20.147$ , P = 0.017). The regions that did not consistently inform young people about alcohol consumption restrictions prior to the ski trip was East Midlands (44%, n = 4) and South East (21%, n = 10), all other regions

informed young people in over 80% of cases. There was no significant difference ( $\chi^2(9) = 11.469$ , P = 0.245) between the regions regarding the briefing of alcohol consumption during the school ski trip. A significant difference was found across the regions regarding the information provided about the FIS safety code at the ski resort ( $\chi^2(9) = 17.198$ , P = 0.046) with respondents from Wales and East Midlands informing young people in 17% (n = 6) and 56% (n = 9) of cases, respectively. In all other regions, respondents reported briefing young people in over 75% of cases. Similarly, there was a difference across the regions about giving information regarding the use of ski lifts ( $\chi^2(9) = 21.301$ , P = 0.011) with respondents in Wales and East Midlands informing young people 63% (n = 5) and 38% (n = 3), respectively. The other eight regions had respondents inform young people in over 80% of cases.

**Table 5.1** Percentage of respondents who inform parents and young peopleon key ski preparation topics (n = 270)

	Parents prior	Young people	Young people
	to ski trip % (n)	prior to ski trip	at resort % (n)
		% (n)	
Standards of behaviour	99 (266)	97 (263)	77 (207)
Alcohol consumption	93 (252)	91 (247)	64 (172)
FIS safety code	66 (178)	76 (206)	85 (229)
Use of equipment	44 (119)	73 (196)	87 (235)
How to walk in ski boots	19 (50)	55 (148)	83 (223)
How to use ski lifts	18 (49)	47 (127)	88 (238)
Awareness videos shown	14 (37)	28 (75)	30 (82)
Appropriate clothing	98 (264)	96 (259)	76 (206)
Sun protection	98 (265)	97 (261)	83 (223)
Remaining hydrated	82 (222)	84 (227)	86 (232)
Effects of altitude	72 (194)	75 (202)	77 (207)
Fatigue	69 (187)	74 (201)	84 (228)
	1		

A significant difference was found between state and private schools for information disseminated to the pupils prior to the trip concerning the effects of fatigue ( $\chi^2(1) = 5.734$ , P = 0.017), with state schools informing young people in 70% of cases compared to 30% in private schools, although this was not statistically different for information given during the trip ( $\chi^2(1) = 0.974$ , P = 0.324).

The knowledge gained by teachers for preparing young people for ski trips was gathered from a variety of sources: previous school ski trips (90%, n = 244), personal ski trip experience (85%, n = 230) and attending courses such as Snowsport England (58%, n = 157). Additional sources of information were obtained from tour operators (48%, n = 129), reading educational publications (19%, n = 50), websites (19%, n = 51) and word of mouth (27%, n = 73). Respondents commented that other sources of information came from dry ski slope lessons, ski representatives and ski clothing companies attending parent information sessions (3%, n = 23).

In preparation for the ski trip, 22% (n = 60) of respondents reported all pupils to have had ski lessons prior to the school ski trip, 26% (n = 69) reported no pupils have had ski lessons before the school ski trip. The remainder of the respondents (52%, n = 141) reported some pupils to have organised their own ski lessons before the ski trip.

There was a statistical difference ( $\chi^2(1) = 31.348$ , P < 0.001) between respondents who screened and did not screen young people prior to the school ski trip. Over two thirds of respondents (67%, n = 181) do not screen pupils before attending a school ski trip. There was no association between region (P = 0.241) and type of school (P = 0.156) when comparing which respondents pre-screen pupils. Respondents that did screen students reported how this was measured in which six common themes emerged (Figure 5.5). Health screens were the most commonly used method to screen pupils before attending school ski trips (61%, n = 54), conversely 2% (n = 2) reported that all pupils were able to attend due to equal opportunities. One respondent reported; *"screening discounts pupils who are not fit and active"* (participant two). Young people's physical fitness (17%, n = 15) and behaviour (21%, n = 19) are observed prior to the ski trip. With nineteen percent (n = 17) of respondents discussing pupil behaviour with other staff on each young person's suitability to attend. Additionally, a small minority of respondents use prior ski lessons to observe pupils to ensure that they are capable of skiing (4%, n = 4).



**Figure 5.5** Common themes from methods of screening used prior to a school trip (n = 270)

Fifty three percent (n = 144) of respondents reported not undertaking any physical preparation prior to the school ski trip with no differences observed between types of school (P = 0.781) or school region (P = 0.09). Reasons for not carrying out any physical preparation were mixed, ranging from physical preparation had never been considered (32%, n = 46) to lack of time available to implement and supervise (27%, n = 39) (Figure 5.6). Nineteen percent did not feel that any physical preparation was needed or important.



**Figure 5.6** Reasons for not completing physical preparation (n = 144)

Using content analysis to determine the quantity of responses for other reasons for not carrying out any physical preparation (Figure 5.7, n = 32) before the ski trip yielded: 25% (n = 8) of respondents considered young people to already be fit and active due to the PA lessons which were embedded in the curriculum. This is highlighted in the next extract; "all pupils do a lot of sport at school" (participant 63). One of the most common themes for not carrying out any physical preparation was that young people were given advice to carry out PA in their own time (47%, n = 15); "pupils are told what is required and the consequences of not preparing" (participant 168). One respondent suggested that, from past experiences; "physical preparation does not work" (participant 161). Some respondents believed that physical preparation did not take place since young people attending ski trips had skied before or young people were encouraged to attend ski lessons prior to the ski trip, 6% (n = 2) and 13% (n = 4), respectively. Physical education teachers were the largest group to implement physical preparation with the young person prior to the ski trip ( $\chi^2(3)$ ) = 146.317, *P* < 0.0001) (Figure 5.8).



Figure 5.7 Themes for not completing physical preparation (n = 32)



**Figure 5.8** Who implements the physical preparation? (n = 126)

The emerging themes from who was responsible for the physical preparation are diagrammatically represented in Figure 5.9, n = 75. The young person (25%, n = 19) and their parents (33%, n = 25) were reported to take responsibility for implementing the physical preparation. Ski instructors were

also mentioned as people who implemented physical preparation for skiing (33%, n = 25).



**Figure 5.9** Themes for who was responsible for the completion of the physical preparation (n = 75)

## 5.3.4 During the ski trip

Respondents considered that the majority of pupils were beginners (38%, n = 102) or intermediate skiers (39%, n = 105) (Figure 5.10). Within the survey, beginners were categorised as those using the snow-plough technique most of the time whilst skiing and intermediates skiers used a mixture of the snow-plough and parallel techniques; advanced skiers used, predominantly, the parallel technique (section 3.5.4). The level of skiing ability of the majority of young people attending school ski trips was at a beginner level or had never skied (57%, n = 154).



**Figure 5.10** Level of skiing ability for the majority of pupils attending school ski trips (n = 270)

Predominantly, respondents reported that all young people were invited to take part in organised ski lessons during the school trip (97%, n = 263). The majority of respondents reported the ski instructor stayed with the group the entire time when on the piste (86%, n = 233). Ten percent (n = 28) reported the instructor stayed with the group the majority of the time, 3% (n = 8) the minority of the time and 1% (n = 1) none of the time. Conversely, for 97% (n = 263) of respondents there were no circumstances where young people were allowed to ski without adult supervision. The 3% (n = 7) that could ski without adult supervision accounted for those separated from the ski group, those over the age of 18 years or advanced skiers with written consent from parents. Seventy six percent (n = 205) of school staff did not take young people skiing without a resort instructor. The 24% (n = 65) of respondents that took young people skiing were consequently asked what qualifications they possessed (Figure 5.11). The two previously mentioned courses, ASCL and SCO (section 2.8 and 3.5.12), were the most commonly held qualification with 83% (n = 54) of respondents possessing the ASCL and 42% (n = 27) holding the SCO. Seventeen percent (n = 11) of the respondents who took young people skiing without a course instructor had no qualifications. The British Association of Snowsport Instructors (BASI) was held by 12% (n = 8) of respondents who took young people skiing. The other 12% (n = 8) of responses who took young people skiing without a resort instructor were principally if the young person became separated from the group. This is highlighted in the next extracts; "only to catch up with group, taking pupils off the mountain or helping beginners" (participant 154), "only if separated from the group or in the event of an injury of other pupils, not for tuition" (participant 110).





The question was asked whether a warm-up and cool down were completed before and after a ski day. Eighty three percent (n = 233) of respondents thought these were completed the majority of the time with 12% (n = 33) not occurring at all. The other 5% (n = 14) were unsure if this occurred. Helmets were commonly expected to be worn by pupils in 97% (n = 263) of responses.

The number of structured breaks in a ski day was commonly between one to three breaks (91%, n = 246) with 9% (n = 24) of respondents taking four to five structured breaks (Figure 5.12). One respondent did not have structured breaks incorporated into the ski day, but they did take time for comfort breaks, lunch and for fatigue. Lunch was the greatest reason for breaks to be incorporated into the ski day (Figure 5.13); "*lessons are two hours in the morning then back* 

to the hotel to recover and have a proper lunch, the afternoon session is two hours, then there is an optional additional hour" (participant 46). Seventy-seven (n = 207) percent of respondents suggested that the majority of pupils carried their own water, drinks or snacks whilst on the piste. Further themes that emerged for breaks were if instructors decided a break was needed; *"instructors will assess the needs of the group and make breaks accordingly*" (participant 17), *"natural breaks occurring due to instruction*" (participant 160).



Figure 5.12 Number of structured breaks incorporated into a ski day (n = 270)





### 5.3.5 Views about ski trips

Half of respondents (n = 135) greatly agreed or slightly agreed that the fear of legal action was a consideration when organising ski trips. Ninety one percent (n = 246) of respondents did not have concerns about pupil behaviour during school ski trips. There was collaborative agreement that school ski trips were a valuable educational activity (100% greatly agreed or slightly agreed, n = 270) and respondents largely agreed that they would like to have organised ski trips more regularly (74%, n = 200). Sixty three percent (n = 170) of respondents had concerns about injuries during the ski trip while 94% (n = 254) felt confident with dealing with injuries (Figure 5.14). Fifty one percent (n = 138) of injuries were not reported to the local authority.

Private and state schools did not differ in response to "ski trips can be a valuable educational experience" (U = 4411, *ns*, z = -0.67), "should ski trips be organised more regularly" (U = 3888, *ns*, z = -1.42), "pupil dicipline is a concern" (U = 4374, *ns*, z = -0.05), "concerns about injuries" (U = 4462, *ns*, z = -0.06), "confidence with dealing with ski injuries" (U = 3962, *ns*, z = -1.41) and "the fear of legal action is a consideration when organising ski trips" (U = 3773, *ns*, z = -1.65).



Figure 5.14 Respondents views towards school ski trips (n = 270)

### 5.4 Discussion

The main findings from this quantitative survey study suggested that schools across England and Wales are generally consistent in their approach in the preparation for and during a school ski trip. Secondly, it was apparent that there was a lack of specific physical preparation being undertaken in schools across the data set. For risk of injury to be reduced it is essential to identify if safe practices are being implemented across schools in England and Wales to ensure young people are adequately prepared for skiing. Responses from this quantitative survey study will now be discussed and set against current safety information to formulate conclusions about the preparation of young people for school ski trips.

### 5.4.1 Pupil numbers

Within any school off site visit it is vital to ensure that there are adequate staff to pupil ratios to provide the supervision needed (RoSPA 2012). Across England and Wales, this quantitative survey study found the average staff to pupil ratios during a school ski trip were one adult to seven to nine pupils. These results adhere to national guidelines which suggest with visits abroad there should be one adult to ten pupils (RoSPA 2012). However, guidelines suggest with higher risk activities these ratios should be less at around one adult to five pupils or lower (RoSPA 2012). The results collected from this quantitative survey study did not identify if these ratios were from day one of the visit and if these ratios change during on piste time when ski instructors are present supervising young people. It was not clear whether staff stay with the ski instructor during the skiing day which would increase staff to pupil ratios on the piste. The ratio of adult to pupils could be different when instructing groups of beginners, intermediates and advanced skiers when pupils are split into their respective ability groups. These are key considerations as beginners may need a higher staff to pupil ratio for increased guidance.

Both year seven and sixth form years are not as frequently involved in ski trips compared to school years eight to eleven which is comparable to data presented from the School Travel Forum survey in relation to ski trips in UK schools (STF 2014). From this quantitative survey study it was not shown why this is occurring, although ski trips can take a long duration to plan. In two national reports, it was identified in 64% (n = 130; QA Research 2008) and 71% (n = 119; QA Research 2012) of the responses, that overnight and residential trips typically take at least nine months to plan. This suggests plans for ski trips take place before the new set of year sevens have joined or have just joined the school. With the introduction of separate sixth form colleges this has led to a large proportion of secondary schools no longer having an integral sixth form. This reason could explain why sixth form years are not included in ski trips within this quantitative survey study. Within year eleven and sixth form years, exams are important for pupils and school accountability (Keddie 2014), therefore, teachers and pupils could be under pressure to fulfil exam requirements. In consideration of these results it would be appropriate to ensure that the correct staff to pupil ratios are maintained throughout the ski trip and establish if these ratios change during the ski experience.

## 5.4.2 FIS safety code

In the preparation for a ski trip, this quantitative survey study established that young people and parents were informed about different topics which contributes to reducing risk of injury. One of these central messages is the FIS safety code, which is important for all snow sports users to be familiar with and may be a method of reducing risk inducing situations (Hildebrandt et al. 2011). Whilst at the ski resort, a large proportion of respondents (85%) briefed young people about the FIS safety code. Overall 98% of respondents reported that they informed young people either prior to or during the ski trip about the FIS safety code.

The results of this quantitative survey study suggest teachers communicated the correct messages about ski safety to the pupils either prior to or at the ski resort. Unfortunately, this may be an ineffective method to disseminate safety information as it has been previously reported that young people do not listen to school teachers regarding ski safety (Macnab, Cadman and Greenlaw 1998b). Teachers have commonly perceived that young people seek risks and will still engage in unsafe activities even if safety guidelines have been communicated to reduce risk of injury (Rothe 2009). Teachers have believed by putting too much emphasis on safety, young people will lose interest and excitement in the activity (Rothe 2009). It would therefore seem appropriate for future studies to evaluate if young people retain the FIS safety rules communicated by teachers. This could be best achieved by conducting a RCT to assess whether the FIS safety rules are retained compared to a control intervention, using the skier knowledge inventory questionnaire designed by Macnab, Cadman and Greenlaw (1998b). This information would help to inform school teachers about a method that could be used to effectively transfer information on the FIS safety rules to pupils and the importance young people feel these rules are to their own and others safety. Furthermore, in addition to knowledge and retention of this knowledge, young people need to be able to implement this whilst skiing.

The FIS safety code is in place to help protect everyone on the piste and anyone who lacks this knowledge could be in danger of putting themselves and others at risk (section 3.5.10). In conclusion young people are being communicated to about the FIS safety code, although it is unknown how teachers communicate these messages and whether ski instructors are involved in the process. It may be appropriate for a standard process to be in place to ensure all the correct messages are disseminated. These messages should then be reinforced whilst on the piste by the ski instructors.

#### 5.4.3 Risk taking behaviour

Prior to the ski trip, respondents in this quantitative survey study most commonly enforce the standards of behaviour expected to both parents and young people prior to the ski trip. Behaviour has been linked to increasing risk of injuries (Hébert-Losier and Holmberg 2013) especially in the young, who have been associated with risk taking behaviours (Ruedl et al. 2010b). Dangerous behaviours such as excessive speed and skiing beyond their technical abilities can increase risk of injury to the young person (Corra et al. 2004). Despite appropriate behaviour being enforced it was not ascertained what is communicated to both parents and pupils in this quantitative survey study concerning the behaviour expected and how this will be monitored over the duration of the ski trip. For young people to behave safely on the piste it is imperative for them to be aware of their own behaviour (Verhagen, van Stralen and van Mechelen 2010) and understand how unsafe behaviour may lead to increased risk of injury for themselves or others.

School ski trips allow young people from across the age groups to come together, similar to the vertical tutoring system which is implemented in many schools across the UK. Vertical tutoring is intended to improve relationships between years and reduce bullying (Ellis 2011). Young people are often attracted by the gratification of their peers and elders (Le Breton 2004) which could affect risk taking behaviours, across and within the age groups. The awareness of danger often eludes young people in an effort to prove that they can do something to raise their self-esteem or to be accepted by their peers (Le Breton 2004). Risk taking in young people is more likely to occur in the presence of peers and is not necessarily driven through peer pressure (Chein et al. 2011). During adolescence the social environment, particularly the influence of peers, can impact on risk taking behaviours (Fuhrmann, Knoll and Blakemore 2015). Within the adolescent brain the prefrontal cortex, which is responsible for higher cognitive abilities which includes the control of behaviour, undergoes decreases in gray matter volume (Burnett and Blakemore 2009). This change in gray matter would be expected to result in more finely tuned neural circuits, thereby responding more optimally to a task (Burnett and Blakemore 2009). Although, the executive functions which influence the control over behaviour are still maturing during this stage of development (Burnett and Blakemore 2009). The increased freedom given to young people to become more independent, with less time being supervised and young people being encouraged to make their own decisions, enable risk taking behaviours (Blakemore 2018). Additionally, sensation seeking during adolescence is a contributor to risk taking behaviours during this time frame (Blakemore, Burnett and Dahl 2010). It is important to understand if risk of injury can be curtailed by young people staying in their respective ability and/or age group and monitored by the ski instructors throughout the day.

Behavioural approaches such as instructional ski videos have been successful at modifying the risk of injury (Jørgensen et al. 1998). More recently a RCT study using a video to educate school pupils (aged 11-12 years) on the FIS code of conduct, helmet use, appropriate clothing attire, trail sign interpretation and procedures in the event of an injury was effective at increasing pupil knowledge, attitudes and behaviours compared to the control intervention (Cusimano et al. 2013) (section 3.5.10). Subjectively, teachers reported that the video was well-suited to a classroom setting, was an appropriate length of time (20 minutes) and caught the pupil's attention (Cusimano et al. 2013). The video from Cusimano et al. (2013) study was developed by the ThinkFirst Foundation of Canada in conjunction with ski experts, patrollers, athletes and physicians. This may be an effective way to transfer knowledge to young people about skiing safety especially as it has been previously mentioned that young people may not listen to teachers (section 5.4.2).

Despite the benefits of educational videos, these were the least used in this quantitative survey study to provide information for both parents and young people (Table 4.1). In nearly 60% of respondents these videos were neither shown prior to or at the ski resort. Educational training videos have been used to teach skiers how to fall in an effort to reduce the incidence of anterior cruciate ligament injuries (Ettlinger, Johnson and Shealy 1995). An intervention study which included 20 ski areas who had a video training intervention was

compared against 22 ski areas where staff were not exposed to the training intervention, resulted in a 62% decline in serious knee sprains compared to the previous two seasons (Ettlinger, Johnson and Shealy 1995). The results from these aforementioned studies should be used with caution and cannot be generalised to all populations since Ettlinger, Johnson and Shealy (1995) targeted adult populations and Cusimano et al. (2013) did not identify the level of skiers. Overall, the positive effects of using educational videos seen in these studies could provide similar knowledge transfer to help with the reduction of risk on school ski trips. Additionally, if videos used role models to inform young people of safety information there would potentially be a suitable means of ensuring all schools are giving out identical information. It would be appropriate for additional evidence to be collated on the use of these measures with young people to identify what content should be included on the educational video.

## 5.4.4 Environment

Skiing can take place in a variety of weather conditions where the environment can change rapidly (Kelsall and Finch 1999). Therefore, adequate clothing and sun protection should be considered prior to the ski trip to ensure the young person is able to adapt to changes in weather conditions (Kelsall and Finch 1999). Appropriate attire should be worn to protect from the cold when stationary or using ski lifts yet reduce overheating when moving.

Prior to the ski trip, in this quantitative survey study schools across England and Wales informed both parents and young people on types of clothing necessary and sun protection needed for skiing (Table 5.1). Respondents reported to have ski clothing companies attend the information session to give supplementary advice to parents and young people. This quantitative survey study did not ascertain what information these companies provided to parents and young people. External companies will have a role to sell or rent their products to the parents and young people which could influence the information being given.

Encouragingly, teachers were informing both parents and young people to use suitable sun protection in over 97% of cases prior to the ski trip (Table 5.1). However, it is not known what was being communicated to parents and young people with regards to the importance of keeping covered up, how often to apply the sunscreen and the level of factor which should be used. Within a RCT study recording sun protection use, a significant increase in the use of sunscreen was reported when resorts were targeted with promoting the use of sun protection (Walkosz et al. 2007) (section 3.5.11). The resorts used a variety of methods such as posters and brochures to transfer messages across to parents and young people and was successful in educating young people to wear sunscreen (Walkosz et al. 2007). Although it should be acknowledged that it was the parents that were interviewed, which does not correspond to young people adopting these messages whilst on the piste. It is unknown if young people are listening to the advice of teachers in using sun protection. Ski resort instructors could have a role in ensuring young people are being given guidance and time to apply sun protection during the ski day.

## 5.4.5 Ski equipment

Ski equipment has been an important factor for risk reduction with significant changes occurring in the technology of the skis and bindings (section 3.5.1). Equipment-based information (use of ski equipment, how to safely walk in ski boots and the safe use of ski lifts in Table 5.1) was communicated more often whilst at the ski resort and it is speculated that resort ski instructors were communicating this information to young people whilst on the piste. Principally ski equipment should be in good working order and bindings set to appropriate levels for each individual skier (Scanlan et al. 2001; Whelan 1996). Ski rental outlets have a responsibility that all equipment hired is in good working order and fitted correctly to each skier.

Ski lifts come in all shapes and sizes from drag lifts to gondolas and a considerable amount of time is spent using ski lifts to ferry the skier back up the

mountain. Understanding how to use them safely is a priority since lift injuries arise during the loading phase, unloading phase and whilst being towed on the ski lift. In Scotland, during the 1993 to 2002 seasons, lift related injuries contributed to 6-8% of injuries (Langran, Jachacy and MacNeill 1996; Langran and Selvaraj 2004) which highlights the importance of correct instruction being given to ensure young people use ski lifts safely.

Helmets are another equipment factor which could mitigate against injuries to the head. Helmets have been one of the most researched equipment factors for injury reduction (section 3.5.2). However, the evidence for preventing serious injuries when wearing a helmet is often contradictory (Hansom and Sutherland 2010). Helmet use can reduce the risk of head injuries, especially in beginners where minor injuries are possible from falling over in the snow (Russell, Christie and Hagel 2010). There are a few areas within Europe that have legislation regarding young people wearing helmets such as Italy, Norway and Austria, with some resorts in North America carrying financial penalties if helmets are not worn (Alsop et al. 2013). Most secondary schools in this quantitative survey study expect young skiers to wear helmets (97%) which is a positive stance enforced by schools. In addition, insurance companies are now recognising the importance of helmets and not wearing a helmet could invalidate the insurance if injured (Berg, Eiken and Tesch 1995; Langran and Selvaraj 2002).

In summary, ski equipment is not only the responsibility of the ski rental outlets to ensure ski equipment is in good working order, but the responsibility of ski instructors and teachers to provide young people with the information to use the equipment safely. In addition, compliance from the young person is essential to use equipment in a responsible manner.

### 5.4.6 Activity levels

School ski trips were identified in this quantitative survey study being typically over a week long with pupils spending around 4-5 hours a day on the piste. Consequently, when on a school trip, pupils are considered to be far more active than accustomed to in a normal school week (section 3.5.6). Young people are recommended to engage in MVPA for at least 60 minutes per day (Department of Health 2011) which does not always occur in many young people across the population (Dunsmith et al. 2011) (section 3.5.6). A meta-analysis presented that the mean time secondary school pupils spent in MVPA during PE lessons was 40.5% (Hollis et al. 2017). To ensure young people are meeting recommended guidelines would require additional PA at a level to meet MVPA.

Being on the piste for this length of time does not necessarily mean they are engaging in MVPA throughout the 4-5 hours. Activity on the piste will range from sedentary to light intensity (e.g., sitting to eat lunch, sitting on the chair lift) to MVPA (e.g., controlling decent down the piste). To identify the amount of time pupils engage in MVPA during a ski trip will need investigation as at present this is unknown. This information would be relevant in understanding the proportion of the time pupils are at MVPA on the piste. This would require researching different groups of pupils (beginner to advanced) using different objective methods (accelerometery, HR monitors) to analyse the frequency, intensity and duration spent at different levels of PA whilst on a ski trip.

There may be an imbalance between a young person's physical fitness level and the physical demand needed during the school ski trip (Carter and Micheli 2011). Evidence suggests a lack of physical fitness is significantly associated with an increased risk of sports injury within young people (Carter and Micheli 2011), this risk is then going to be exacerbated in skiing in which the young person is needed to be physically active during 4-5 hours of the day consecutively throughout the ski week.

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Results from this quantitative survey study suggest young people are on the piste for long durations but structured breaks are incorporated into the ski day to allow young people to rest, consume food and hydrate. The methods utilised to decide when and for how long a group needs to rest are unknown. The ski day does not involve the young person to be active continuously throughout the day as skiing involves natural periods of rest when the ski instructor is teaching techniques and whilst using the ski lifts (Seifert, Kröll and Müller 2009). This is not rest in the true sense of the meaning as when standing on the piste isometric muscle contractions are taking place to keep the skier upright in a ski boot; this constricts the young person's leg in an unnatural position (Böhm and Senner 2008). Furthermore, the skier will be resisting against sliding down the inclination of the piste. When using a ski lift which requires the skier to stand (button or T-bar lift) a skier will have to maintain an isometric position, whilst also holding onto the lift as they are pulled up the slope. This may be especially relevant to beginners who will not be traversing across steep inclines and therefore smaller ski lifts such as button lifts may be more frequently used.

In summary, even though young people are out on the piste for long periods of the day, natural breaks due to ski instruction and structured breaks are incorporated throughout the ski day. Young people are briefed about recognising when they need to rest both prior to and during the ski trip. However, it was not clear what information on the effects and signs of fatigue are given to the pupils or how this was monitored during the trip. Only a small number of respondents incorporated a structured break because of fatigue, which could be an important factor due to fatigue influencing motor control during skiing (Ferguson 2009). Low frequency fatigue can manifest over a few days of skiing and can be seen to be a greater issue in recreational skiers (Ferguson 2009). As previously mentioned, skiing predominantly uses eccentric muscle contractions (section 3.5.8) and low frequency fatigue has been shown to be more pronounced after eccentric muscle actions (Rijkelijkhuizen et al. 2003). In addition, the fast glycolytic portion of the muscle was more susceptible to low frequency fatigue than the fast oxidative muscle parts (Rijkelijkhuizen et al. 2003). This is significant to recreational skiers who were found to have a greater utilisation of fast twitch (fatigable) muscle fibres over one day skiing

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compared to well-trained skiers (Tesch et al. 1978). Therefore, it may be appropriate to ensure all young people are prepared to cope with the demands of skiing with the implementation of ski specific exercises, although there are no known evidence-based guidelines (section 3.5.7). Additionally, ensuring there are mandatory breaks occurring during the ski day helps to offset fatigue since this is not always perceived by the skier (section 3.5.8).

## 5.4.7 Nutrition and hydration

During exercise, daily water needs can increase which can be affected by the environmental conditions, individual sweat rates, exercise time and intensity (Committee on Nutrition and the Council on Sports Medicine and Fitness 2011). Remaining adequately hydrated seemed to be important to respondents in this quantitative survey study as over 80% mentioned this to parents and young people prior to and at the ski resort (Table 5.1). The availability of fluids on the piste can be problematic and fluid changes do occur especially when skiers typically ski two to three hours before consuming fluids (Seifert et al. 2006). Changes in fluid balance can cause physiological changes which may affect skiing performance and safety (Seifert et al. 2006). A large majority of pupils in this quantitative survey study tend to carry their own water, drinks or snacks whilst on the piste. Frequent water ingestion throughout the ski day has been shown to maintain hydration (Seifert et al. 2006) which should be communicated to young skiers to ensure they are adequately hydrated throughout the ski day (section 3.5.9).

Alcohol consumption is another important consideration given it is illegal in this age group (Kelsall and Finch 1999). Alcohol consumption was mentioned prior to the school trip in over 90% of cases to both parents and young people in this quantitative survey study. This is important to consider due to the age of pupil attending the trip and the influence of alcohol effecting judgement and hydration during skiing (Corra et al. 2004). Whilst on the piste ski instructors are able to

monitor what young people are drinking, conversely if pupils are able to ski by themselves the reality of this is unknown.

Alongside hydration, appropriate nutrition is important to consider, stabilising blood sugar levels whilst on the piste. Nutritional workshops have been implemented for ski patrollers to increase knowledge on what foods should be eaten to stabilise blood sugar (Roberts 2013). This intervention taught ski patrollers to eat small frequent meals that consisted of complex carbohydrate and lean protein (Roberts 2013). Education of appropriate snacks to be consumed would need to be disseminated to parents and young people. The communication of nutritional advice to both parents and young people was not identified in this quantitative survey study. As highlighted in section 5.3.4, breaks are taken throughout the day whereby young people can use this time to refuel and hydrate. It would be crucial to recognise if young people are given adequate nutrition whilst on the piste and if differences exist between school groups, for example those who can afford a hot meal to those who cannot afford a hot meal and have packed lunches.

# 5.4.8 Teacher and instructor guidance

Previous research has indicated that first day skiers and young skiers are at an increased risk of injury (Langran and Selvaraj 2004). Consequently, it is recommended that those who are new to skiing or inexperienced should be enrolled in lessons to teach them appropriate techniques (Goulet et al. 1999). A review of ski injuries in young people suggests one of the many reasons for injury could be due to inexperience (Meyers et al. 2007). In this quantitative survey study, 25% of respondent's ensured young people had ski lessons prior to the ski trip to reduce the risk of injury and increase enjoyment whilst out on the piste. Ski tuition is enforced in most schools during the ski trips but 12% of respondents did not have a ski instructor stay with the group for the entire time. Some young people could ski without an instructor's guidance as they were at a suitable level to ski on their own or they had been separated from the group.

Skiers who are able to ski independently may be engaging in risky behaviours and increase risk of injury to themselves or others around them. In contrast, Macnab and Cadman (1996) identified that young people skiing during school organised activities had a higher rate of injury incidence requiring medical treatment compared to young people skiing independently. This study did not report whether young people were with ski instructors at the time of injury and what the school activities included. Formal instruction with the use of ski schools is encouraged to improve skill level, allow young people to acquire proper safety habits and ensure they are supervised by qualified instructors (Meyers et al. 2007). Further investigation into whether young people should be able to ski independently would enable recommendations into what stage they are able to ski unsupervised, such as at the end of a ski week, if they had acquired a minimal level of ski competency or shown they are able to be trusted on the piste.

For high risk activities like skiing, ROSPA (2012) suggest that the party leader should be a competent and qualified skier with a recognised certificate or award. In this quantitative survey study, of the 24% of teachers who had taken pupils skiing without a resort instructor, 83% of these had obtained the ASCL award which allows users to supervise skiers that they know (Snowsport England 2020). In contrast the rest of the respondents did not have any qualifications when taking young people skiing without a resort instructor. As previously mentioned in section 3.5.12 the ASCL does not allow those with this award to teach or instruct on the piste. Consequently, those with this award may be more suited to lead pupils who are competent skiers compared to supervising beginner skiers.

## 5.4.9 Physical preparation

Skiing is a challenging activity in which young people ought to be physically fit and mentally prepared to take part (RoSPA 2012). Even though physical fitness is encouraged before undergoing a ski trip, it remains unclear what the optimal exercises are to participate in for the preparation of a ski trip (Hébert-Losier and Holmberg 2013). There is a large diversity of young people attending school trips, therefore it is difficult to organise individualised programmes because training programmes would then have to target a range of biomechanical variables to accommodate the variations in individuals who attend school ski trips.

Under half of schools in this quantitative survey study provided young people with exercise programmes even though this is recommended by previous research (Hunter 1999; Laskowski 1999; Morrissey et al. 1987). Physical education teachers and general teachers were the ones responsible for implementing these programmes in this quantitative survey study. Training programmes that are implemented by inadequately trained staff may result in substandard instruction and consequently reduce the effectiveness of the training programme (Pfile et al. 2013).

The respondents in this quantitative survey study who required young people to take part in physical preparation, provided exercises for young people to complete through the application of exercise sheets to do in their own time or provided circuit-based sessions. Young people who are not being supervised may not complete the exercises at all and the exercises might be performed with poor movement quality. Within this quantitative survey study it was difficult to ascertain where and how such programmes were developed. It is advocated that interventions to reduce risk of injury use evidence-based recommendations and these recommendations may have to come from evidence from other sports since there is a distinct lack of evidence within skiing (Hébert-Losier and Holmberg 2013).

This quantitative survey study did not establish what the physical preparation was aiming to achieve, for instances what attributes of physical fitness were to be improved (Caspersen, Powell and Christenson 1985). Additionally, it was not determined if young people were screened prior to and after the exercise intervention to evaluate if improvements had been made. This can be difficult to do within schools because of lack of equipment to test, paucity of time and

staff expertise. Screening tools such as the Functional Movement Screen, a validated tool to assess movement competence, has been used to screen for asymmetries and poor movement patterns (Cook, Burton and Hoogenboom 2006) which is an inexpensive tool to use, although a lack of time and expertise may inhibit the use of such screening tools. Future research should look to identify what conditioning takes place, how often, the level of supervision and if this reduces risk of injury on the piste.

### 5.4.10 Teacher views

Despite young people being the most commonly injured population in skiing (section 3.5.3), documentation of the incidence of injuries in young people is particularly difficult to obtain (Meyers et al. 2007). Within this quantitative survey study over half of injuries were not reported to the local authority. Davidson (2004) believes that there is no method of sharing faults and problems concerning injuries occurring within outdoor education. When incidents do transpire, they are often investigated internally to avoid negative publicity and to avoid possible legal action (Davidson 2004). Without this shared information other schools cannot benefit by modifying processes and behaviour which may help to minimise injury risk.

In this quantitative survey study half of respondents agreed that the fear of legal action was a consideration when organising ski trips. The teachers in this quantitative survey study were already organising and running ski trips therefore, it would be important to know how many teachers across the UK are not prepared to organise ski trips due to the fear of litigation. These factors are potential barriers affecting the implementation of adventure trips such as the ski trip. Teachers are advised from the largest teachers' union (NASUWT) to consider very carefully about undertaking school trips which are non-contractual (NASUWT 2019). However, the House of Commons (2005) report suggests that the DfES should ensure teachers do not feel vulnerable to litigation and that the NASUWT should review its advice on its members
participating in school trips. This does not appear common practice since teachers within this quantitative survey study report feeling vulnerable about litigation.

Over half of respondents in this quantitative survey study had concerns about injuries during the ski trip which is of importance since this is the common population injured (section 3.5.3). However, encouragingly most of the respondents felt confident with dealing with injuries if they did arise. Which could imply teachers have the resources to deal with these injuries or injuries are not that significant in nature.

Young people are associated with risky skiing behaviours (section 3.5.10) although most respondents in this quantitative survey study did not have concerns about pupil behaviour during the ski trip. This may be due to teachers monitoring behaviour prior to and whilst on the school trip and ensuring young people know what is expected of them when on the trip. Cusimano et al. (2013) suggested educating the young person could help to reduce risk taking behaviour which teachers may be doing prior to the trip.

There is substantial support for school trips, especially the ski trip for pupils learning outside the classroom (section 2.4. and 2.5). This is echoed in this quantitative survey study where there was collaborative agreement that school ski trips are a valuable educational activity with respondents largely agreeing that they would like to organise ski trips more regularly. The respondents within this study already organise school ski trips and it would therefore be beneficial to understand what other teachers and schools feel about school ski trips.

## 5.5 Limitations

There are of course some limitations of the current quantitative survey study. As no pre-existing survey examining this topic was available, a bespoke survey was created as part of this thesis. This was piloted with staff at the University to test functionality and to ensure the survey addressed the aims of the study (section 5.2.7). However, construct validity of the survey could have been enhanced by being tested with the intended users prior to administration through the comparison of answers given in the survey to answers given in a face to face interview (Singh et al. 2012). Using this method to test construct validity would have addressed if the users interpreted the questions in the same way as the researcher (Singh et al. 2012).

The survey was sent to a wide geographical area to ensure the respondents reflected the survey population and to provide a large data set (Kelley et al. 2003). Less than 20% response rate is typical in this method of survey (Kelley et al. 2003) which was reflected with the 10% response rate within this quantitative survey study. This could have been influenced by the initial data collection method which used the schools web directory (Deepspace Web Services Ltd 2013) to search for secondary school websites. The web directory did not always have correct web links to secondary schools' sites or the link did not work. In addition, schools often used an online form for contact purposes which reduces spam emails, therefore these schools were not contacted through this process if alternative email addresses were not given. Some emails were blocked due to the email being unrecognised as a valid sender or being unable to be delivered to the host. Despite efforts to contact the teacher involved in organising the ski trip directly, this was found to be a time-consuming process. Subsequently, emails were sent to the school's head office and addressed to the lead ski organiser; which unfortunately means these emails may not have always been passed onto the relevant person within the school. With no previous contact with each potential respondent may have reduced the likelihood of the survey being completed. The researcher had no way of knowing which schools coordinate ski trips and therefore emails were sent to schools which may not undertake ski trips. The survey could have captured the reasons why certain schools do not organise ski trips to identify if there are any barriers facilitating ski trips.

The time of year the survey was launched was just before the school holiday period which could have influenced the response rate and may not be the time of year when teachers are actively thinking about ski trips. The completion of the survey answers given by the teachers could be distorted by social desirability bias (Krumpal 2013). This is where individuals present themselves in the most favourable manner relative to social norms and can affect the validity of the survey (King and Bruner 2000). In order to limit this bias, the survey was sent out and self-completed electronically over the web. The survey was also anonymised so that it could not be associated to any particular school which maximises participant anonymity and helps to control for social disability bias (King and Bruner 2000).

The response rate of the survey could have been influenced by the wording of the invitation letter. The initial email (Appendix seven) inviting participants to take part included information on injuries which could have influenced their decision to respond if the respondents felt the survey was exploring injuries. The subsequent email (Appendix eight) did not contain information about injuries and the response rate increased.

## 5.6 Conclusions

The results of this exploratory investigation have drawn together current practices of ski trip preparation in secondary schools across England and Wales. The current study was influential in providing direction for the second study (Chapter six). Firstly, the current study confirmed that teachers appear consistent across England and Wales with the information shared with parents prior to the ski trip. Secondly, it established that the management of the ski trip was similar across the regions prior to departing and whilst at the ski resort. It is unknown why there was varied practice of implementing physical preparation and ski lessons prior to the ski trip. Therefore, interviews would be necessary to develop a richer content of the intimate details of the knowledge transferred to young people and the processes for the management of school ski trips, since there are no mandatory guidelines for teachers. These processes will be further explored and reported in the following chapter.

Chapter 6: Exploring the preparation practices of school ski trips through the voice of teachers: The qualitative interview study

### 6.1 Introduction

School trips involve travel outside the normal classroom environment and require a high duty of care to ensure the wellbeing of the young person (Hunter-Jones and Hunter-Jones 2007). The success of a school trip is often dependent on a teacher's prior knowledge of the excursion (Anderson, Kisiel and Storksdieck 2006), in conjunction with the goodwill of teachers to organise and facilitate such trips (Hunter-Jones and Hunter-Jones 2007). It has been suggested teachers organise school trips to complement and enhance their students' understanding of the world, which cannot be obtained solely from within a classroom environment (Anderson, Kisiel and Storksdieck 2006). Similarly, teachers within this thesis (section 5.3.5) identified that school ski trips are a valuable educational activity. Despite their potential, when it comes to organising ski trips, there are several barriers that teachers have reported (DeWitt and Storksdieck 2008; Michie 1998). One commonly encountered constraint with organising school trips was cost (Anderson, Kisiel and Storksdieck 2006). Cost can have implications on the location and timing of the trip within the school year and effect whether parents are able to afford to send their child on the trip. Logistical barriers, such as filling out appropriate paperwork and arranging parental consent, can all additionally impact on the desire of the teacher to arrange such trips (DeWitt and Storksdieck 2008). Nevertheless, teachers could be more appropriately assisted with these tasks with the use of web-based resources, the use of administrative staff and from suitable training providers (DeWitt and Storksdieck 2008).

To the researcher's knowledge, outside of this thesis, there is no known published research on the preparation practices of teachers organising school ski trips. The findings from Chapter five provided an overall view of the practices of teachers across England and Wales. Whilst this was useful to provide initial scoping of the area, the findings did not provide an insight into the reflective experiences of teachers preparing young people for a ski trip. Neither did the findings identify the processes and obstacles encountered throughout the organisational process. In contrast, this chapter focuses on qualitative methods using semi structured interviews to collate shared practices of teachers organising ski trips. The aim of this qualitative interview study was to develop and enhance the findings from Chapter five by achieving the research objective, to collate the reflective experiences of teachers in the processes around school ski trips (section 1.4), the findings of which will support best practice guidelines for future school ski trips.

## 6.2 Method

### 6.2.1 Ethics and Governance

As described in section 4.15, ethics approval was obtained prior to data collection through research governance set according to Coventry University (Appendix two). Informed consent was obtained before proceeding with the telephone interviews through postal or email correspondence (section 4.15).

## 6.2.2 Sampling

Convenient purposive sampling was employed to select the participants for this study as it allowed the researcher deliberate choice of the sample due to the qualities the participant possessed (Ritchie et al. 2003; Teddlie and Yu 2007; Tongco 2007). To obtain further information elicited from the survey sample (Chapter five), the same participants were invited to take part. From the 270 completed surveys, 64% (n = 172) of participants who consented to further

communication had included an email address at the end of the survey. These email addresses were collated and alphabetically sorted into Microsoft Excel. Emails were sent sequentially to all email address obtained.

The email sent to the ski trip organisers contained an attached letter providing all information regarding the second study of the project (Appendix nine). The letter detailed the aims of the interview, the structure and format of the interview, the voluntary nature of their participation and informed them that interviews would be recorded. The email contained additional attachments including a participant information sheet (Appendix four) and informed consent form. When consent forms (n = 20) were returned, the researcher replied to set up a date and time for the interview (Figure 6.1). As detailed in the invitation letter (Appendix nine) an outline of the interview schedule was inculded which specified that the interview questions would contain information on the reasons for volunteering to organise the school trip, what support they receive to prepare pupils for school ski trips and what information or advice is given to pupils to prepare them for a school ski trip.

The sample size achieved was 7% (n = 20) of the initially surveyed respondents (n = 270) and 12% from the 172 respondents that left an email address. Respondents' geographical locations were five North England, six South England, seven Midlands and two from Wales. Fifteen were from state schools and five from private schools. A larger proportion of males (n = 17) than females (n = 3) took part within the interviews, this representation was unknown in the survey. Once the interviews had been transcribed (see Figure 6.1 for timeline) they were then thematically analysed. At 14 interviews it was felt that saturation had been reached whereby the same themes were arising within the interviews (Francis et al. 2010), with previous research indicating that 12 interviews will suffice in gaining data saturation (Guest, Bunce and Johnson 2006). All 20 interviews that took place were analysed which ensured the dataset had become redundant and no new themes were added (Marshall et al. 2013). Since 20 interviews had been conducted it was considered unethical to not analyse all the data from the interviews.



Figure 6.1 Timeline for interview and transcription process

#### 6.2.3 Pilot interviews

A dictaphone (Olympus VN-8500PC, digital voice recorder, Tokyo) and a telephone recording connector (Re-Tell 157, UK) was used and tested on several occasions to ensure both devices worked and that the voices were audible to allow unhampered transcription. A number of practice interviews were completed with an internal expert and an external advisor who was familiar with ski trips. The aim of this was to develop researcher confidence and allow for the refinement of questions (Creswell 2007; Turner 2010). The practice interviews guided the structured flow of questions and development of an interview schedule (Appendix ten).

### 6.2.4 Main interviews

Within this stage of the data collection, interviews were used for the exploration of ski trip leaders' experience of organising school ski trips. Telephone interviews were deemed the most appropriate method to interview this group due to the participants being located across England and Wales (section 4.11). The telephone interviews were scheduled to last 15 minutes in duration. The short time period was chosen to ensure participants did not feel imposed upon as interviews occurred within participants' working hours. To ensure interviews were succinct, semi structured interviews were utilised and Chapter four (section 4.11) explains the rationale for the use of semi structured interviews.

Using semi structured interviews allowed the researcher to ensure all key points were covered with questions asked in a similar manner for each participant (Doody and Noonan 2013). Questions were asked in a logical sequence although supplementary questions could be asked as appropriate (Savin-Baden and Major 2013). An interview schedule (Appendix ten) was used for the semi-structured interview. This allowed the researcher to group themes together to have a sequence for the questions but also allowed scope to move

between questions (Ritchie et al. 2003). Questions were developed from the initial survey in Chapter five to address the research objectives (Farmer et al. 2006). The questions were worded following recommendations from Doody and Noonan (2013) wherein questions are open ended, as neutral as possible, asked one at a time and worded clearly. Savin-Baden and Major (2013) advises not to use questions that are over-empathic, manipulative, leading questions or questions that contain "why". This was to avoid leading the interviewee, distorting the data and with the latter deemed as confrontational or threatening (Savin-Baden and Major 2013).

The researcher used a private office to conduct the interviews, where no interruptions would take place. Interviewees were in private offices or communal offices. The researcher contacted the participant at a time which was mutually agreed. Before starting the recording process, an introduction took place including an explanation of the aims of the interview and reconfirmation for the interview to be recorded (Ritchie et al. 2003). During the digital recording of the interview, the participant was asked initial questions to ease them into interview (Ritchie et al. 2003). The interview was brought to a close by the researcher asking if there was anything additional the participant would like to add to the interview. This was to ensure the interviewee had not been left with any unfinished messages which had not been mentioned (Doody and Noonan 2013; Ritchie et al. 2003). After completion of each interview, recorded data were removed from the Dictaphone and stored on the University's password protected network drive.

Telephone interviews were conducted as opposed to face to face as this allowed the researcher to have greater scope in interviewing teachers across England and Wales (section 4.11). It allowed the researcher to be flexible with the timings of the interviews, as these took place during times convenient for the teachers. The flexibility of telephone interviews undoubtedly increased response rate due to the interviewer still having a form of anonymity and flexibility with the timings of the interview. When the researcher had reached 14 interviews the process of interview transcription commenced (section 6.2.5) (Figure 6.1). The remaining six interviews took place concurrently with

transcription of the earlier interviews. However, to avoid bias and influence the way subsequent interviews were conducted, a second researcher carried out the last six interviews.

# 6.2.5 Transcription

Transcription is the process of reproducing an audiotaped interview of spoken words into written text (Halcomb, Elizabeth and Davidson 2006). After completion of each interview, the digital recordings were downloaded onto a computer and the tempo slowed down for easy transcription (DSS Player Version seven, UK). The primary researcher transcribed all semi structured interviewers into Microsoft Word which gave the benefit that they had first-hand knowledge of the interview process and expertise on the interview subject (Halcomb, Elizabeth and Davidson 2006). Additionally, it allowed the researcher to fully immerse themselves within the interview (Holloway and Galvin 2017).

Within the transcription process the interviews were transcribed verbatim using the same words originally used within the audiotaped interview (Savin-Baden and Major 2013). It was important to ensure the transcript remains true to the original so that it retains the information that is needed (Braun and Clarke 2006). The transcribed interviews did not include conversational fillers, conversational affirmations by the interviewer, pauses or silences as this was not essential for thematic analysis which seeks to identify common ideas (Halcomb, Elizabeth and Davidson 2006). Following the transcription process the document was read through whilst listening to the audio data to verify accuracy (DiCicco-Bloom and Crabtree 2006). The transcription process allowed the researcher to develop a thorough understanding of the data (Braun and Clarke 2006) by immersing themselves in the interviews.

#### 6.2.6 Data Analysis

A computer assisted qualitative data analysis software (CAQDAS) was chosen (section 4.13) to support data management (DiCicco-Bloom and Crabtree 2006) and analysis (Leech and Onwuegbuzie 2011). Specifically, the CAQDAS software package enabled the researcher to manage all project information in one place, code and store analysis in nodes, visualise data to see connections and produce audit trails (Bringer, Johnston and Brackenridge 2004). This facilitated and made the administrative tasks more efficient (Welsh 2002). Within this study the data has been managed and organised using NVivo 10, qualitative software package (QSR International Pty Ltd, 2015). Using NVivo allowed the researcher to develop a dynamic audit trail of the links created within the system which aids with transparency within the findings (Bringer, Johnston and Brackenridge 2004). Transcripts were then analysed using thematic analysis following the six guidelines proposed by Braun and Clarke (2006) (Table 6.1). This ensured a methodological manner was followed throughout the analysis (Attride-Stirling 2001). Initially within phase one, the researcher immersed themselves in the data in an active way through repeated reading of the data whilst searching for patterns (Braun and Clarke 2006; Côté and Turgeon 2005). This was to ensure the researcher was familiar with the depth and breadth of content (Braun and Clarke 2006). However, the researcher had already experienced a familiarity with the interviews through the transcription process (section 6.2.5).

Phase		Process	Researcher process
1.	Familiarisation	Transcription of data	The interviews were
	of data	and checked for	transcribed by the researcher.
		accuracy.	The interviews were listened to
			alongside the transcribed
			interview to check for
			accuracy.
2.	Initial codes	Coding interesting	Codes were generated from
	generated	features of data.	the interviews (Table 6.2)
			using NVivo to store the data.
			Segments of data were coded
			by highlighting and copying
			extracts of the data into the
			identified code. Five interviews
			were coded independently for
			verification of codes.
3.	Searching for	Collating codes into	Codes were collated into
	themes	potential themes and	themes in a data driven
		gathering data relevant	method.
		to each theme.	
4.	Reviewing	Checking themes and	
	themes	generating a thematic	
		map.	
5.	Defining	Refining themes.	The themes were defined to
	themes	Generating definitions	describe the essence of each
		and names for each	theme.
		theme.	
6.	Producing the	Accurate description of	The method and analysis are
	report	the method used and	described in detail (section
		final analysis of	6.2.6).
		selected extracts.	

 Table 6.1 Phases of thematic analysis adapted from Braun and Clarke (2006)

During phase two the researcher generated the initial codes (Table 6.2). Within NVivo creating codes involved the creation of nodes (Bergin 2011). Nodes represent variables of interest to the researcher (Ishak and Bakar 2012). This process involved identifying interesting aspects within the data and, using NVivo, the researcher was able "to code data by tagging and naming selections" of text within each data item" (Braun and Clarke 2006: 19). Coding was descriptive to summarise or describe the meaning of the text (Savin-Baden and Major 2013). The coding phase was an essential stage to build a deep engagement with the data (Clarke and Braun 2013). Coding occurred by reviewing line, sentence and paragraph segments of the transcribed interviews (Bowen 2008). The size of each coded text was as long or as short as needed to ensure the whole context was understood (Miles and Humberman 1994). Within NVivo, coding stripes were used to allow the researcher to see which codes had been used within each interview and appeared in the margins of the document (Welsh 2002) (Appendix 11). Coding occurred systematically whereby each interview was coded before proceeding onto the next interview. This allowed for newly gathered data to be compared against previously assembled codes to identify if new codes needed to be generated (Bowen 2008). The creation of codes became less frequent during the final stages because data could fit into pre-existing codes (Bergin 2011).

Coding can occur through both inductive and deductive approaches (Farmer et al. 2006). Deductive coding is where the researcher draws from current theories and has preconceived ideas from these theories (Fereday and Muir-Cochrane 2006; Joffe 2012), whist inductive coding is where the researcher allows new concepts to emerge from the data (Fereday and Muir-Cochrane 2006; Joffe 2012). Thematic analysis allows for both an inductive method of analysis (Leijen et al. 2014) and a deductive analysis where codes were developed from the interview guide, reading of the interviews and discussions within the supervisory team (Farmer et al. 2006).

During coding, observation can be selective, the researcher may unintentionally code or leave out parts of the transcript (Miles and Humberman 1994). Therefore, to ensure consistency of the codes, the researcher utilised

investigator triangulation (Archibald 2015; Thurmond 2001) (section 4.12.4). A subset of interviews (n = 5, No. 1, 5, 10, 15, 20) were coded independently by a second researcher to check for verification of codes (Farmer et al. 2006) (Appendix 12). These five interviews showed approximately 73% agreement within the coding. When disagreements in coding were evident between the two researchers, this was discussed and acknowledged that the coding may fit into different themes other than the ones chosen by the primary researcher. These differences would not have changed the essence of the theme but may have been included under different themes other than the one selected by the primary researcher. When the data set had been coded this led into phase three where coded data was then sorted into potential themes.

A theme represents a patterned meaning and captures an important aspect within the data set (Braun and Clarke 2006). Subsequently, the researcher used their own judgement to determine an emerging theme, as there are no rules to determine how often a theme needs to reside within a data set before it is considered a theme (Braun and Clarke 2006). As long as the theme captured important elements in relation to the research question the theme was adopted (Braun and Clarke 2006). To ensure validity, the researcher used investigator triangulation to increase confidence in the themes that were created (Guion 2002). The themes within the data were identified through an inductive approach which aims at discovery and exploration (Bowen 2008; Johnson and Onwuegbuzie 2004). Phase three ended when all extracts of data had been coded into themes or sub-themes (Braun and Clarke 2006). At this point of theme building the researcher was able to identify if saturation had been achieved, which was evident by thematic exhaustion (Bowen 2008).

Phase four began with refining the themes and ensuring that a collection of abstracts in each theme formed a coherent pattern (Braun and Clarke 2006). Themes needed to be specific enough that they were non-repetitive but broad enough that they encapsulated the codes within it (Attride-Stirling 2001). If this did not occur, then the theme was reanalysed to see if the title of the theme was correct or if the data abstracts needed moving to other themes (Braun and Clarke 2006). The entire data set was re-read to establish if the themes capture

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the data set and to code for any additional data that could have been missed (Braun and Clarke 2006). During phase five the researcher defined each theme by outlining the scope and content of each theme (Braun and Clarke 2006).

The process is described in detail within this section which is useful when investigating an under explored area (Braun and Clarke 2006). Detailed accounts of certain themes of interest have been detailed to provide a descriptive account of participants' experiences which are representative of the research findings (Anderson 2010).

# 6.3 Findings

Using thematic analysis four main themes were identified (Table 6.2); "teacher preparation" describes what support and guidance teachers have acquired for the organisation of ski trips, "preparation prior to the trip" related to information given to pupils and parents prior to the departure, "activities and information during the trip" related to information given to the pupils and activities occurring during the trip and "benefits and barriers" related to teacher frustrations of organising school trips and benefits of ski trips. Results are presented in relation to each theme with quotes referenced for each school teacher (T1 or T2).

**Table 6.2** Key themes and codes extrapolated from interviews along with number of sources and references in each theme.

Theme	Codes	Sub code	Sources	References
Teacher	Courses	First aid, Specific ski courses	20	53
preparation	Lead organiser		10	11
	Organising other school trips		4	5
	Reasons for volunteering		11	21
	Support and guidance		19	31
	Ski companies		12	34
	Teachers experience of skiing		14	29
Preparation	Preparation	(Information session, behaviour, general	20	214
prior to the trip		information or itinerary, physical preparation, prior		
		ski lessons, safety guidelines)		
	Student numbers		11	13
	Clothing		20	33
	Organising the ski trip	Paper work	15	37
	Travel arrangements		10	11
	Pupil experience of skiing		6	16

Activities and	After ski activities	9	9
information	Lunch arrangements	11	13
during the trip	Problems encountered	6	13
	Staff numbers	12	20
	Ski instructors	11	24
	Skiing without an instructor	4	7
	Injuries reported	5	11
	Risks and reduction Fatigue	15	58
Benefits and	Frustrations	14	34
barriers	Time of year trips occur	12	19
	Cost and funding of ski trips	10	25
	Benefits of skiing	12	26

## 6.3.1 Teacher preparation

School ski trips involve meticulous planning and require staff to be on duty throughout the trip: "there is nothing easy about running a ski trip, you know actually it is a big undertaking and quite a responsibility because you have got a lot of other people's children ... there is nothing easier or simple about it, the organisation is very complex and again it needs to be very tightly controlled" (T15).

The lead organiser ought to be adequately prepared for this task. Teachers have a range of different experiences of skiing themselves before going on their first school ski trip. Nine of the teachers (T1, T3, T5, T8, T13, T15, T16, T18, T19) had previous experience of skiing when they were a pupil at school (T1, T5, T8, T13): "*I was lucky enough to go with school when I was at school*" (T8). In contrast, for five of the teachers (T14, T17, T2, T20, T4), their first experience of skiing was by attending the ski trip as a teacher. Several support staff assisting on the trip had never been skiing until the school ski trip (T15, T16). Being naive to skiing was not seen as a problem to the organisation of the trip: "because you have not skied does not mean that you could not organise the ski trip" (T20).

Eleven teachers had previous experience on school ski trips which facilitated their current organisation of the trip. Eight of these revealed that they had been attending school ski trips for a considerable number of years, ranging from 15 to 34 years (T2, T6, T7, T8, T9, T10, T14, T17).

Teachers are often responsible for arranging other residential trips whereby their experiences are transferable for the organisation of the school ski trip: "*the main thing is that I organise lots of things*" (T18). Teachers progressed into the role as the lead organiser, following experience gained when attending previous school ski trips (T2, T3, T4, T5, T6, T7, T8, T9, T10, T14, T15, T16, T17, T18, T19, T20). "*I shadowed the gentleman that ran it for two to three years before I* 

took over the leadership of it" (T8). Initially, three teachers did not have ski trips running in their school and therefore had to set everything up from the beginning (T11, T12, T13): "I think to begin with, it was a bit trial and error so like [sic] the first time I did it, I did what I thought was right and it worked really well and then I have streamlined it" (T13).

It appears teachers who have been arranging trips for a long time can never underestimate the importance of preparation and continued evaluation: "*it is a continuing process, you do not get to a point where you think I know it all and there is no problem, it is not like that, it is a continuing learning curve and you adjust what you do to make it better and better*" (T15).

To provide relevant information to teachers, specialised courses have been created but these courses are not always compulsory to attend, depending on the school's local authority (section 3.5.12). Twelve teachers (T1, T2, T3, T6, T8, T9, T10, T15, T16, T17, T19, T20) had attended formal ski training courses run by Snowsport England, which were found useful by nine of the teachers (T1, T2, T6, T8, T9, T10, T15, T19, T20): "we went to Snowsport England who provide a couple of very good courses" (T9), "invariably I try and make sure that all new staff that go with me, go and do this qualification because I think it does open the eyes to all the things that involves and all the fantastic opportunities it gives the kids and it also opens their eyes to all the things that can go wrong and all the things we have to do to try and make sure it is a successful trip" (T10).

The remaining eight who did not attend the courses appeared to recognise the potential benefits of attending. "*No, I have not been on any of them and it is* something that I have weighed up to be honest. Every time I get an email through for that, I think I want to do that, but I have never actually got around to doing it" (T4), "I will probably take them up on it at some point but I have not done so far" (T11).

Not all teachers (T5, T18) have personally done any ski training but the staff attending the ski trip had completed the formal ski training: "*the two staff that* 

come on the trip with me are trained full works [sic]. As a school we insist at least one having basic training for the trip and we have got the benefit of having two" (T18). Conversely, there were other teachers who had not been on the courses, yet had been running the ski trip for many years (T7, T13, T14): "*I have been running trips for well over 30 odd years*" (T14) and personally felt these types of courses were not useful for them to complete due to their experience of organising school ski trips: "*I am in a situation now where I think it is probably too late, even though some authorities insist you have it*" (T14). Only one teacher (T3) did not find the course relevant as they attended part way through organising the ski trip. One teacher (T1) mentioned that there is not always funding for teachers to complete these courses.

Alongside specialised courses designed specifically for teachers organising school ski trips, guidance could be obtained from the county council which produced publications on the recommendations for coordinating ski trips. Information for teachers could also be attained from helpful websites: "*local educational authority*" and from "a very useful website ... called national guidance ... and it would take you to the site of the best up-to-date information on running educational visits" (T9).

Knowledge of where to search for information appeared important to reduce the barrier of teachers feeling unaided: "the guidance very little because we hadn't done such a trip before and we didn't have good contacts with other schools, so I was a little bit on my own" (T12). Similarly, one teacher mentioned how isolation can be a challenge: "a lot of people probably do feel quite isolated when they are doing the trip" (T18). Teachers felt that having "really supportive staff that you take with you is absolutely essential, choosing your staff carefully is really important" (T20).

The tour operator chosen was a central aspect to ensure the whole process runs efficiently. Although two schools did not use a specialist tour operator and self-organised the ski trip (T12, T15). The majority of teachers acknowledged that the right tour operator facilitated the smooth running of the trip: "getting the right ski company, they make a big difference, they really do, they offered so

much support and help" (T4), "definitely do your homework on your tour operator without any question because I have been with the same one now for the third trip and I would definitely recommend them" (T18).

One teacher (T1) mentioned how he had a disastrous first trip since he was under the illusion that the tour operator would take care of everything: *"the company that we used had not paid for the bus when we got off in Canada so I had to pay for the bus initially then we did not have ski hire and so on, so I thought if this is skiing then I am not very keen" (T1).* 

The tour operators were chosen depending on, "*cost*" (T1), "*ease of use*" (T11), "*quality of the company*" (T6), "*infrastructure of company*" (T14), "*experience of company*" (T1), "*past experience*" (T1), "*help with administration*" (T11, T18), "*support that is offered*" (T4, T6), "*providing additional materials such as a video*" (T11, T14, T20), "*training courses*" (T14) and "*booklets*" (T14). However, teachers found some of the procedures that companies use problematic with the "volume of data that needed to be input into an online system" (T19).

# 6.3.2 Preparation prior to the ski trip

There was a plethora of information that young people and parents are given to ensure that the trip runs efficiently. This information was disseminated at parents' sessions and through written documents. Parent sessions consisted of presentations by the teachers, the ski hire company and videos being shown: "there is a really good DVD from Snowsport England with exactly that on it. Good practice would be to watch that DVD at a parents evening with parents and then show it again on the coach on the route out, wherever you go" (T9).

All teachers provided information on what would be occurring on the trip and what was required of the pupils whilst they were away. This is "quite a detailed booklet that contains information about the visit, information about what students should pack. It goes through everything, it goes through the journey, it goes through all the consent forms, relating to smoking and alcohol etc., etc. so it is quite a comprehensive pack" (T8). However, not all schools give out "massive booklets ... as you have no guarantee that they will look at them" (T14). The brochure can have a combined role of providing information to pupils and "they can write in it and keep a diary or log of what they do and it's a learning experience" (T6). Teachers refer both parents and pupils to sources on the internet (T15, T16, T17, T19): "so they can watch the web cameras and get excited, give them the hotel details so that they can look at the runs they have got, you can look at everything really" (T16). One teacher thought "it might be good to have something online you know. Not from a school point of view but from a central point of view, which needs to be a phone app, nowadays" (T14).

Acceptable behaviour of a young person whilst on a school trip was introduced as an important issue in section 3.5.10. Teachers examined prior school behaviour to decide if a pupil could be trusted whilst on the trip, with teachers T6, T7, T16, T17 and T20 implementing a code of conduct: *"that tells them what they have to adhere to on the trip"* (T16). Before attending the trip, pupils had their behaviour monitored: *"any significant behavioural issue in the school before we go then they are not allowed on the trip … I need to be able to trust the kids"* (T11). Teachers felt this was important as *"it is the fact that the kids are responsible for their safety in terms of how fast they go*" (T16).

The FIS safety code was covered either at the parents' session or handed out within information packs prior to the ski trip (T1, T2, T4, T5, T6, T7, T8, T9, T10, T11, T12, T14, T17, T18, T19, T20) with teachers repeating this information whilst at the resort (T1, T7, T12): "*it does not mean a great deal to them having not been on the slope, so after the first day you can then go through it*" (T1), "*you are reemphasising and checking that they are understanding that they have got it* (T18), "*it is reinforced time and again*" (T2). Four teachers (T3, T13, T15, T16) did not give information on the FIS safety code prior to the trip but provided this information whilst at the resort either themselves or relied on the ski instructors to deliver this information to the pupils: "so you hope the

instructor points that out as well' (T14). "That is what they are paid for and what they are good at and what they are qualified to do ... they then start teaching, all the different things that are important about skiing. Learning how to ski but also how to conduct yourself on the slopes and what happens if things go wrong and things like that ... it is sort of learning on the job" (T15).

Physical preparation was often stated as an important component to reduce risk of injury (section 3.5.7). Most of the teachers (n = 15) provided information for pupils on methods to physically prepare for skiing. This included guidance and advice at information sessions; "*staff doing exercises on stage*" (T10), and information sheets or booklets being provided, "*within the booklet there is a page on getting fit to ski*" (T11). However, it was not known if pupils were adequately trained to go on the ski trip. Two teachers (T10, T20) tested their pupils by giving them fitness tests: "*we were getting fed up with kids really not putting the effort in, we now give them a fitness test and is compulsory to do that … we set targets for over the summer holiday we then test them again … they are being constantly nagged about it and I must say ever since we've done it the number of injuries on each trip have gone down" (T10).* 

Teachers also mentioned how young people often feel that they are fit enough and therefore do not need to do additional exercises: "what is he talking about I am fit enough ... young people they [sic] believe that they are invincible and they are fit enough ... but what they don't realise is, to call in that old phrase it is about using muscles that you did not know you had" (T8).

Exhaustion was commented as being an occasional issue (T2, T8, T11, T18): "I have only had one girl who I had to take off the mountain through exhaustion and that was because she was extremely overweight and extremely unfit" (T2). In reality teachers did not have time to arrange ski fit clubs, they felt that extra sessions were not always needed, or young people did not attend as they were not timetabled. Two contradictory quotes about young people who attended ski trips are presented: "I think being fair to the children who normally want to go skiing, are normally fit and therefore do quite a lot of exercise above and beyond normal PE in school" (T3), "it amazes me, always amazes me the sort of kids that you get coming skiing, you get some that hate PE and yet they want to do this which is bizarre" (T13).

Prior ski lessons were a way to introduce beginners to skiing (section 3.5.5) and educate new skiers: "how to put their skies on, how to carry their skies and how to do all the basics which is great" (T2). One teacher did not take pupils on the ski trip if they could not do the basics: "we insist on them being able to snowplough and use the tow" (T19). This was enforced due to skiing costing a lot of money: "it is not the best use of your parent's money" (T19). Teachers felt that taking pupils to lessons prior to going on the ski trip could only save them time in the first morning of skiing (T10, T14) and "it is not a necessity" (T5). Thirteen of the teachers interviewed did not take their pupils to have prior ski lessons either at a dry slope or snow dome, although ten of the teachers changed practice as they used to take their pupils to have lessons. The reason for this change in practice was time (T3, T8, T11, T16) and cost (T1, T4, T8, T11, T13) implications. In contrast to teacher T19 who does not take non-skiers, teacher T3 stated: "I have let people go in the past who have never been on skies before and it hasn't affected them. To be honest if they went to MK [Milton Keynes] and had a bad experience it might put them off going, whereas actually when they are away and have a bad first day, they have just got to deal with it and get on with it ... I think there are probably more plusses than minuses, but I think it is not the end of the world' (T3). If a pupil acquired an injury whist on these simulated slopes it may be problematic and therefore impact on the pupil being able to attend the trip (T11, T15).

Appropriate clothing for skiing is required to ensure young people are protected from the elements (section 5.4.4). Teachers have a duty to inform both parents and pupils on suitable attire for the trip, especially as many of the young people have never skied before (section 5.3.4). Clothing can be another expensive outlay and one teacher T8 had brought old ski attire and helmets to loan out to young people. From the seventeen teachers who spoke about clothing companies twelve of these bring in an external company to talk about clothing required: "a local ski clothing company, they come in and just talk to the children about what they should be wearing on the mountains" (T2), "they bring a load

of stuff to show rather than me bringing all my own ski kit in" (T13). One respondent commented that due to timetabling it can be difficult to find the appropriate time for the company to come along to the information session and arrange collecting times for the clothing (T4). A more efficient company was now used which reduces the time pressure: "with this company I have dealt with, apart from bringing them in on that night I have not had to do a single thing. They do the whole lot so that they will deliver it to the house or if they do deliver it to school, they will contact the parents and kids. Not taking me out of the equation but making it easier, I think that they have seen a niche actually ... one of the biggest reasons I reckon that these companies are not brought in is because of time and they realise that ... which is really good' (T4). Conversely, five respondents spoke about not using clothing companies: "I have had the company along to that [information session] but again with being so experienced I can do that myself now" (T14). One teacher had a colleague model the ski clothing "so that the kids could see the layers that should be shed as necessary... you know monitoring their temperature that way" (T17).

As previously mentioned (section 5.4.1) having adequate staff numbers is essential to ensure sufficient cover: "we can deal with practically anything, without having to sort of compromise on our supervision ratios ... you don't want to be short of staff because all you need is two or three incidents all happening" (T15). Across England and Wales pupil numbers attending ski trips are variable, which was often attributed to affordability for the parents plus the management of the staff to pupil ratio. One respondent felt he had to keep numbers restricted: "there are many kids that say can't we go, can't we go, and just [sic] you have to keep it manageable ... but you have just got to draw a line somewhere because it becomes unmanageable if you're not careful" (T11). However, this teacher felt he would have liked to allow all pupils to attend the ski trip: "really that goes against something I would have initially liked to have done because I was lucky enough to go every year, my parents couldn't afford that much but they could afford to send me every year" (T11). There are other schools who will take any number of pupils: "my general rule for organising trips is that we will take whoever wants to go" (T5).

#### 6.3.3 Activities and information during the trip

Teachers were aware of the risk factors when taking young people on ski trips and understood it was how they handle these risks which are essential (T9, T15, T16, T18, T20): "well yes there are always risks, endless risks but it is how you manage them is the important thing" (T15), "there is massive risks skiing but it is the same as any sport" (T16), "there are hundreds of risks, oh my goodness, you would not sleep at night if you thought too much about it, but you have just got to have a very robust risk assessment, know that there are risks, of course there are, avalanches you name it, there is everything ... but I think if you really try hard to minimise risk and make them aware of the risks then hopefully you have no problems" (T18). For those pupils who were dictated by parents to attend the ski trip and were not enjoying the ski experience appeared to be more at risk: "can't be bothered and doesn't listen and does what they want, somebody who thinks that they know better than the instructor, I think that's where any risks does creep in" (T3).

Teachers (T2, T9) felt it was important to remind pupils about applying sun factor regularly, ensuring they are wearing appropriate clothing to protect them against the elements and wearing ski helmets. Teachers T1, T2, T6, T8 explained that wearing ski helmets can reduce risk of injury and staff have stipulated that they also wear helmets (T8). It was also recognised by one teacher (T1) that ski helmets would not protect the young person if they were doing excessive speeds down the piste. Two teachers (T4, T8) expressed how a young person can become overconfident in their ability which can increase their risk to injury: "they tend to get more confident and so they tend to push the boundaries that little bit more and they tend to think they are better at it then what they are and they start taking risks which they would not have done when they first started" (T4), "the day three scenario, because by day three they think they know everything about everything ... on day three as we travel to the slope I always make a point of reminding them [the pupils having lessons] not to be overconfident" (T8), "what happens is they tend to get overconfident" (T4) and teachers felt this can lead to increasing risk of injury to the pupils.

Fatigue during a ski trip can be problematic since this can increase the risk of an injury (section 3.5.8) and was identified by the teachers as a cause of risk when on a ski trip (T1, T4, T8, T15, T19). Alongside accumulated fatigue over the duration of the trip, fatigue can be initiated from the journey over to the ski resort. Two teachers remarked that the coach journey over can be a problem which can increase tiredness when out on the piste (T4, T6). Travel arrangements need careful consideration to ensure costs are kept to a minimum with coach transfers being the main source of transport to ski resorts. Although, one teacher stated they only travel by plane: "they always go on the plane they don't travel by coach because there is a risk of them being so tired when they get there, then they have accidents first day [sic]' (T6). One teacher linked fatigue back to the lack of initial physical preparation: "yes fatigue is an issue ... because going back to that fitness preparation, they don't perceive how difficult it's going to be and because it's cumulative, I mean we do five days and five hours per day so by the end of the week fatigue does set in and does add to, and can add to the risk of injury" (T8). To reduce this risk of fatigue, teachers ensure pupils go to sleep early (T4, T7, T17), and they ski slower and more controlled on the last day working more on their technical skills (T16). Taking enough staff to provide cover to take pupils out of the class if they are struggling and need a break helped to combat fatigue (T15).

Lunch time arrangements are either a packed lunch (T2, T12, T15) or a sitdown hot meal (T4, T7, T14, T16, T17, T19, T20), although this may be different depending on the resorts and tour operator (T13). One teacher, whose pupils took ruck sacs with them on the piste, due to a freak incident which occurred in another school is now not permitted to use rucksacks and if they take packed lunches these then must be "*stuffed into pockets*" (T2). Conversely, one teacher recommends that hot lunches should be opted for: "*having a hot meal means we are going to make sure that everyone goes into the restaurant, they sit down, they rest for half an hour even if they don't eat much they sit and rest and they are in the warm and I think that will make a difference to the afternoon*" (T4). After ski activities and evening entertainment was not an area explored within the semi-structured interviews. However, nine of the teachers mentioned after ski activities within the information they gave to pupils and parents (T1, T2, T3, T5, T6, T9, T10, T17, T20). Activities and entertainment are provided on trips to reduce boredom in the evening: "we will go stir crazy staying in the hotel" (T5) and so they are "not sitting about doing diddle squat, saying you know I am bored" (T17). One teacher recommended that "evening activities are very important … and they very much differ depending on what your hotel arrangements are like" (T5). Four teachers suggested that they have some sort of activities every night (T5, T9, T10, T17). The types of activities stated were "après ski" (T3, T10), "bowling", (T9) "ice skating" (T9, T17), "swimming and games night" (T17). The after ski activity appears to require consideration: "if you are having to go out every night because there is nothing on site, then obviously you need to consider what that is going to cost as well" (T5) and "there are possibilities of pupils getting drunk at the disco" (T4).

Five teachers (T2, T5, T6, T9, T10, T15) spoke about either staying with their group of pupils learning and/or travelling around the groups to check on their pupils: "*in every ski lesson there is an instructor and a member of staff with that group every single time. Well the staff do not go to ski they go to look after the children*" (T6), "*I would always encourage staff to stay with their groups to check that the ski instructors are absolutely spot on*" (T2). Additionally, one teacher (T15) felt that it was important to have enough staff to ensure adequate cover if a number of incidents occur at the same time.

## 6.3.4 Benefits and barriers

Organising ski trips does require meticulous planning and when teachers have additional barriers placed on them, this impacts on their willingness to continue organising trips. Physical education in schools are being tightly squeezed with additional pressures being placed on teachers. Core subjects are being considered first, to ensure young people are meeting grades (T8): "So whether it be dance, drama or PE or any other creative subject these get pushed to one side as we force this academic route" (T8). "If they are behind in other things then they will be taken out of core PE to catch up in their academic subjects, ... you are almost telling them [the pupils] well it is not that important ... and that is wrong in my view" (T4). The impact of this has resulted in activities, such as the ski trip, being placed out of term time (T1, T3, T4, T8, T10, T11, T12, T13, T16). Several teachers (T8, T11, T14, T16) indicated that: "we were very lucky here for a lot of years to be able to go in term time and that made a tremendous difference" (T14). However, this has changed due to "the pressures of the curriculum over the years" (T14). Therefore, school trips are being compromised as these trips are not seen as educational or as valuable as other trips (T8): "our head isn't sporty at all and does not see the value of it, he is an educationalist really, he is an academic" (T4).

Departing on trips out of term has implications on "*cost*" (T3, T4, T8, T11, T13, T14) which increases the price paid for the trip (T11). In addition, going on trips in school holidays reduces the amount of ski time because there are more people on the piste during these times and "*they are in lift queues more often*" (T11). Other consequences are that: "*potentially it is a lot more dangerous as there are more people*" (T14). Teachers witnessed more benefits when the ski trip was during term times: "*there was so many advantages not only in just cost but also the ferries are a lot quieter, the slopes are quieter, you get better instruction, there are no queues and all of those sort of things add up*" (T14), we "would be able to fly and they would get a lot better experience" (T4).

Out of term trips has had an influence on staff giving up their free time: "*it has been more difficult to get staff who are willing to give up their holiday*" (T14), "*all joking apart, teachers do need their holidays*" (T8), "*I could well imagine that teachers will give up taking trips and it will be on the decline*" (T8). Allowing teachers to lead and run ski trips in term time also has cost implications with a need to provide teacher "*cover*" (T17) although respondent T3 feels "*the savings in cost you get*" (T3) when going in term "*outweighs the cover implications*" (T3). In addition, there were several teachers that found going out of term a frustration (T3, T4, T11, T12, T14) and it was not felt disruptive by going in term time (T3). Although, respondents did understand the "*practical difficulties*" (T12) of going in term time, parents may expect to take their child out of school for a holiday and would be told "*that it was not an acceptable*"

reason and we would code it as unauthorised absence" (T3). Similarly, respondent T11 understood how the government have restricted absences: "when parents phone up and say can you authorise my kid to have a week off school and she [head teacher] says I can't, and their comeback is you let the ski trip go out for a week" (T11). This was felt to place the head teacher in an awkward situation. However, T11 suggested: "they only go in year eight and nine, so my argument back is that the fact that in terms of the curriculum it does not really have that great an impact". Another justification for not being able to have the ski trip in term time is that the head teacher "sees it as a freebee for staff" (T4). Respondents feel that attitudes to ski trips are different to any other school residential trip (T3, T4) which are "fine to do in term time" (T3).

Teachers are finding paper work has increased (T16) and this was causing frustrations (T6, T8) especially on "*time and effort*" (T8) it takes to organise. A further nuisance found was "*getting pupils to bring in the information on time*" (T16) and parents to get their paperwork back on time (T18, T19), with teachers having to send out reminders (T19) and chase up paperwork not brought back by pupils (T18). In contrast one teacher felt: "*in terms of organisation … there are no barriers at all that I can see*" (T15)

For any school trip inclusion was an important factor (section 2.3) to ensure all pupils have the same opportunities to attend school trips. However, this can be difficult to implement due to trip costs. One teacher (T17) explained that this was not possible if he were to take a pupil with "special needs" as "the region was not supplying extra funding to take along extra staff ... to come along with that pupil or student. If they are saying inclusion, then they should be funding that person going for that pupil. Otherwise that pupil cannot go because the parents cannot afford to pay for the kid ... plus this extra adult" (T17).

The potential of litigation if an accident should arise can be a barrier to any school trip (section 2.8) which was recognised as the reason why some members of staff do not organise school trips (T20): "staff are worried about the potential implication if someone should get injured or should something happen that is untoward" (T20).

As previously discussed (section 2.4), there was a huge array of benefits to young people when experiencing a ski trip. Teachers can pass on their "*interest* of skiing" (T14) and "*ultimately it is the rewards for the pupils and seeing pupils* progressing … that is a satisfaction" (T16), "I feel quite passionate about it to be honest" (T11), "I enjoy it … it is amazing" (T20), "it's fantastic, I love it, I think everybody should have the opportunity to go" (T11), "I absolutely loved it and thought it was brilliant, the best thing I had ever done it was fantastic" (T4), "I was hooked and demanded to go every year" (T10).

Teachers have expressed that pupils will get "far more from a week in the Alps than they experience in school" (T11) and it was important "to develop rounded individuals not necessarily academics" (T8): "the ski trip is tiring but is always exciting and enjoyable" (T15), "it is a life experience trip being away from home, having to stay in a room, having to look after yourself, remember things, so it is not just a ski trip, it is a whole experience for them [the pupils] being away from home as well" (T16). To truly experience the ski trip, it was important not to "wrap them in cotton wool, then they are not getting a true life experience of how exciting the sport can be" (T17).

The perceived benefits of ski trips can influence young people "getting a foreign experience" (T17), experiencing "new activities, sporting activities, challenging themselves, social situations, exposure to foreign languages, exposure to foreign currency" (T3), "getting away from their parents" (T13), "benefit to their social skills, their ability to work in a group as a team" (T4). To ensure that this was an educational experience one respondent reported their pupils "keep a diary or log of what they do and it's a learning experience. So they have to write about what they have learnt, what they have experienced and then how much French they have learnt and stuff like that … we take in the spending money and we have a bank system … so that every night staff operate a bank and the children come and learn how to budget" (T6). A geography teacher who organised the ski trip explained that he has "a vested interest … to broaden pupils' horizons and get them to learn a little more about the world" (T20).

Teachers mentioned in their interviews that they had received feedback from former pupils about their memories of their school trip as highlighted in the next extracts: "one of the highlights of their schooling was going on the ski trip" (T17), this is a "huge perk to have in the school" (T18). The impact of the ski trip can benefit the pupil in terms of confidence: "the biggest reality for me when I saw it was [when a pupil] who is completely non-sporty … he never ever excelled at any sport ever, and the confidence he gained … was unbelievable and he actually took GCSE PE because he could do skiing as part of it and he ended up with a 'B' and to me his confidence and his ability to be able to participate in sport shot up because he went on the ski trip" (T4).

## 6.3.5 Cost

The cost of the trip can be a huge financial barrier to young people and their parents. Therefore, some schools can only put these kinds of trips on "*every other year*" (T15). One respondent commented on another staff member's beliefs that the school ski trip, "*is too expensive*" (T17) to go on, however "*you get everything included, three meals a day, supervised all the time*" (T17) which is justified by the price of the trip. "*Skiing is an expensive activity*" (T15), therefore schools have to consider how to make ski trips affordable. As previously mentioned (section 2.3) the cost of the school trip was a factor which causes a major obstacle to parents being able to send their children on this type of activity: "*the cost, the cost is massively a barrier I have to work my knackers off* … *my kids are not in an affluent area at all* … *a lot of the time my kids will not even ask their parents as they don't want their parents to say no, there is no point*" (T4).

The socio-economic area of the school will have a bearing on the disposable income of the parents and if they are able to afford to send their child on school trips: "*I have got working class background families they are quite needy on the money front … a few of them are scraping the money together for the first member of the family to go abroad*" (T10), "*most of the time the kids that go are* 

the ones that the family cannot afford to go as a whole family" (T17). Teacher T11 was in a similar situation when he was a pupil, "I would never have gone because my parents could not afford to have done it and they would not have been interested in skiing either so I went on the school ski trip aged eleven and then fortunately went every year after that through all of my secondary education, so I was really lucky in that respect" (T11).

The location of the trip will also impact on cost: "money restraints are sometimes an issue with parents, so I would love to go much further afield but realistically I am not to expect that of people" (T18). "I think the recession has really hit us we only take around 40 kids these days whereas we used to do two coaches and we used to be a party of 80" (T10). Conversely, there are schools in more affluent areas which did not have problems with ensuring adequate numbers of pupils attend: "the parents are quite affluent, so I don't ever have too much trouble filling it and it has got a fantastic reputation" (T11).

The cost of school trips increases significantly out of school term and this can impact on when a trip takes place in the academic year. The balance of cost and what young people want to experience needs to be a consideration: "*I know I could go at Easter but the kids want to see snow.* You know they want to see snow everywhere, as much as anything that is part of the deal for them ... so I am trying to find the best balance of what it is that I can offer them for the right price" (T13). Going out of term was a barrier to the cost of the trip since prices increase during this period: "I worked it out that it would probably be about 150 quid cheaper going in term time but at the same time with that ... the slopes are not as nearly as busy so the kids will get more skiing in and all that sort of stuff as well so it is a bit of a balancing act" (T13).

To ensure the ski trip was transparent in terms of cost, teachers provide a full itinerary of what is included and any additional costings to parents: "*the trip is very much inclusive of everything that they need, except the clothing and a bit of spending money*" (T11). "*I tend to do a letter with all the information on, with the fully itinerary and the costings and what else they are expected to pay for* 

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ski clothing and pocket money so that they have got an idea on how much to take in total really, because it can add on 100-120 pounds on to the price" (T14).

## 6.3.6 Injuries

Within the telephone interviews, injuries were not a topic that was explored due to the difficulties in self-reporting injuries accurately and the severity of injuries sustained. However, when asked what risks they feel are present within ski trips this theme came up in multiple interviews (Table 6.2). Five of the teachers reported to have at least one injury in their group, ranging from blisters to a fracture of the spine (T1, T7, T16, T19, T20). This is represented in the following extracts: "we have had some and when I say injured, I do not mean necessarily major injuries, but it is almost inevitable that somebody is going to bang their arm, or hurt their fingers" (T20), "last time we had the worst injury we have ever had, which was a broken bone in the back ... this boy had an awkward fall and fell back onto his skis" (T19). "When you are in the hospital and you have seen six or seven other guys from the slopes in there with their various injuries you think well actually this is quite common ... we have been fortunate enough not to experience too much of that" (T1). Another school has not experienced the same volume of injuries: "I suppose that is exemplified in the safety record that we have got ... in the last five years we have had one hospital visit I think, and we take 90 kids at a time" (T16).

#### 6.4 Discussion

The purpose of this qualitative interview study was to explore teachers' experiences and processes of organising school ski trips. The findings have drawn together the various barriers and obstacles that teachers encounter, including time, curriculum pressures and cost, which all impact on their desire to arrange such trips. Nevertheless, teachers felt these constraints are overshadowed by the multifaceted benefits to young people (section 6.3.4). The

findings acknowledge teacher preparation and experience of skiing differs considerably across England and Wales however this was not seen as a barrier or defined the success of a ski trip.

# 6.4.1 Teacher preparation

Previous research has suggested teachers have little training to plan and coordinate field trips (Tal and Morag 2009). Although specialised courses such as SCO and ASCL give teachers the skills necessary to organise ski trips, within recognised ski resorts in the UK and abroad (Snowsport England 2020) (section 3.5.12). The STF survey suggests that teachers organising ski trips should be attending training such as the SCO (School Travel Forum 2014) and teachers in this qualitative interview study found these courses useful. While the SCO and ASCL courses do provide teachers with information to facilitate the processes of a school ski trip, additional costs of such courses with funding not always being available to support their development and time to commit could be barriers to attending.

Within the STF survey it was identified that teachers who were the lead organiser and subsequently resigned from the school resulted in the withdrawal of these trips, with many of these schools wanting to reintroduce ski trips in the future (School Travel Forum 2014). This is problematic when teachers who are experienced trip organisers retire or relocate to other schools when no other teachers are prepared to manage or continue the process. Staff not being suitably qualified was a common reason for schools not running ski trips (School Travel Forum 2014).

In this qualitative interview study additional sources of information for teachers were acquired from the local council, the local educational authority and the national guidance website. Teachers should be able to access evidence-based information to update their materials and ensure they are providing the most accurate information to pupils and parents. These additional resources were mentioned by only two teachers in this qualitative interview study, possibly demonstrating the dearth of information given to, or these resources not being pursued by organisers. Consequently, ski guidance should be updated and sent annually to teachers organising ski trips.

Nine of the teachers in this qualitative interview study had their first skiing experience whilst on a school ski trip when they were a pupil, whilst five were introduced to skiing as adults supporting a school ski trip. These findings suggest that the school ski trip introduces both young people and adults to skiing; many might not otherwise have the opportunity to experience skiing without these residential field trips. School ski trips should not be undervalued due to the diversity of people they introduce to this unique experience.

Sixteen of the teachers communicated about moving into the lead organiser role following their experience of shadowing colleagues organising similar trips. Teachers who are responsible for organising ski trips also organise a multitude of other school trips. Familiarity of organising residential field trips is transferable due to similar paperwork that needs to be completed, including risk assessments and consent forms.

Taking support staff was found to be essential in this qualitative interview study to ensure tasks can be shared within the team during the trip. Using specialist ski travel tour operators facilitated in the smooth, efficient organisation of the trip. To assist teachers in making an informed decision about a tour operator the STF manages applications for the award winning LOtC quality badge (School Travel Forum 2015). The STF audits companies which hold, or are applying to hold, the LOtC quality badge. This assists schools to make informed decisions to identify good quality companies which offer safe provision for school trips (School Travel Forum 2015) (section 2.8). Tour operators will range in cost and support offered and therefore teachers need to balance these attributes to ensure they are being suitably assisted. Teachers commented they remain loyal to companies who offer exceptional services and who have an infrastructure to support teachers with tasks such as completing risk assessments. Within this qualitative interview study most of the teachers use a
tour operator to arrange the school ski trip with a small number self-managing the process. Within the STF survey, regarding ski trips in the UK, 92% use ski tour operators with the remaining schools self-organising (School Travel Forum 2014). This suggests tour operators play a huge role and assist teachers with organising and running ski trips.

## 6.4.2 Preparation prior to the ski trip

Organising any residential school trip is not an easy task and requires teachers to complete paperwork and collect and send out forms to parents which is time consuming; particularly when teachers are continually updating the material. Teachers want a more efficient system around dealing with money, permission and transportation (Anderson and Zhang 2003; Michie 1998), which appears still underdeveloped.

Teachers in this qualitative interview study enforce good standards of behaviour through the implementation of codes of conduct, which is signed by parents before the trip. Behaviour is monitored before attending the school trip to ensure that teachers can trust the pupils whilst away. Similarly, prior misbehaviour in school is a consideration for not taking pupils on field trips (Michie 1998). Those attending the trip should be prepared about the expectations of their behaviour (Behrendt and Franklin 2014), to ensure they know what is expected of them. For example, having responsibility for their own safety and controlling how fast they will be travelling on the piste.

When preparing for a school trip, teachers need to consider safety issues concerning the trip and how to minimise risk by disseminating this information to parents and pupils (Behrendt and Franklin 2014). In this qualitative interview study parents and pupils received information through booklets and information sessions. Booklets are compiled by the teachers and are developed each year. Teachers have commented on the range of information which goes into these booklets with one school also including a diary section that can be filled out by the pupil to facilitate their learning experience. A method not commonly used to disseminate information was using a specifically made video. The findings from the previous chapter (section 5.3.3) emphasise that videos are not frequently used, possibly due to the videos either not being readily accessible or teachers feeling they are not worthwhile. Two teachers in this qualitative interview study mentioned the use of DVD's to inform pupils produced by Snowsport England and Interski and one organiser believed this would be a beneficial way to deliver messages on the FIS safety code. Using a video, which is developed by the leading body, could be a central way to deliver similar messages to all pupils attending the ski trip.

Information on the FIS safety code was included in documents sent out to parents/pupils or given at the information session by sixteen of the teachers. Four teachers only gave this information when at the resort by informing the pupils or through the ski instructors communicating this information. Teaching sessions on alpine safety has been effective in increasing knowledge in young people aged 11 to 12 years (Cusimano et al. 2013). Within this RCT study researchers used a video to educate pupils on the FIS safety code and awareness of changing behaviour to avoid injury (Cusimano et al. 2013). However, the study was only able to measure change in knowledge and could not measure injury rate due to sample size. To understand if videos such as the one used by Cusimano et al. (2013) could change behaviour and reduce risk of injury, a similar intervention using videos would need to be repeated in larger cohorts and within England and Wales. Videos such as this may be particularly useful to disseminate knowledge to all pupils similar to the Snowsport England DVD. Information targeted in this manner may enhance retention since it was identified previously (section 5.4.2) that young people do not always listen to their teachers. Using other methods of knowledge transfer may be necessary rather than relying on the teachers. There are disadvantages with using videos as these may not be updated easily and cost implications could reduce the possibility of these videos being used in all schools.

In this qualitative interview study physical preparation is being promoted in 75% of the schools with two schools testing the fitness of their pupils to monitor if

exercises are being completed. Making physical tests mandatory may discourage pupils from signing up to the ski trip, especially those who are not interested in PE classes at school. Several teachers in this qualitative interview study are of the opinion that pupils already do enough PA and some young people feel that they are fit enough without doing additional exercises. Time to organise and facilitate additional classes can be a barrier especially when teachers already coordinate many classes outside of school hours. Teachers across England and Wales see a range of pupils attending the ski trip from pupils who enjoy taking part in PE classes and extracurricular activity to those who loathe PE classes. Young people not meeting the guidelines for MVPA could be putting themselves at risk of exhaustion whilst on the piste (section 3.5.6). It is a difficult balance for teachers to ensure young people are fit enough to cope with the demands of skiing without making those not interested in doing PA forced into doing additional exercises. Teachers have offset risk in this qualitative interview study by ensuring enough staff are available to take those pupils who require a rest off the piste for a break.

For beginner skiers, there is a plethora of advice on the internet for ski specific training or fitness, although, there are no known evidence-based recommendations (section 3.5.7 and 5.4.9) therefore it is problematic for teachers to prescribe exercises. There is evidence that balance training, in combination with ski lessons, aids ski performance in beginners (Malliou et al. 2004) (section 3.5.5). Balance training using ski boots could help to familiarise beginners and young people with the experience of the ankle joint being immobilised (Malliou et al. 2004). This would not be feasible in schools due to them not having access to ski boots until in the resort. Therefore, balance training may have to be acquired in other ways and this needs to be tested to ascertain if it is transferable to skiing.

Attending prior ski lessons at snow domes or artificial slopes was not seen as a requirement in the majority of teachers in this qualitative interview study, due to pupils being involved in lessons during the ski trip. The findings demonstrate that teachers have mixed opinions for the positives and negatives associated with prior ski lessons, with six attending prior ski lessons, three not involved at all and ten no longer being involved. Ski lessons are important for beginners to teach correct technique and improve balance (Malliou et al. 2004) with all schools in this qualitative interview study enrolling their beginners in lessons during the trip. Prior ski lessons were not participated in a great deal of the time due to school location and risk of injury before the residential ski trip, in addition to time and cost constraints. Transportation was often a barrier for teachers due to cost and this prevented many organisers from taking their pupils on ski lessons prior to the trip due to the additional cost's parents would have to incur. Michie (1998) found that teachers would aspire to have a school bus large enough to accommodate all students on the trip at no extra cost, although larger buses are more expensive to buy and maintain. Furthermore, an additional licence is needed when driving large buses, so schools must rely on outside hire of buses which can create another financial barrier (Michie 1998).

For young people to understand how to prepare and what to take on a ski trip, information is disseminated at both information sessions and through booklets which include information on essential clothing. In this gualitative interview study, some teachers invite clothing representatives to the information sessions whilst experienced organisers felt confident in delivering appropriate messages on clothing attire. Appropriate clothing is a fundamental element to highlight, particularly for those who have never skied before. Ski attire will help to protect against the cold, getting damp from falling in the snow, provide breathability when sweating and provide protection from the sun (Walkosz et al. 2007). Adequate sun protection is essential due to the high elevation and the reflective surface of the snow (Rigel et al. 2003; Walkosz et al. 2007) (section 3.5.11). Young people may not be aware about sunburn dangers whilst skiing and should be educated on wearing appropriate clothing and sun protection prior to departing on the ski trip. These messages on sun protection practices would need to be reiterated during the trip to ensure young people are applying sunscreen and wearing protective clothing.

Appropriate teacher ratios on school trips are essential due to the unexpected situations that can arise, with lower teacher ratios potentially compromising safety (Michie 1998) (section 3.5.13). Teachers need to be prepared for the

unexpected (Behrendt and Franklin 2014) and many schools in this qualitative interview study do this by having adequate staff numbers to cope with a combination of events such as pupils getting tired and being taken for a break or pupils being injured.

### 6.4.3 Activities and information during the trip

Pupils in this qualitative interview study are predominately supervised at all times, either by the ski instructors or teachers and so the pupils are guided on appropriate behaviour which was found to be important for young people (Langran and Selvaraj 2004) and beginner skiers (Cusimano et al. 2013). Teachers will hand over responsibility of the pupils to the ski instructors whilst on the piste. However, for field trips it is suggested that the teachers attending the trip should remain connected to the pupils by staying nearby as it is felt too often teachers take a step back and leave the pupils with the ski instructors (Behrendt and Franklin 2014). Whilst this may be easier to accommodate at a traditional field trip where they visit a museum, for example, five of the teachers within this qualitative interview study felt strongly about the staff also staying nearby to help supervise the pupils. Teachers moved around the groups to ensure skiing is at the correct level and were able to help supervise pupils who are struggling or need a break. Additionally, when staying near the group the teachers should actively participate and show desired behaviour which will reinforce to the pupils what is expected. This is exemplified with the staff wearing helmets to illustrate the importance to pupils.

Schools within this qualitative interview study are ensuring young people are wearing protective equipment such as helmets on the piste which is necessary for their protection and essential due to helmet laws (Burtscher, Ruedl and Nachbauer 2013) (section 3.5.2.iv). The helmet will only provide adequate protection if the helmet is in good condition, is less than ten years of age and if it has not been involved in a crash (Parkinson and Hike 2003). Therefore,

anyone loaning out helmets has to ensure they are fit for purpose to protect the skier.

Overconfidence was seen to be a possible risk factor in this qualitative interview study, where inexperienced young people push the boundary due to the increase in skill level over the few days of ski instruction. This was echoed by Langran and Selvaraj (2004) in section 3.5.5 who suggested an increase in confidence would result in skiers skiing faster and attempting a piste grade outside of their capabilities. Young people exhibiting overconfidence can lead to carelessness resulting in injury (Meyers et al. 2007) which would be more catastrophic if skiing at excessive speeds.

## 6.4.4 Benefits and barriers

Learning is the acquisition of knowledge and is not exclusive to the classroom. Through school trips, young people can learn away from the classroom which was highlighted to be important within the report Every Experience Matters (Malone 2008). A young person's life can be changed positively through the increase in knowledge and confidence (Malone 2008). Some pupils may feel more at ease if the activity is not competitive or assessed and these experiences encourage social interaction (Behrendt and Franklin 2014). Through these outdoor learning experiences pupils and teachers have improved relationships (Tal and Morag 2009) (section 2.5) which can translate back to the classroom. Overseas travel is important for every pupil to encounter (School Travel Forum 2014), which promotes pupil experience and independence away from the home (Behrendt and Franklin 2014). Teachers within this qualitative interview study agree with the benefits residential field trips add to a young person's social skills. Furthermore, skiing involves PA within the natural environment which can contribute positively to a young person's well-being (Gustafsson et al. 2012). In a meta-analysis on outdoor adventure programmes, the findings inferred that adventure programs have a major impact on the lives of young people which have long lasting effects (Hattie et al. 1997). However, pupils on science field trips indicated that they disliked

logistical aspects of field trips e.g., long travel times, poor meals and accommodation (Rahman and Spafford 2009). These dislikes could have a negative impact on pupils taking the opportunity to experience travel further afield since teachers explained that coach travel in this qualitative interview study can affect tiredness of the pupils whilst at the resort. Pupils' opinions to these aversions were not discussed within this qualitative interview study and may be an area of further consideration to the barriers of ski trips.

Planning field trips can impact considerably on teacher time to prepare the school trip and to fit the trip within the school timetable (Michie 1998). Teachers have felt their peers were disgruntled when trips occurred in school time where relief lessons must be generated (Michie 1998). From surveyed schools, the STF identified there was a similar divide in those schools supporting overseas activity compared to those not during term time (School Travel Forum 2014). Similarly, several schools within this qualitative interview study are enforcing that ski trips are placed out of term to reduce absences from lessons. Four teachers mentioned that their school had changed practice with trips now being placed out of term. Limited time available for trips due to schools focusing on standardised testing has resulted in trips becoming less commonplace (Behrendt and Franklin 2014). The findings from this qualitative interview study suggest that the practice and importance of ski trips are changing since these trips are now occurring out of term to reduce the impact on core lessons. One teacher found this not to be a problem occurring within term due to taking only year eight and nine pupils which will not have a huge impact in terms of the curriculum. More recently within the news a parent won a high court hearing for taking his daughter on holiday during term time (Burns 2016). This news article emphasises the frustrations parents encounter when planning holidays out of term which can have a huge impact on the cost of a holiday which can be four times as much as during term time (Burns 2016). Teachers within this qualitative interview study are facing comparable barriers when trips are situated out of term. However, teachers understand the difficulties this poses if schools allow pupils to attend a school trip, yet parents are prohibited to do this. Teachers perceived that ski trips were placed out of term due to these trips being considered or believed to be a holiday, rather than an educational benefit to the pupils.

The second reason for schools not running ski trips within the STF survey was staff not willing to take trips during school holidays (School Travel Forum 2014). Teachers within this qualitative interview study acknowledge that running a ski trip is not always a straightforward task and can be a continual process of adjustments. Furthermore, it requires staff to be on duty 24 hours of the day which is a huge responsibility and teachers are not enjoying a holiday themselves when trips are being placed out of term. Teachers within this qualitative interview study and the STF survey (2014) acknowledge that staff need their holidays, and this could lead to a decline in ski trips being run across England and Wales if ski trips are run out of term. One respondent from the STF survey believes those schools which facilitate ski trips in term time have their priorities correct for their pupils (School Travel Forum 2014). If staff are not willing to organise trips during their holidays and trips are no longer being supported in term time, then this will reduce the number of trips occurring. This will impact not only on ski trips but likewise other residential trips. Experiences out of the classroom are where the most vivid memories are often made and not forgotten (Lidstone 2000). Young people of the future will be deprived of the opportunity to experience these activities if trips are on a decline.

The STF (2014) identified that 17% of schools surveyed do not run a ski trip due to it being far too expensive for parents. As previously mentioned, running ski trips out of term will significantly increase the cost of the trip. When selecting a resort for the school trip, "cost" was the second reason for importance of destination (School Travel Forum 2014). Similarly, within this qualitative interview study, teachers understood the importance of making it affordable and how difficult it can be for parents to send their child on a trip, especially those from low socioeconomic areas. Schools in more affluent areas do not have a problem with recruiting pupils or travelling further afield.

Students with disabilities should also have the same opportunities to experience field trips however physical barriers such as inaccessible transport or a lack of specialist accommodation or facilities can reduce the ability for these young people to experience such trips (Healey et al. 2001). Within this qualitative interview study, one teacher said that taking physically disabled pupils was problematic in terms of cost for the parent, due to them requiring adequate staff to support the pupil. The teacher felt it was not fair on the parent to be funding extra staff.

Administrative procedures in the organisation of school trips can be obstructive, however, teachers understand the necessity in terms of ensuring a duty of care for their pupils (Michie 1998). Collating forms was an obstacle perceived by several teachers in this qualitative interview study, similarly Michie (1998: 48) reported teachers collecting money from pupils was a "hassle". Further factors that influence teachers organising trips are the fear and concern about health and safety, curriculum pressures, paucity of time, and a lack of resources and support (Dillon et al. 2006). These logistical limitations in organising field trips can influence the opportunities for pupils to experience the outdoors and overseas adventure (Dillon et al. 2006).

Litigation concerns over managing risk has resulted in some schools now eliminating activity-based experiences (Dillon et al. 2006; Malone 2008). Parents' fear and insecurity in allowing their child to play outside has led to a reduction of young people playing in public spaces (Malone 2008). Consequently, the combination of schools doing less or no activity-based trips and young people spending less time outside is eradicating the rich learning environments for young people to develop skills to manage complex environments (Malone 2008). Malone (2008) suggests this will have implications on the long-term development of a young person's health and wellbeing.

One teacher in this qualitative interview study acknowledged that young people should "*not be wrapped up in cotton wool*" (T17) as this affects their true-life experience. Similarly, parents who were interviewed about risk of injury to their children, recognised that they did not want to "wrap their children up in cotton wool" and tried to discourage this behaviour (Jenkins 2006: 13). Parents instead focused on the monitoring of risk and strategies to adopt when injuries occurred

rather than the elimination of accidents (Jenkins 2006). Stan and Humberstones' (2011) article argued for teachers to allow young people to experience positive risk taking whilst understanding that fear of litigation and the unknown often negated this.

An overriding, unprompted sub theme in this qualitative interview study was the concern that pupils were being impeded from partaking in PA by being taken out of PE classes to catch up in other academic subjects. The comments made in the findings that young people are being taken out of PE go against the statutory National Curriculum for state funded schools (DfE 2014). Young people who are not routinely engaging in PE will not gain the "confidence and interest" in PA "out of school and in later life" (DfE 2014: 103). For some young people they would not take part in any PA and PE is the only opportunity for these pupils to engage in some form of PA (Green 2014). Pupils not meeting recommended PA guidelines (section 3.5.6) or being exposed to PE in school due to them being removed to focus on other academic subjects (section 6.3.4) could impact on pupils not being physically prepared for skiing potentially increasing their risk to an injury (section 3.5.7).

School ski trips were considered important for a young person's education, with teachers willing to organise these trips. The overall significance of PE, which includes skiing, did not appear to be valued to the same extent as other subjects within the school curriculum. Consequently, there is a need for strategies to promote the value of both PE and activity related field trips such as skiing.

### 6.5 Limitations

Interviews were conducted from a location comfortable or convenient to the participant. Interviews should be conducted in a place which is free from interruptions (Doody and Noonan 2013) which was the case for the researcher but not always for the interviewee with some of the interviews occurring in shared offices. Situational variables such as interview location, distractions or

comfort are inherent in any study and can affect the responses of the interviewee (Miyazaki and Taylor 2008). The interaction between the researcher and participants can create an interaction bias, however, Miyazaki and Taylor (2008) suggest that friendlier and more personable researchers will gather a larger quantity and improved quality. As mentioned in section 5.5, socially desirable responses may have been given by respondents by not being honest about undesirable behaviours they are involved in. Nevertheless, in section 4.11 it was discussed that the absence of visual cues due to telephone interviews being conducted can aid in the disclosure of information.

To develop the novice interviewer, it may have been helpful to transcribe an interview prior to the next one which may have helped to identify where probe questions could have been used (Doody and Noonan 2013). Probes allow focused follow up questions to clarify a participant's response (Doody and Noonan 2013). The researcher conducted several pilot interviews (section 6.2.3) to help produce probe questions and gain confidence. Although, it may have been more constructive to have piloted the interview with school teachers organising ski trips on reflection. The pilot interviews were beneficial in confidence building and identifying the probe questions for the main interviews.

### 6.6 Conclusion

The findings have drawn together the various barriers and obstacles that school trip teachers encounter, including time, curriculum pressures and cost, which all impact on their desire to arrange such trips. Teachers felt these constraints are overshadowed by the multifaceted benefits to young people. It was apparent that organising ski trips is not an easy task, especially for the novice organiser who is not familiar with the process and tasks involved. However, teachers are helped with these tasks by specialised courses which guide the novice organiser. The findings suggest that schools should be supportive of these ski trips to enable them to still be part of many young people's lives.

Chapter 7: The synthesis of the quantitative and qualitative studies: Methodological Triangulation

# 7.1 Introduction

In the journey to uncover the answers to the research aim (section 1.3): exploring the preparation practices prior to and during school ski trips, the literature highlighted that no one method would be enough to provide the necessary answer. Therefore, a multi method approach was decided upon (section 4.4) which has been drawn together in a synthesis chapter, set out here, using methodological triangulation.

Using a methodological triangulation approach (section 4.5), this chapter has drawn together, with an in-depth synthesis, the data from the quantitative survey study (Chapter five) and qualitative interview study (Chapter six). This approach enabled research objectives six and seven (section 1.4) to be achieved, to triangulate the evidence to develop recommendations to inform evidence-based practice and provide guidelines for future best practice which have been summarised in section 8.3.

The quantitative study enabled the relationships between demographics and school type to be explored, whereas the qualitative study enabled a rich understanding of the process of the school ski trip. Whilst the two studies were undertaken separately, they are intrinsically linked. This chapter has highlighted the similarities and dissimilarities across the two studies to give a deeper understanding of the phenomenon being studied (Feilzer 2010).

## 7.2 Methods

The quantitative and qualitative studies were interpreted independently in a sequential design (Chapters five and six). The current chapter has synthesised and integrated the findings from both paradigms to offer enhanced insight and depth into the phenomenon (Bekhet and Zauszniewski 2012). Both approaches were thus viewed as 'equal', with the qualitative study following the quantitative study as used by Lukkarinen (2005) (Figure 7.1).





The results and findings were analysed separately to maintain ontological relevance for each study (Lukkarinen 2005) (Chapters six and seven). Following this, methodological triangulation was interpreted using a meta matrix (described by Wendler (2001) as a second order analysis). This process uses the findings of both approaches from the position of triangulation to develop a meta inference (Lukkarinen 2005; Wendler 2001). The meta inference is an integrative view of findings from the two studies (Venkatesh, Brown and Sullivan 2016) which allows the researcher to ensure completeness of the data by providing richness that one method alone would not present. This provides confirmation to enable conclusions to be drawn from the findings (Jack and

Raturi 2006). The meta matrix was constructed from the results and findings of the two independent studies (Table 7.1) (Lukkarinen 2005; Venkatesh, Brown and Sullivan 2016). This matrix structure was designed with data entered into the matrix from the two studies which had been previously brought together using a triangulation map (Appendix 13). This involved formulating codes to synthesise the components from quantitative survey study (Chapter five) and qualitative interview study (Chapter six) related to these codes (Farmer et al. 2006; Lukkarinen 2005; Wendler 2001) (Appendix 14).

**Table 7.1** Development of meta inferences adapted from Venkatesh et al(2016)

Context	Quantitative inference	Qualitative inference	Meta inference
Theme or	Inferences	Inferences	To develop the meta
code	made based on	made based	inference, inductive,
	quantitative	on qualitative	deductive and abductive
	data analysis	data analysis	theoretical reasoning results
			in divergence, convergence
			or complementarity findings.

The qualitative component incorporated specific examples from the interviews, whilst the quantitative component brought in the analytical results from the survey (Farmer et al. 2006). The themes constructed in the qualitative interview study formed the topic areas within methodological triangulation. Combining the quantitative and qualitative approaches using methodological triangulation will produce one of three outcomes (Heale and Forbes 2013; Jack and Raturi 2006):

- 1. Convergence where the findings lead to the same conclusions
- 2. Divergence where the findings can be contradictory
- 3. Complementary where the findings from each study supplement each other.

#### 7.3 Meta Inferences

To inform policy the researcher needs to be able to draw upon both the quantitative and qualitative perspective (Brannen, Julia 2005). Using methodological triangulation, the meta inference process integrates and synthesises the inferences obtained from both studies in a mixed methods design (Jack and Raturi 2006). Overall, the studies have complemented one another and shown numerous similarities. This has given the researcher a multidimensional perspective on the research question, exploring ski readiness in UK secondary schools through the preparation practices of teachers.

#### 7.3.1 Profile of respondents

It is important to ensure that a true representation of the phenomena is presented by capturing a balanced subdivision of respondents across England and Wales. The qualitative study was nested in the quantitative study by using the same population although the demographics of respondents were different in the two studies. In the quantitative study more respondents took part from the south of England (53%) compared to the qualitative study, where the larger sample was predominantly from the Midlands (35%). This possible influence could have occurred due to the research being conducted from a Midlands university which may have affected those willing to be interviewed within the second study. The respondents may have initially thought they would have to travel which could have deterred respondents from other areas. Researcher respondent similarities, coming from the Midlands, could play a role in those respondents willing to be interviewed (Miyazaki and Taylor 2008). The second study, in which semi structured interviews were used, will not have the same anonymity as the quantitative study. This may occur as a relationship is fostered with the interviewee to develop the conversation, whereby the personal voice is heard. The interviews were confidential which permits participants to speak freely as their comments are not being linked inherently to the school.

The same participants took part in both studies using convenient purposeful sampling. This type of sampling design was used to ensure the population met the criteria of the quantitative study and allowed the same participants to elaborate and give a broader perspective within the qualitative study (section 4.9). There were regional differences in respondents taking part within the two studies, although there were no regional differences with information being shared with parents and young people prior to and during the ski trip. This would be unlikely to have a potential bias due to the regional differences within the qualitative study.

## 7.3.2 Teachers preparation

To be able to organise an effective residential trip it is essential for teachers to understand the procedures they need to follow. Consequently, it was important for the researcher to be aware of how teachers acquire this knowledge, which could be developed through propositional and nonpropositional knowledge (section 3.5.12).

### 7.3.2.i Knowledge and experience

For both the survey and interview, responses indicated how information regarding the preparation of school ski trips was obtained. There were similarities across the studies for teacher preparation which complemented the individual findings from each study.

Both studies within this thesis identified that knowledge did not evolve from one method and a combination of sources supported teachers' learning (Figure 7.2). There was convergence within the data sets about where the teachers developed their knowledge through both propositional and non-propositional approaches (section 3.5.12). Propositional approaches were from specialised organised courses (section 7.3.2.ii) which have been highlighted in sections

3.5.12 and 5.4.8. The non-propositional knowledge was intuitive knowledge based upon previous knowledge and experiences the teacher had gained (Higgs and Titchen 1995). This was acquired from several non-propositional sources including previous school ski trips, personal experience and from tour operators which were utilised to organise school ski trips.

There was convergence with both studies revealing that previous school ski trips had a significant impact on teacher knowledge (Figure 7.2). It became clear from the interviews that teachers frequently shadowed colleagues enabling them to gain the experience needed to organise future trips. Schools that had coordinated ski trips for several years facilitated other teachers to be familiar with the processes, therefore supporting teachers to become experts (Meyer 2004). Schools that had not organised ski trips previously, or if the lead organiser had relocated, subsequently caused the current teacher organising the trip to have some feelings of being isolated which was not explored within the survey. The participants who were interviewed reported that they were often responsible for organising not only ski trips but other residential trips through providing transferable skills to manage these experiences. Previous personal ski trips were an additional method whereby teachers acquired information to organise ski trips, which demonstrated a similarity between both studies (Figure 7.2). Within the interviews there were complementary findings in that the teachers' experience of skiing was mixed, varying from those having many years of experience of personal ski trips, to those not experiencing a ski trip until working at the school.

Learning can occur through watching others and reflecting on this experience, or through abstract conceptualisation (Kolb, Boyatzis and Mainemelis 2001). This type of learning through tangible experiences is known as experiential learning (Kolb 1984; Kolb, Boyatzis and Mainemelis 2001). For some, they learn best by immersing themselves in the experience (Kolb, Boyatzis and Mainemelis 2001). Through teachers shadowing colleagues and organising previous school residential trips, teachers gained knowledge on the processes to organise a school ski trip (Figure 7.2).

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Figure 7.2 Knowledge acquisition for organising ski trips

Within the survey, knowledge acquired to organise a ski trip could also be received from ski representatives or tour operators (Figure 7.2). The involvement and importance of tour operators was not established until the interviews where it was identified they were a central link to the organisation of the trip. Teachers expressed that there is a high responsibility and time pressure when coordinating residential trips. By having tour operators involved helped facilitate the process as they could organise the travel, hotel, coach arrangements to the resort, hire of ski equipment and general resort functionality (Wang, Hsieh and Huan 2000). Tour operators have specialist knowledge in organising trips and facilitate the process. Teachers can search out for the CLOtC badge which demonstrates that those providers offer effective learning outside the classroom and manage risk effectively (CLOtC 2019). By liaising with several tour operators, teachers could negotiate the best deals to secure a more affordable price for the trip.

The survey results suggested that less than 20% of teachers read educational publications or used websites to increase their non-propositional knowledge. This was echoed in the interviews where websites were not particularly mentioned to enhance understanding. The inference being that individual learning styles and preferences needs to be considered, since acquiring knowledge to organise a school ski trip is multifaceted, built around experiences encountered. A recommendation for future teachers is to shadow current organisers to become accustomed to the processes involved, although this may not be feasible if the school has not run a trip before, they could possibly shadow colleagues at other schools. To formalise learning requires propositional approaches, such as attending specialised courses, which would assist those who have not organised ski trips before through providing information to organise ski trips more effectively (section 7.3.2.ii).

#### 7.3.2.ii Ski courses

Findings from both studies serve to highlight that teachers are aware of specialised ski courses (SCO and ASCL) to increase their ability to organise and manage the process of ski trips abroad (Figure 7.2). The survey alone provides one perspective

which presented information about those who attend ski courses. The interviews added depth and interpretation to the value of these courses which complemented the quantitative results adding a rationale as to why these courses were attended or disregarded. It appeared from the survey that several teachers were not interested in attending the specialised courses, on the contrary by listening to the interviews, teachers had a plethora of experience which was why the courses were not attended.

The interview findings facilitated understanding that specialised courses are available to teachers although these are not compulsory in all regions (section 3.5.12). It was acknowledged that there was not always time to attend the course and funding was not always available to support teachers attending these courses. It was not ascertained how many teachers self-funded to attend the courses, although two teachers said that their school would not fund these courses. Some schools insisted that at least one member of staff who was part of the school ski trip had attended the SCO course. The interview findings revealed that those teachers who had not been on a ski related course had often been organising ski trips for several years, long before specific courses evolved, and these teachers did not see the relevance of these courses. These organisers suggested that attending a course was not needed which may have indicated that the number of years they have been organising ski trips made them proficient or an expert in the process. Experts have been articulated as those who have a rounded knowledge base and are intuitive with their actions (Meyer 2004). Conversely, novices lack background experiences (Meyer 2004) even if they have attended specific courses. Therefore, the novice ski organiser may have attended a specific course, but this does not ensure they are an expert or given them the necessary experience to ensure they are proficient in the organisation.

Within the English and Welsh culture, those who have experience do not always get recognition without a qualification, and to be adequately insured, a recognised qualification is often requested (HCPC 2019). Training courses are important to establish baseline knowledge, to set standards and are now recommended by most local authorities before permission is granted for the ski trip to take place (Snowsport England 2020). Following this evidence acquired from the literature review and the two studies, it would be endorsed that all teachers new to organising ski trips should attend the SCO to ensure appropriate knowledge for the efficient running of a school trip.

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### 7.3.3 Preparation prior to the trip

## 7.3.3.i School years attending trip

The survey identified that pupils attending the school trip were predominantly from years eight (aged 12-13 years), nine (aged 13-14 years) and ten (aged 14-15 years), although it was not explored why these years were chosen. Within the interviews, it was debated within four of the interviews whilst teachers were discussing other issues. The interviews complemented the findings of the survey by providing a rationale to the reasoning why different years may be offered the chance to attend the ski trip. For example, the survey established that year seven tend not to attend the ski trip compared to other school years. However, the interviews highlighted the cost of the trip can be spread across the year which is why year seven may not be frequently involved due to this year group not joining the school until starting in year seven.

Several schools offered the trip to all years which potentially facilitated in schools achieving minimum numbers for the trip, since, travelling by coach would be more economical if full. Several schools had to limit numbers by offering, the trip to certain school years. Teachers explained this assisted with keeping numbers manageable besides ensuring it did not impact on those pupils in GCSE years. Potentially, schools that are in more affluent areas were able to obtain reasonable numbers for the trip to take place. Whilst, schools that struggle to get sufficient numbers could coordinate group ski trips with schools in the local area and thus ensure adequate numbers can be achieved to coordinate the trip. The inferences from the findings are that school years eight and nine are primarily targeted for school ski trips due to the practical and educational factors affecting the other school years.

### 7.3.3.ii Staff to pupil ratio

The staff to pupil ratios were explored within the survey (section 5.4.1) which identified that schools have appropriate staff to pupil ratios when taking young people on a

school ski trip. When teachers hand responsibility to the ski instructors during the daily lessons, it appeared that teachers within this study remained on duty to supervise pupils who were injured or tired, which is why it is important to have adequate numbers when supervising young people on the piste (Kelsall and Finch 1999). Teachers that were competent skiers reported that they monitored their pupils within the classes by skiing to different groups throughout the day.

The integration of findings demonstrated that ratios on trips were sufficient and teachers supported the ski instructors by skiing around to monitor pupils or providing backup to look after young people if they were fatigued or injured which is recommended by BASI (British Association of Snowsport Instructors Limited 2015). BASI recommends that class sizes should not exceed ten pupils per instructor (British Association of Snowsport Instructors Limited 2015) although this was not explored in either study. The meta inferences from both studies have demonstrated that pupil teacher ratios are sufficient and supervisory numbers are increased whilst on the piste due to teachers assisting where appropriate.

## 7.3.3.iii Methods of disseminating information

Dissemination of information concerning the ski trip to the parent and pupil is crucial. There needs to be an understanding of what is going to be included in the trip, for example: lift passes, ski equipment rental, travel, accommodation, meals, ski tuition, evening entertainment, financial protection, insurance and details given for items not included within the overall price; ski attire, meals on the piste. The methods by which information was provided to pupils and parents were not explored within the survey. Therefore, the interviews were used to add to the researcher's understanding. Teachers utilised parent sessions and written documents (booklets) to distribute relevant information regarding the ski trip (Figure 7.3). Many of the teachers created their own ski booklets with information they believed was useful to parents and pupils which evolved each year to include updated information. Parent sessions and booklets were standard ways teachers communicate information needed about the ski trip which were routine procedures for schools (Tronc 2006).



Figure 7.3 Methods of dissemination

Despite the positive benefits of videos (Cusimano et al. 2013; Jørgensen et al. 1998) (section 3.5.10), the survey established only 40% of schools used these to disseminate safety information (Chapter five). Similarly, the survey and interview findings proposed that ski videos were not popular processes for knowledge transfer (Figure 7.3). On reflection, the choice of word 'video' in the survey rather than DVD may have influenced the respondents' decision about if they use videos for knowledge transfer. This was evidenced within the interviews in which three teachers spoke about DVDs that are provided by the tour operator to deliver information. These approaches of dissemination offer the advantage of standardising safety information and can be shown to young people prior to departure. The effectiveness of these methods on the retention of knowledge and transfer of skills whilst on the piste requires further investigation in young people attending ski trips.

In section 5.4.2, it was stated that young people would not listen to teachers about safety information (Macnab, Cadman and Greenlaw 1998a) and therefore different means of reporting would have been useful such as DVDs. The concern with this means of communication is that the video information becomes quickly outdated and teachers may not have the facility to update the material. Furthermore, there is a need to advance with current technology and move towards applications that are easily accessible, which gives the advantage of being updated effortlessly and allows all

users to have access to these updates in a timely manner (Ally and Prieto-Blázquez 2014). Within the interviews, one teacher mentioned that a central online information point would be a potentially valuable source of information to teachers which could be created to be a telephone application. Mobile telephone applications allow for a more interactive environment where users can complete tasks and get instant feedback (Ally and Prieto-Blázquez 2014; McLaughlin and Glang 2009). Using interactive applications enables teachers to test knowledge such as the FIS safety code by using interactive quizzes. To the researcher's knowledge, there are no such applications available within this area which may be of further interest to supporting teachers organising ski trips.

Both the survey and interviews suggested ski clothing companies have a role in disseminating information concerning appropriate ski attire (Figure 7.3). Clothing companies were not initially considered within the survey design, however respondents within the survey added this as an area. This topic was subsequently explored within the interviews where it was suggested it was not necessary for clothing companies to attend parents' sessions due to organiser experience. Teachers recognised that using clothing companies to attend information sessions were an extra time consideration and often burdened the teacher with further administration. Ski clothing companies have a place in adding knowledge of the correct attire to be used on the piste and distributing clothing necessary for skiing, although they are not essential for teachers to use when they have sufficient knowledge around skiing.

#### 7.3.3.iv FIS safety code

Ski safety on the piste is another area that needs to be considered in terms of both behaviour and the knowledge of the FIS safety code. There was convergence between these two studies since the FIS safety code was shared with parents and pupils. Information on the FIS safety code was considered an important factor with most teachers in the survey, informing pupils either prior to or at the ski resort on this topic. This quantifies that a large proportion of teachers are aware of this code, in addition to the importance of communicating this information.

The survey was not set out to establish how the FIS safety code was circulated to the pupils, although within the interviews it appeared that the methods of dissemination were variable in that this was verbally shared at information sessions, produced within information booklets and/or ski instructors communicating this to pupils whilst at the resort. There was convergence on the FIS safety code being given to pupils at the resort either by the teachers or ski instructors communicating this information. The interviews substantiated these findings, suggesting that when delivering the FIS safety code, it became more meaningful to the pupil when communicated on the piste. By providing the information prior to and during the trip emphasises the importance of repetition and checking pupil understanding. Teachers recognised that the safety information was disseminated to the pupils, but they could not guarantee this information was being listened to or retained.

The results of the meta inferences emphasise that teachers felt it was essential that all skiers learned the rules of the FIS safety code and applied these rules when on the piste. For example, when learning to drive you have knowledge of the Highway Code and then apply this knowledge whilst learning to drive. Skiing lessons are one method proposed to raise the standards of skiing techniques whilst also teaching young people to understand general skiing safety (Goulet et al. 1999). One recommendation is that these rules are disseminated prior to and during the trip and it may be additionally advantageous to use different methods to disseminate this knowledge since learning styles are varied when it comes to learning different tasks (Cassidy 2004).

## 7.3.3.v Prior ski lessons

Taking pupils on ski lessons organised by the school prior to the school ski trip was an area where agreement in responses was also demonstrated. Within the survey, over half of teachers either take all pupils or the majority of the pupils to organised ski lessons. Within the interviews, these findings were echoed by teachers saying they had mixed reviews about prior lessons and if there was any extra benefit to the pupils (section 6.3.2). The interviews added complementary findings and clarified reasons for the teachers' decision to coordinate prior ski lessons. Several teachers explained that they used to organise prior lessons but now were unable to due to organisational difficulties. Teachers felt prior ski lessons were not necessary since the same skills were learnt whilst on the ski trip and were an added organisational aspect which required additional time and cost. Prior ski lessons before the trip could result in injury and deter those pupils who have a negative experience during the practice sessions. Many young people attending a ski trip will be novices and recommendations are that unskilled skiers should improve their skill level through attending lessons (Goulet et al. 1999). The results of the survey suggest teachers are ensuring this recommendation takes place by novice skiers having ski lessons whilst on the trip and additional lessons prior to departure may not be necessary.

### 7.3.3.vi Screening pupils

Within the survey the term screening was used as a broad term to allow teachers to provide their own views and not to influence what the responder considers screening to be. Health screens were predominantly mentioned within the survey as the method for those who screen their pupils. It appeared within the interviews that health screens were a normal procedure before departing on a school trip.

Pupil behaviour was a large factor that was monitored prior to a school trip as teachers needed to ensure they had confidence in the pupils whilst on the trip. Pupil behaviour was monitored prior to the trip and this was the second largest method of screening within the survey and was communicated to pupils to reinforce adequate behaviour. The survey did not establish how adequate behaviour is quantified to pupils, although pupils in schools are told how they are expected to behave and that they can be given sanctions if they fail to meet these expectations (Payne 2015). The interviews clarified that teachers gave sanctions in relation to not being allowed to attend the school ski trip if standards of expected behaviour prior to the trip was a significant issue. Within the interviews, teachers explained that they used a code of conduct which stipulated what behaviour was expected on the school trip and this was signed by the pupils and/or parents. Reduced levels of risk awareness can be contributory factor to increasing risk of injury (Langran 2004) (section 3.5.10 and 5.4.3). Educating young

people on appropriate behaviours expected alongside supervision whilst on the piste would help to safeguard young people whilst on the ski trip.

Predominantly schools within the survey do not physically screen pupils to attend the ski trip which showed convergence with the interviews, although two teachers within the interviews spoke about fitness testing to monitor pupils' ability to cope with the demands of skiing. Less able pupils were then given exercises and subsequently screened to evaluate if any improvements had been made. The survey documented similar findings with a small percentage of teachers screening for pupil fitness. Physical screening necessitates that the teacher can interpret the results and set exercise interventions which is often out of their scope of practice. Besides, there are no evidence-based exercise guidelines to suggest what the young person requires for skiing or evidence to suggest such interventions minimise the risk of injury whilst on a ski trip (Hébert-Losier and Holmberg 2013). Young people need to be able to cope with the technical demands of skiing (Hébert-Losier and Holmberg 2013) as fatigue can increase the risk of injury (Meyers et al. 2007). Physical screening may be time demanding for teachers to implement especially if a high number of pupils attend the trip and there is no evidence for what screening to implement prior to the trip.

### 7.3.3.vii Physical preparation

Within both the survey and interviews there was a convergence on the physical preparation carried out prior to the ski trip. Teachers within both studies produced guidance concerning the physical preparation which is recommended prior to the trip. The survey reported that nearly half of teachers advise pupils to participate in physical preparation prior to the trip, with both studies identifying that advice was given on getting 'ski fit'. Under half of teachers understood the importance of preparing the young person for the ski trip. Although, many of the teachers interviewed provided pupils with guidance on physical preparation in the form of handouts within the information booklets. However, in pursing this convergence there was some clear divergences which could be related to the survey question "Is any physical preparation could be

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misleading and those who do not get their pupils to do physical preparation but gave them guidance could have misinterpreted the question.

Hébert-Losier and Holmberg (2013) recognises the importance of physical ski preparation although, currently, there are no evidence-based guidelines for physical exercises to reduce risk of injury in novice skiers. Anecdotally within the interviews two teachers felt that incorporating fitness sessions prior to the ski trip helped to minimise injuries. Which is an area which could be further explored. Many teachers organising ski trips are giving out guidance to get 'ski fit' demonstrating that they understand the physical requirements of the activity. It would be beneficial for teachers to have evidence-based recommendations to enable this information to be disseminated to young people.

In the survey only 19% of teachers reported that ski fitness is not needed or important due to young people already being fit and active within their PE sessions (section 5.3.3). Data on MVPA levels (section 3.5.6) suggest that young people are not meeting these guidelines in secondary school years and this area would need further investigation within schools in England and Wales. An area of concern highlighted within the interviews was young people being taken out of PE classes, to catch up in their academic subjects (section 6.4.4.). It has been evidenced that MVPA levels in young people are decreasing (section 3.5.6), thus PE within schools is a priority to aid towards maintaining baseline activity levels (Green 2014). Additionally, within the National Curriculum, PE is one of the pillars which should be taught right through into key stage four (DfE 2014). If pupils are not attending PE lessons, then this may impact on them learning body control and developing movement skills (section 2.6) potentially impacting upon ski readiness. It is recommended that PE should be given the same parity as academic classroom-based subjects and this is an area which requires further exploration but is out of the scope of this thesis.

## 7.3.3.viii Ability

The skiing ability of pupils on ski trips from both studies report that the majority are at the beginner or intermediate level. Skiing ability is therefore not a consideration for schools as in both studies a mixture of abilities can attend the trip. A marginal number of schools took a high proportion of pupils who have advanced skiing abilities on a ski trip. The findings from the two studies converged; suggesting that most of the pupils attending a ski trip will have not skied before or frequently. Ski trips are designed for any pupil with any ability, are not exclusive to the expert or novice skier and this should remain open for any pupil to attend.

# 7.3.4 Preparation during the ski trip

## 7.3.4.i Helmet use

Helmets have been a controversial topic as to whether they reduce or increase injury to skiers due to perceived increase in risk taking (Scott et al. 2007) which has been extensively discussed in section 3.5.2. Helmets are now common practice for skiing with many resorts and insurance providers stipulating their use whilst on the piste. Within both studies there were similarities in findings that helmet use is common practice whilst on a school trip, with most of the teachers in the survey ensuring helmets are used whilst on the piste. The interviews complemented the findings, with reasoning for helmet use being due helmets being common practice and being made compulsory either by the schools' local authority or the ski resort.

Young people have been found to foster positive attitudes about helmet use when others around them are wearing helmets, especially their peers (Peterson and Brooks 2010). Staff fostering positive attitudes by wearing helmets helps to convey the correct messages to pupils and when ski instructors are adopting the same practice this has influenced young peoples' acceptance in wearing helmets (Peterson and Brooks 2010). Teachers understand there are limitations to wearing helmets if pupils are

taking risks and skiing at reckless speeds. The perception of safety whilst wearing a helmet may encourage risky behaviours (section 3.5.2.i). Therefore, the skier should understand the limitations of helmets as well as the benefits to make informed decisions on behaviour. Within both studies of this thesis, helmets are common practice whilst on a school trip, with current research supporting their use to reduce risk of injury (Haider et al. 2012) (section 3.5.2). Across England and Wales helmets are being used during school ski trips as evidenced by the synthesis of the two studies. Therefore, the recommendation for wearing helmets is comparable with this study's findings.

#### 7.3.4.iiFatigue

The survey established that young people are spending a considerable amount of time on the piste, with 88% of ski trips typically spending 4-5 hours a day on the piste. Both the nature of the activity and time spent is atypical to a young person's normal daily activity (Carter and Micheli 2011). For novice skiers they can become fatigued quickly due to being unaccustomed to the activity, especially as ski trips require the pupil to be on the piste for long durations of the day over a period of days (section 5.3.2). As previously mentioned, fatigue can incorporate central and peripheral mechanisms which can build up to accumulated fatigue (Ferguson 2009) (section 3.5.8). Teachers acknowledge that fatigue can be an issue as skiing is a challenging activity. The most frequent reason for rest periods in both studies was for a lunch break. The interviews complemented these findings, as teachers acknowledged that stopping for a lunch break was important to allow pupils to recover and to ensure they sit and rest. Additionally, breaks were incorporated to reduce the effects of fatigue or to allow them to have a comfort break. The responses from the interviews added that teachers established ways to offset fatigue by having breaks which required having enough staff to monitor and supervise breaks which revisits (section 3.5.13, 5.4.1 and 6.4.1) the aspect of organising adequate staff ratios.

The interviews added supplementary evidence with fatigue being suggested to manifest from the journey to the resort, not getting adequate sleep or not being physically prepared for the demands of skiing. These factors highlight the multifactorial nature of fatigue. The implications of this is for those pupils who are struggling to cope with the long duration on the piste to be offered some respite. This importantly links back to having adequate staff numbers to support those pupils who need additional breaks. Ski instructors and teachers need to be able to identify those pupils who are struggling to allow them to recover as pupils may not report or understand they need to take a break (Ruedl et al. 2010a). Therefore, information on the value and importance of breaks would allow for adequate recovery for safe continuation of skiing.

## 7.3.4.iii Injury risk

There was a complementary theme between the two studies with respect to injuries. Within the survey teachers reportedly felt confident in dealing with injuries although there was a concern about injuries occurring. Teachers explained within the interviews that there were risks with ski trips and they felt it was important to inform parents of the risk of injury. It was acknowledged that an increased risk of injury can result from overconfidence, fatigue or tiredness, and due to lack of physical fitness. To combat risky behaviours, the pupils skiing ability and behaviour are monitored within the skiing lessons which ensures they are skiing at a level and speed suitable for them. Overconfidence was mentioned by a few of the teachers as an area of risk. This issue was recognised in section 3.5.5 where following ski lessons skiers could be overconfident. By keeping pupils under supervision in lessons throughout the day would ensure they do not attempt piste grades out of their skill level. As previously mentioned in section 3.5.5 young people are injured when they are not in supervised skiing sessions under the control of an instructor and it would be recommended that all pupils are monitored whilst on a ski trip. Those supervising young people on the piste require the appropriate level of qualifications (ASCL qualification or BASI level two instructor qualification).

#### 7.3.5 Benefits and barriers

The opinion of teachers in the survey displayed the commonality that ski trips are a valuable experience to young people and nearly three quarters of teachers would like to arrange ski trips more regularly. The teachers' opinions of the benefits of school ski tips was not explored within the interviews, although this area was discussed by several teachers. There was convergence of this theme within the interviews, clarifying reasons why the teachers felt this was an educational experience (section 6.3.4). Teachers share a common judgement, in that ski trips have an important place as a residential school trip. However, these experiences are difficult to measure. To be accountable in educational terms, progress is often measured through tests, exams and/or assessments which is not applied to residential trips. Ofsted Education Inspection Framework is now judging quality of education through intent, implementation and impact (Rollett 2019). This framework could be applied to ski trips to ensure teachers are aware of the knowledge and skills pupils are developing whilst on a ski trip. Ski trips could enhance other aspects of the curriculum through the application of the five outcomes (section 2.5) that contributes to education suggested by Snowsport England (2011: Table 2.1). By making the intended learning outcomes of school ski trips explicit, teachers will be able to show where this can add to the development of the pupil and curriculum (section 2.4) (Williams and Wainwright 2016). This could ultimately link to the NCPE for OAA. The specific benefits of ski trips should be made more apparent as it is about life skills as highlighted in section 2.4 and 2.5. Obviously, teachers already organising these trips known the clear benefits pupils experience and it would be advantageous to explore this further to encourage more schools to organise ski trips.

The interviews added new inferences about areas not explored by the survey. The interviews revealed that not all staff within the school recognise ski trips as an educational experience, with these trips often being treated differently or seen as a free holiday for staff. If teachers are not being supported, then these trips are less like to occur. The interviews drew together the various barriers and obstacles that school teacher encounter, including time, curriculum pressures and cost, which all impact on

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their desire to arrange such trips. Nevertheless, teachers felt these constraints are overshadowed by the multifaceted benefits to young people (section 7.3.5.i).

# 7.4 Conclusion

This study presents a unique contribution to our understanding of school ski trips from a mixed methods approach. Based on the meta inferences it is evident that there are many themes within the preparation prior to and during the ski trip which converge between the two studies. Triangulation enabled multiple perspectives to be brought from different methodological approaches which provided a more comprehensive representation of the research objectives (Farmer et al. 2006). Although, methodological triangulation is a complex process due to the differences in data sets and the presence or absence of themes that emerge, these can be considered strengths since this provided a broader perspective by giving a range of findings (Farmer et al. 2006).

#### Chapter 8: General discussion

This final chapter will commence with a critical discussion on how the mixed methods approach has met the intended aims. Crucially, it will consider the unique and original contribution this thesis makes to understand the preparation practices of school ski trips. This chapter will synthesise the findings from the survey (Chapter five), interviews (Chapter six) and triangulation chapter (Chapter seven) to identify how current practices link to the theoretical model (Figure 3.2) by Meeuwisse et al. (2007) which identify how the young person's susceptibility to injury changes whilst on a ski trip. Specific recommendations from the findings are proposed with suggestions for areas of development. Finally, the researcher's research reflection will present their positionality statement and research reflection.

## 8.1 Research aims

School trips are identified as an important stage in the development of young people with regards to experiencing a natural setting to develop physical, cognitive, social, emotional and personal qualities (Amos and Reiss 2006; Malone 2008; Rickinson et al. 2004; Sutherland and Stuhr 2014). These characteristics discussed in section 2.4 and 2.5 are crucial to enable a young person to become a rounded individual and also aid in the development of positive relationships with peers and teachers. School trips have been heavily researched in terms of development of the pupil, which is not the scope of this thesis. However, the teachers' views towards ski trips are that they are a valuable educational activity (section 5.3.5 and 6.3.4). This thesis explored the preparation practices of teachers organising ski trips since there appears to be no known research into this area in the UK. A lack of UK based research is problematic since there will be no evidence to inform teachers on the evidence-based practice (EBP) or adopting practice-based evidence (PBE). Embracing both EBP and PBE is critical since EBP can often be difficult to translate into a real world setting as resources are often not available (Hellerstein 2008). In contrast, PBE can be "high quality scientific evidence that is developed, refined and implemented in a variety of real-world settings" (Hellerstein 2008: 141). The gap between research, policy and practice needs to be minimised to synthesise findings from research into practice and allow this evidence to be readily available to those in practice (Biesta 2007). Using the TRIPP framework (section 3.4) this process could be facilitated by translating injury risk factors into a real-world context for school ski trip practices.

As referred to in section 3.5.12, knowledge is gained through experience and is fundamental to decision making (Rycroft-Malone et al. 2004). Within the survey and interview studies teachers have shared their experiences of organising school ski trips. This is of importance since these teachers have experiential learning of what works in practice. Therefore, non-propositional knowledge has the potential to become propositional knowledge (Rycroft-Malone et al. 2004). The shared practices and interpretation of teachers' experiences has been synthesised through methodological triangulation in order to facilitate other teachers organising school ski trips. The recommendations within this thesis should not be static and should evolve in a continuous reflective cycle to ensure the recommendations reflect the changing world we live in. This thesis, therefore, has gathered PBE of what is occurring within reality to make recommendations to inform policy. The overall aim of this thesis was to explore the preparation practices prior to and during school ski trips abroad. To address this lack of evidence an exploratory mixed methods approach was chosen to investigate this previously unexplored area to develop a rich understanding of the practice's teachers undergo.

### 8.2 Summary of findings

To investigate the gaps within the research literature on the preparation practices and procedures during school ski trips, a survey (Chapter five) utilised a quantitative methodology and collected the responses of 270 teachers on the preparation practices of school ski trips. The survey quantified the number of schools across England and Wales employing risk reduction strategies which linked to the injury risk factors in skiing (Chapter three) and evaluated the consistency of this management. The key findings of this study (section 5.3) identified that across England and Wales school

teachers are consistent in their approaches of management for messages about standards of expected behaviour, alcohol consumption, wearing appropriate clothing and the use of sun protection. Although, inconsistent topics were messages given on the use of ski lifts, the FIS safety code, effects of fatigue, use of videos to transfer messages, prior ski lessons, screening pupils, physical preparation and knowledge of organising trips which came from a variety of sources. During the trip, teachers were consistent in young people having lessons whilst on the piste, staying under adult supervision, warming up prior to skiing, wearing helmets and having lunch breaks, which are consistent with expectations of risk reduction strategies from Chapter three. Respondents' views concerning the ski trip are consistent across England and Wales, in dealing with injuries, pupil discipline, wanting to organise trips more regularly and unanimously the trip being an educational activity. However, there was a divergence about legal action being a consideration when organising the trip and having concerns about injuries whilst on the trip. Chapter five achieved the research objectives 1) "to explore the preparation practices prior to the school ski trip", 2) "to explore the procedures during the school ski trip", 3) "to evaluate whether schools are consistent in their management across England and Wales", 4) "to explore if schools engage in any activities that reduce risks to young people during the trip". However, to explore teachers' reflective experiences of the processes and obstacles encountered throughout the organisational process a different approach was required.

To provide a novel insight into the objective, 5) "to collate the reflective experiences of teachers in the processes around school ski trips", the second study had a qualitative methodology (Chapter six), whereby semi structured telephone interviews of 20 teachers were conducted. Thematic analysis was used to identify key themes across all interviews. Four main themes were identified; "teacher preparation", "preparation prior to the trip", "activities and information during the trip" and "benefits and barriers of school ski trips". The findings have drawn together the meticulous planning involved in the organisation and management of a school ski trip alongside the various difficulties that teachers encounter. These findings are unique within research literature as teachers' perspectives have not been voiced in the preparation practices of school ski trips which should be considered one of the key original contributions to the literature that this thesis makes.
Given that no research across England and Wales could be found in this field, this thesis has provided an important and significant contribution to our understanding of the preparation practices of school ski trips in England and Wales. These findings have provided PBE of teachers' practices ensuring the risk factors within Chapter three have been considered to reduce the risk of injury to young people on a ski trip. Injury susceptibility can change positively or negatively during the trip because of the interplay of intrinsic (e.g., fatigue) and/or extrinsic (e.g., weather conditions) factors (section 3.3, Figure 3.2). The theoretical model proposed by Meeuwisse et al. (2007, Figure 3.2) facilitated in the understanding of how injury risk factors adapt during the ski trip which provided an understanding of how the findings (Chapter five and six) overlay onto this model. Teachers are ensuring risk factors to injury are minimised by firstly addressing the primary risk factors prior to the ski trip (e.g., using specialist ski courses to increase teacher knowledge, ensuring pupils are given the necessary information to prepare), secondly whilst on the piste pupils are given additional information (e.g., FIS safety code) and skills (e.g., attending ski lessons), in conjunction with there being sufficient staff to pupil ratios to enable pupils to be supervised/removed from the piste when required during the ski trip. The cyclical nature of this model (section 3.3, Figure 3.2) demonstrates that risk changes positively or negatively. Through teachers and ski instructors emphasising factors such as applying sun screen, not being overconfident (section 6.3.3), having ski lessons throughout the trip (section 5.3.4) and removing fatigued pupils (section 6.3.3) ensures risk is not elevated.

Methodological triangulation (Chapter seven) synthesised the survey results (Chapter five) with the interview findings (Chapter six) providing the most comprehensive overview of school ski trip practices to date within England and Wales. This facilitated in answering the research objectives 6) "to triangulate the evidence to develop recommendations to inform evidence-based practice" and 7) "To provide guidelines for future best practice to inform potential and current teachers organising ski trips". The overall application of findings is discussed in the following section.

#### 8.3 Application of findings

This research has provided an in depth understanding of the requirements and issues faced with organising school ski trips. It is essential that the knowledge collated through this work is used to guide and support teachers already organising and those new to organising school ski trips. Findings presented within this thesis highlight the enormous task teachers are confronted with when organising school trips alongside doing their day job. Teachers encounter many obstacles and hurdles which have been highlighted from within this study (section 6.3.4) and other research (section 2.7). These barriers either prevent ski trips from occurring or has reduced the number of trips that take place. The researcher anticipates that these findings will guide teachers new to organising ski trips and support those already undertaking the ski trip. This is the first study to suggest policy recommendations for ski trip practice that are evidence-based from empirical data with teachers. There are three specific outcomes which have emerged from this thesis findings which are: informing policy, recommended for practice or left for schools to decide (Table 8.1) and crystallises the original contribution this thesis makes.

When preparing for a ski trip not all the barriers can be removed in terms of cost or funding for the trip, although cost to the parent can be minimised through the time of year the school ski trip takes place. The researcher is not in a position to dictate when school ski trips should run as there is an ethical cost benefit dilemma for all those involved and as such the pros and cons will be discussed. Firstly, heads of school and governors need to understand the financial implications to parents of when these trips occur. Attending the ski trip in term time would allow teachers to access cheaper deals which can be translated back to the parents. In addition, this allows the young person to potentially get more skiing time due to shorter lift queues and reduced crowding on the piste, potentially reducing risk of injury. Skiing in term time necessitates the school in question actively removing pupils from their standard school curriculum which, at present, is at odds with allowing parents' permission to take their child on a term time holiday (GOV.UK n.d) (section 6.4.4). Parents could argue that a school ski trip being undertaken in term time is contradictory when schools are able to fine parents for unauthorised absence, placing school heads in a difficult position (GOV.UK n.d). The

school will have to provide relief cover for teaching staff placing additional strain on the school budget.

 Table 8.1 Recommendations

Policy	
٠	Propositional knowledge -At least one school teacher from newly organised
	school trips attends the SCO course accredited by Snowsport England or
	equivalent
•	Snowsport England should send annual updates to ensure teachers are

- Snowsport England should send annual updates to ensure teachers are kept up to date with best practice.
- Schools ensuring statutory PE lessons are not being replaced by other subjects
- Information session for parents and pupils
- Information booklet and/or information application for pupils and parents
- Code of conduct signed by pupil and parents checked that passports are in date
- FIS safety code information disseminated either prior to or during ski trip
- Formal lunch breaks sitting down to hot or cold meals
- Ski lessons and or adult supervision (BASI min level two or ASCL), if allowed to ski on their own need parent to sign consent form
- Helmets worn by all on the piste

# Recommendation

- Reputable tour operator to assist with the organisation, quality badge CLOtC
- No more than ten pupils per adult (enough to give pupils a break if needed or due to injury)
- A percentage of adults supervising are required to have a minimal level of ability on skis to ski between groups
- Promotion of physical preparation for skiing, for both teachers and pupils
- Acknowledging and recognising personal limitations of skiing experience in pupils and staff
- Shadowing the lead organiser
- Safety information transferred through other means rather than just the teachers, e.g., video, app
- Intended learning outcomes mapped to school ski trips

# School decision

- Ski trip during term time
- Clothing representatives to come into the information sessions
- Prior ski lessons within the UK
- Prior physical screening

Organising the ski tip out of term time means the costs are significantly increased and the ski areas are busier. Teachers are also disadvantaged since they would not get a holiday as the time away is a duty period. Teachers have a duty of care to the young person 24 hours a day whilst on the trip, which is outside of normal working hours (RoSPA 2012). Teachers would miss out on their own down time and mental recuperation which could have an impact on their wellbeing (Demerouti et al. 2009). A challenge facing schools across England and Wales is finding a balance for all those involved in the process. The findings recommend that ski trips are given equal status as other residential trips due to the enormous benefits it brings to young people (section 2.4, 2.5, and 6.3.4). Within this ethical dilemma, the decision makers need to be actively considering the pupils in question and the benefits to those pupils. A potential compromise to all involved, are for school ski trips to be placed over the last few days of term so that only a few days of term is missed. To support the implementation of school trips, especially during term time, the intended learning outcomes (section 7.3.5) would need to be communicated to justify the benefits of ski trips towards the school curriculum. By having explicit learning outcomes of the ski trip may facilitate with the justification of taking pupils away during term.

Teacher preparation was an area discussed throughout this thesis (section 2.8, 3.5.12, 5.4.9, 6.3.1 and 7.4.1). To reduce risk of injury, teachers need the expertise which comes from experience and from training (Boyes and O'Hare 2003) (section 2.8). Teachers need to feel that they are implementing best practice so that they are not subject to litigation. The findings propose for schools new to organising ski trips that, as a minimum, the lead organiser or a teacher assisting the lead organiser have attended the SCO course accredited by Snow Sport England or equivalent. This will ensure that schools are aware of best practice and they are given the knowledge to understand how to organise a ski trip effectively. Using specific courses such as the SCO is essential since new teachers have reported they receive no training for "residential trips, outdoor education, adventure education" or planning "risk assessments" (Cramp 2008: 176). Many of the (90%) teachers interviewed had a considerable amount of experience (6-40 years) organising school ski trips,

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the use of the grandfather clause which permits the new rule not being retrospectively applied (Encyclopedia.com 2016) should allow those with prior experience to be exempt if they want to be. Teacher experience is vital, nevertheless in today's world it is potentially more difficult to use trial and error to gain experience. To minimise potential problems from day one, the SCO course should be attended to ensure teachers know all the considerations to organise a successful ski trip. The SCO course could help protect teachers from litigation, as this course should ensure teachers know all reasonably practicable steps to reduce the risks of foreseeable injury. Therefore, this would ensure the teacher has a strong defence against a negative incident (RoSPA 2012). However, it may also be advisable for experienced teachers to attend this course with benefits being twofold: for continual professional development and secondly to protect from litigation. The findings did not establish the content of the SCO course, although the interviewed teachers felt it was a meaningful course and subject material is applicable and appropriate. As information is constantly updated, it is advisable for Snowsport England to send annual updates to those who have been on the course.

Overall, teachers in this study reported that a tour operator assists greatly in the organisation of a school ski trip (section 5.3.3 and 6.3.2). The findings recommend using a reputable company with the addition of the LOtC quality badge to support teachers organising these trips. Teachers new to organising ski trips could shadow the lead organiser to facilitate in the understanding of implementing school ski trips which may not be feasible if schools are new to implementing ski trips. It is advisory for those teachers who are new to such trips, to have specialist clothing companies assist with information on the correct items of clothing for pupils to purchase or rent. Current practice to prepare pupils and parents for the trip is attendance at an information session, during which all essential information are disseminated (section 6.3.2). These sessions are supplemented with information packs which are devised by school teachers (section 6.3.2). To ensure information is consistent a central body such as Snowsports England could be held responsible for updating and disseminating this information to teachers. Both parents and pupils should then sign a code of conduct consenting to the terms of the ski trip.

Within this study, PBE guidelines have been developed for staff to pupil ratios. Currently those organising ski trips (section 5.3.2) and guidelines from RoSPA (2012) support a maximum of ten pupils per adult, although as mentioned in section 3.5.12, it is important to differentiate between teachers and adults. Since supervision of the pupils has a role to play in managing safety on the piste (Brookes and Holmes 2014), the findings recommend that a proportion of the teachers supervising should be able to ski proficiently so that they can move around the groups of pupils and assist with any issues, such as injury or allowing recovery breaks if required. For teachers, the preparation of the ski trip does not stop when they arrive at the resort and teachers are on hand 24/7 to facilitate in the smooth running of the trip. All adults involved with assisting the trip should be made aware of their primary responsibility to supervise pupils, to ensure that the trip is not viewed as a skiing holiday (Tronc 2006). Ski lessons and or adult supervision (BASI min level two or ASCL) is essential to ensure pupils are being monitored which agrees with Brookes and Holmes (2014). There will be instances when reasonable discretion should to be applied, for example if a young person has been separated from the group (section 5.3.4). Furthermore, parents should sign a consent if they permit their child to ski without adult supervision.

Taking ski lessons prior to a trip has not been stipulated as essential and has been left for the individual school to manage this decision, principally as there are varied benefits and limitations of UK prior ski lessons (section 5.3.3 and 6.3.2). To attend a school ski trip in the UK there are no official prerequisites of fitness that staff and pupils need to meet (section 3.5.7). In most instances, physical screening had not been enforced prior to the trip since there are no EBP or PBE guidelines. It is questionable as to whether young people should be excluded if they do not meet a theoretical baseline of physical competence or whether there could be interventions in place to allow for extra rest breaks for those not physically able. This concern has not been answered by this research and is left to the school to decide. The school ski trip is physically demanding for all of those involved and promotion of physical preparation should be shared. The teachers within this study are disseminating information on physical preparation either as demonstrations during information session,

within the information booklets and some are implementing extra physical sessions (section 5.3.3 and 6.3.2). Nearly a third of teachers do not have time to incorporate extra sessions for the young people within school time (section 5.3.3) and teachers cannot enforce young people to do extracurricular activity. However, it would be necessary to give guidance to teachers about what physical preparation would be beneficial for ski trips.

The findings recommend that the exercise suggestions need to be easy to be implemented by the pupil, require minimal equipment, be easy to understand, suggest frequency of sessions and when they should be implemented, provide progressions of exercise and guidelines on ideal body alignment, and ideally and they should not have to be supervised. What was disconcerting within this study was teachers reporting that pupils are being impeded from taking part in PE. Similarly, Marshall and Harman (2000), have reported that PE in schools is not always meeting statutory guidelines in which numeracy and literacy is taking priority, supposedly as more valuable areas. The fact that PE is being marginalised in schools creates the issue where pupils may not be prepared for ski readiness and more widely resulting in not laying down the foundations for lifelong engagement in PA (Marshall and Harman 2000). It is recommended that statutory PE lessons should not be replaced by other subjects as this sends out inappropriate messages about the value and importance of PE.

Information on the FIS safety code should be given to the pupils at some point during the ski trip, whether this is before they go out on the school trip or whilst they are at the resort. As previously mentioned (section 5.4.2), teachers explaining safety information may not be an effective method of dissemination. Safety information being included in an information booklet does not necessarily mean that pupils will read or understand the application of this information whilst on the piste. Introducing the pupils to this information prior to the trip and then reinforcing whilst on the piste by the ski instructors is recommended.

An area mentioned by several teachers was the acknowledgment and recognition of personal limitations of skiing experience in pupils and staff.

Teachers reported young people from day three potentially become overconfident with their abilities (section 6.3.3). This is an area to be highlighted to ensure the group understands the boundaries of their skiing ability. Supervision would help to ensure pupils are skiing within their abilities (Brookes and Holmes 2014) and adequate breaks are provided due to the unaccustomed fatigue experienced whilst on a ski trip (section 3.8.8).

Equipment advice is for helmets to be used whilst on the piste (section 3.5.2) which was consistent with the recommendation of teachers in this study (section 5.3.4). For good uptake it would be appropriate for all teachers to adopt this policy (3.5.2.iv). Research into helmet wear is continuing to grow and it would be appropriate to follow current guidelines for the appropriate type of helmet to be worn. One area highlighted in the literature review was to check bindings are functioning correctly (Werner and Willis 2002) (section 3.5.1). This was not an area explored, although it is assumed when young people are collecting equipment in the resort, the hire centre is adjusting bindings to the user's requirements.

Following the exploratory findings from teachers organising school trips, it is apparent that knowledge of managing a trip is fundamental to the safe and efficient implementation of the experience. Teachers must accordingly be equipped with PBE and EBP to implement these practices.

### 8.4 Directions for future research

The findings from this thesis have raised a series of questions that still need to be considered. In respect of when a school ski trip should occur, the researcher did not ask teachers within this study when school ski trips should occur, but this theme did emerge from the interviews. The researcher acknowledges that the point of view of pupils, parents, heads of school, Ofsted and governors were not explored with the placement of the school ski trip, which would also be relevant to other residential trips. It would be useful to understand the reasons why other schools do not organise school ski trips and if there are potential barriers which is inhibiting them. If these barriers are understood it may help to remove or reduce the difficulties in organising school ski trips. The information that needs to be disseminated prior to a school trip may be taken for granted by the teacher. Hearing from other perspectives, such as parents, pupils and tour operators would give a complete picture from all those involved.

Physical preparation for a school ski trip was a theme explored throughout this thesis. This was problematic for teachers since there was no evidence-based guidance on physical preparation for young people attending a school ski trip. For teachers to be implementing or suggesting the types of physical preparation required then research is needed to assist teachers in making informed decisions. Guidance on exercises could then be placed within a mobile telephone application to allow teachers, pupils and parents to have access.

One significant area which needs to be considered is a centralised database which could pool resources and contain all necessary information relating to organising a ski trip which could be in the form of a phone application (section 6.3.2). The portability of smart phones to enable access to content at any time and being an interactive port of information is advantageous to disseminating this nature of content (Stoyanov et al. 2015). It may be useful for the SCO to be involved in developing such an application which gives updated information to teachers who have attended their course. This database could be developed to contain pupil and parent links alongside specialist organiser information. This is a niche area since there are no applications to the researcher's knowledge on this proposed content. The findings of this research suggest that the content included should be under the main areas of: teacher education, equipment, first aid, recovery, educational benefits, safety code, travel, what to pack, ski fitness, nutrition and hydration and an area to test the pupil's knowledge (Figure 8.1). A mobile telephone application would then become the default media of choice as technology develops and becomes more accessible to the consumer. The use of gamification could be an interactive method to disseminate knowledge such as the FIS safety code or how to use ski lifts to attract the attention of the young user.





What should be contemplated within the application design is the platform the application is to be used with, the purpose of the application, who the application is for and the safety of the content (how reliable and up to date the information is) on the application (Verkerk and Bargiela 2013). Using this checklist created by Verkerk and Bargiela (2013), the ski application should be accessible on a variety of platforms, such as smart phones, tablets and computers to enable a wide variety of users to have access. The key purpose of the application is to provide a checklist for teachers organising school ski trips and transfer knowledge to pupils and parents on school ski trips. Knowledge put into the application should come from EBP and PBE although, to safeguard the creators from litigation, it may be necessary to incorporate a disclaimer (Verkerk and Bargiela 2013). As the platform could be multipurpose it may be necessary to have teacher access restricted to a password. A multidimensional measure of the quality of the application could be appraised through a "Mobile App Rating Scale" which incorporates indicators of engagement, functionality, aesthetics, information quality and subjective quality (Stoyanov et al. 2015: 3). These factors proposed by Stoyanov et al. (2015) would be essential to appraise to ensure young people engage with the application.

#### 8.5 Researcher's reflection

This section aims to recognise and acknowledge the influence and bias of the researcher within the research process. As such this section is written in the personal voice to reflect these aims. Since we all have a degree of emotional involvement within our study of interest, I needed to acknowledge the potential influences and consider how I may have impacted on the participants and myself throughout this study. Reflective practice is recognised as an important process within qualitative research (Finlay and Gough 2003), similarly in my profession reflection is required when engaging in continuous professional practice. To this end, the recognition of my involvement and personal investment will be exposed.

Firstly, I have reflected upon the research lens I chose to follow which was from a combination of philosophical, personal and theoretical beliefs which helped to clarify the focus of the studies and the interpretation of data (Savin-Baden and Major 2013). Before the commencement of this study I had to consider my positionality, ontological stance, epistemological beliefs and own philosophy. At first this was difficult to articulate and define, as predominantly a quantitative researcher, scholarly education had focused on objective measures within the positivist paradigm. However, through further reading, this allowed me to understand that this approach is not always appropriate within the social science world. It was apparent that I needed to do considerable reading around the qualitative paradigm to improve my understanding. Using key texts such as "Qualitative Inquiry and Research Design: Choosing Among Five Approaches" (Creswell 2007) and "Mixed Methods Research for Nursing and the Health Sciences" (Andrew and Halcomb 2009), I begun to understand the use and benefits of this paradigm. How the qualitative paradigm facilitates the researcher in achieving a complete picture of the area of interest and that research is never value neutral even within a positivist perspective (Greenbank 2003). It is naive to think that one paradigm is superior to the other as termed the 'paradigm wars' and I feel it is important to use the methods appropriate to answering the research question. Consequently, I have used a pragmatic stance towards this research because of this belief. The opposing poles of objectivity and subjectivity both have their place within research, and I do not need to position myself solely within one paradigm. Pragmatism appealed to me due to the mixed methodological approach that could be utilised (Johnson and Onwuegbuzie 2004).

Exploring the practices of ski trip preparation in secondary schools was first explored through quantitative methods of enquiry. This allowed for the collection of objective data which was useful to establish if teachers across England and Wales are consistent in their practice. It has been suggested that research funds often favour quantitative approaches to influence policy and practice in education which is why many researchers still adopt this method of enquiry (Anderson 2010; Greenbank 2003). As a quantitative researcher I primarily favoured this approach although I soon realised this would not fully answer the research question or allow the participants a voice about their justifications. This encouraged me to engage with qualitative methods which provides a richer content of the processes involved in the preparation of school ski trips. Increasingly, these two combined approaches are more frequently being implemented within research (Anderson 2010).

Ski trips have an integral history within secondary schools across England and Wales introducing a diversity of young people to this activity and new environment. In year 8, I attended the school ski trip which imprinted a positive memory of the experience and because of this I feel passionately about ski trips continuing to be a part of school practice. Even now I still vividly remember the experience of the food, the currency 'Lira', the coach travel and ferry crossing, the room I shared with my friends and the exhilarating experience of being on the mountain. Similar to many other young people experiencing ski trips, this was the first time I had been abroad without my family and I would not have had

the opportunity to experience this activity if it was not for school trip provisions. Critically my parents, family or friends had not experienced skiing, culturally this was not part of our life style and was not something we would have actively searched out.

The unexpected findings within the current research, in particular young people being impeded from PE lessons to concentrate on other subjects, I believe this is an area that requires further exploration. Physical education is a subject which I enjoyed whilst at school and whilst I recognise not all school pupils feel as I did regarding this subject, PE must be recognised as an important subject since it is on the National Curriculum (DfE 2014) and aids in encouraging lifelong participation in PA (Green 2014).

During the process of immersion within this thesis I identified strongly with the frustration's teachers were expressing in the organisation of a school ski trip. I consider school trips to be an important part of school life, as this was my experience. Young people should be given the opportunity to experience active residential trips, although I recognise that not all pupils would enjoy or could afford these types of trips.

Recognising the paucity of time to conduct the interviews, it was essential to elicit the maximum breadth and depth of information whist establishing a trusting relationship with the teachers and myself. The teachers that interacted with me seemed open to share, which could have been because of their strong passion for the activity and willingness to participate in the study. It was important not to react to their experiences and to maintain an unbiased demeanour (Doody and Noonan 2013). At times I became immersed in the conversation and identified with their struggles and frustrations. Retrospectively, a neutral response may have been more appropriate, although I feel this did not impact on the participants' responses.

In conclusion, I found challenges throughout the whole process, from learning and understanding qualitative methodology to methodological triangulation. However, my academic and personal development has grown from a novice into a practising researcher. Without using a mixed method design I feel I would not have uncovered the answers to the research question.

## 8.6 Conclusion

This thesis provides an original contribution to the paucity of information surrounding the preparation for school ski trips in the UK. There is a comprehensive review of the current literature available and a novel approach using methodological triangulation to critically answer the research aim. Ultimately, this delivers guidance for school teachers organising ski trips based on empirical data elicited from UK based teachers which could be used to inform educational policy makers. Teachers in the UK need to be empowered to use this evidence-based material to support them in the delivery of sound and accurate messages to pupils. Finally, this information will enable teachers to be supported when preparing school ski trips ensuring these are continually safe and effective educational experiences for young people.

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# Appendices

# Appendix 1: Ethics approval for Chapter five

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**Appendix 2:** Ethics approval for Chapter six and seven Content removed on data protection grounds

# Appendix 3: Participant Information Sheet for Chapter five

# Participant Information Sheet

You are being invited to take part in a research study as part of a PhD research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if anything is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for taking time to read this.

<u>Who will conduct the research?</u> Michelle Stanley (PhD Research student)

#### Study title: Ski readiness

## What is the purpose of the study?

The purpose of the study is to investigate the content, magnitude and consistency of safety information administered to pupils in preparation for a ski trip.

## Why have I been chosen to participate?

For the purpose of the study school teachers who take pupils on school ski trips have been chosen. Secondary schools around the UK have been contacted in order to collect this information.

#### Do I have to participate?

It is up to you to decide whether or not to take part in this research. If you change your mind about participation you can withdraw at any time in the two weeks following the study. This can be achieved by contacting the research student (Michelle Stanley) on the email address below providing your name. If you decide to withdraw all your data will be destroyed and will not be used in the study. There are no consequences to deciding that you no longer wish to participate in the study.

#### What will happen if I decide to take part?

If you decide to take part in the research, we would like you to complete the questionnaire attached. This will take approximately 15 minutes to complete. If you are not able to give your answers easily, you can ask someone you know and trust to help you give your answers.

#### What are the possible disadvantages and risks of taking part?

We do not think that there are any disadvantages or significant risks for you taking part in this study.

#### What are the possible benefits of taking part?

The data gathered will help to inform others about information that is administered to pupils in preparation for a ski trip.

## What will happen to the information that is collected?

The answers that you give to questions will be treated as confidential. This data will be protected by using an online programme to collect and store the data (Online Surveys) which is encrypted and only accessible by the researcher and supervisor. To protect your privacy your name will be substituted as a number to represent each school. Hard copies of the data will be stored in a locked room in a locked filing cabinet. Once the data is analysed, the raw data will be destroyed following a 3 year period.

## What will happen to the results of the experiment?

It is intended that the results will be written up for commercial use. Furthermore, the data will be submitted for publication in a peer-reviewed journal and/or presented at an academic conference.

#### Who has reviewed the study?

This study has been reviewed through Coventry University's ethical process prior to any collection of data.

<u>Contact for further information</u> Content removed on data protection grounds Appendix 4: Participant Information Sheet for Chapter six

# Participant Information Sheet

You are being invited to take part in a research study as part of a PhD research project. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask if anything is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for taking time to read this.

## Who will conduct the research?

Michelle Stanley (PhD Research student) <sup>1</sup>, Professor Jane Coad<sup>1</sup>, Dr. Mike Price<sup>2</sup>, Dr. Michael J. Duncan<sup>2</sup>, Sheila Leddington Wright<sup>2</sup>

<sup>1</sup>Children and Families Research, Coventry University, UK <sup>2</sup>Faculty of Health and Life Sciences, Coventry University, UK

Study title: Readiness to ski: Exploratory phase

## What is the purpose of the study?

The purpose of the study is to investigate the content, magnitude and consistency of information administered to pupils in preparation for a ski trip across the UK. An interview will be used to collect the information by a phone or face to face interview.

## Why have I been chosen to participate?

For the purpose of the study, school teachers who take pupils on school ski trips have been chosen. Secondary schools across the UK have been contacted in order to collect this information.

#### Do I have to participate?

It is up to you to decide whether or not to take part in this research. If you change your mind about participation you can withdraw at any point during the data collection phase. This can be achieved by contacting the research student (Michelle Stanley) on the email address below providing your name. If you decide to withdraw all your data will be destroyed and will not be used in the study. There are no consequences to deciding that you no longer wish to participate in the study.

#### What will happen if I decide to take part?

If you decide to take part in the research, we would like you to complete a phone or face to face interview. This will take approximately 10-15 minutes to complete.

## What are the possible disadvantages and risks of taking part?

We do not think that there are any disadvantages or significant risks for you taking part in this study. Answers given will not be directly or indirectly identified with yourself or the school.

## What are the possible benefits of taking part?

The data gathered will help to inform others about information that is administered to pupils in preparation for a ski trip.

## What will happen to the information that is collected?

The answers that you give to questions will be treated as confidential. The data will be collected in either written form and/or recorded using a dictaphone during the interview process. If a dictaphone is being used you will be informed prior to the interview process and you will be able to tell the researcher to stop recording at any point during the interview process. Subsequently, the written information will then be typed up and stored on an encrypted computer. If a dictaphone has been used during the process this will be stored on the same encrypted computer. Hard copies of the data will be stored in a locked room in a locked filing cabinet and the recording on the dictaphone will be deleted. Once the data is analysed, the raw data will be destroyed following a 3 year period.

The stored data will only be accessible by the researcher and supervisor. To protect your privacy and the privacy of the school no names will be used and only a number will represent the school.

#### What will happen to the results of the experiment?

It is intended that the results will be written up for commercial use. Furthermore, the data will be submitted for publication in a peer-reviewed journal and/or presented at an academic conference.

#### Who has reviewed the study?

This study has been reviewed through Coventry University's ethical process prior to any collection of data.

Contact for further information Content removed on data protection grounds

Survey No	Survey Question	Chap	Literature review topics
Q11	Typically, how many students do you take per school ski trip?	3.5.13	Ratio
Q12	Typically, how many teachers/adults	3.5.13	Ratio
Q13	Typically, how long is a school ski trip	3.5.8	Fatigue
	including days spent travelling?	3.5.6	Activity levels
		3.5.7	Physical prep
Q14	Typically, how many days are spent on	3.5.8	Fatigue
	the piste during a school ski trip?	3.5.6	Activity levels
o		3.5.7	Physical prep
Q15	On average how many hours are	3.5.8	Fatigue
	spent on the piste per day?	3.5.6	Activity levels
0.40		3.5.7	Physical prep
Q16	bo parents and students have a briefing when?	g on the fo	ollowing topics and
Q16a	Standards of behaviour expected	3.5.10	Behaviour
Q16b	Alcohol consumption	3.5.10	Behaviour
Q16c	FIS safety code (Control of speed, overtaking, entering the ski slopes)	3.5.10	Safety code
Q16d	Use of equipment (Ski boots, bindings,	3.5.1	Bindings
	Poles)	3.5.2	Helmets
Q16e	How to walk in ski boots	3.5.1	Bindinas
Q16f	How to use ski lifts	3.5.2	Helmets
Q16g	Awareness videos shown e.g., how to	3.5.10	Behaviour
Q16h	Appropriate clothing for cold temperatures	3.5.11	Sun protection
Q16i	Sun protection	3.5.11	Sun protection
Q16j	Remaining hydrated	3.5.9	Hydration
Q16k	Effects of altitude	3.5.11	Sun protection
Q16I	Fatique (Students recognise when	3.5.8	Fatique
	they need a rest)		i iligat
Q17	How is the information from Q.16 attained?	3.5.12	Teacher knowledge
Q18	Do students have a school organised	3.5.4	Level of ability
	ski lesson(s) "before" the school ski	3.5.5	Ski lessons
Q19	Are all teachers/adults attending the	3.5.12	Teacher
	school ski trip trained in first aid?	5. <b>..</b>	knowledge

Appendix 5: Survey questions mapped to literature review

Q20	Are students screened before	3.5.4	Level of ability
	attending school ski trips? e.g.,	3.5.5	Ski lessons
	strength imbalances, mental	3.5.7	Physical prep
	preparation, movement patterns,	3.5.6	Activity levels
	previous injury		,
Q20a	If Yes how is this measured? e.g., Hea	Ith screer	ns. EIS safety code
QLUU	understood		
021	Is any physical preparation carried out	357	Physical prep
QZI	before the school ski trin? e a	356	Activity levels
	endurance activities body weight	0.0.0	
	endurance activities, body weight		
0210	If Vac what physical proparation or	257	Dhysical prop
Qzia	If Yes what physical preparation of	3.3.7	Physical prep
	exercises takes place prior to the ski		
004	trip?	0 5 7	Dhualasta
Q21ai	vvno implements the physical	3.5.7	Physical prep
0.00	preparation?	o = ·	<b>.</b>
Q22	what is the level of skiing ability of the	3.5.4	Level of ability
	majority of students attending school	3.5.5	Ski lessons
_	ski trips?		_
Q23	Do students have organised ski	3.5.5	Ski lessons
	lessons "during" the school ski trip?		
Q24	Does a resort ski instructor stay with	3.5.10	Behaviour
	the group for the entire trip when on	3.5.12	Teacher
	the piste?	3.5.16	knowledge
Q25	Do school staff take students skiing	3.5.10	Behaviour
	without a resort instructor?	3.5.12	Teacher
			knowledge
025a	If ves what qualifications do they	3512	Teacher
SLUU	nossess	0.0.12	knowledge
026	Are there any circumstances where	3510	Rehaviour
Q20	etudente can eki without adult	5.5.10	
	supervision during the school ski trip?		
000-	Supervision during the school SKI (IIP?	252	A
Q26a	II yes what are the circumstances?	3.5.3 2 F 4	Age
007	e.g., age of skier, skier experience	ა.ე.4 ენ7	Level of ability
Q27	Are warm-ups/cool downs completed	3.5.7	Physical prep
	before and after a ski day?		
Q28	Are students expected to wear	3.5.2	Helmets
	helmets while skiing?		
Q29	How many structured breaks are	3.5.8	Fatigue
	incorporated into the skiing day?	3.5.9	Nutrition
		3.5.10	Behaviour
Q30	Do students tend to carry their own	3.5.9	Nutrition
	water, drink or snacks?		-
	All students	3.5.10	Behaviour
Q31	Are all injuries reported to the local	3.	Reporting injuries
301	authority?	0.	
Q32a	Ski trips can be a valuable educational	25	Benefits of ski
3020	activity	2.0	trins
	autivity		upo

Q32b	I would like to organise ski trips more	2.4	Benefits of ski
	regularly	2.5	trips
		2.7	Barriers of ski
			trips
		2.6	Exposure to
			different activities
Q32c	I have concerns about pupil discipline	3.5.10	Behaviour
	on ski trips	0 5 4 0	Dahariara
Q320	trips	3.5.10	Benaviour
Q32e	I feel confident in dealing with injuries	2.8	Risk
	on ski trips		management
Q32f	The fear of legal action is a consideration when organising ski	2.7	Barriers of ski trips
	trips		

## Appendix 6: Survey questions

3/15/13	Ski Readiness Survey			
← Back to My surveys	Home About Bristol Online Surveys Contact Us			
Ski Readiness Survey	Coventry the Higher University			



#### Survey

Note that once you have clicked on the CONTINUE button your answers are submitted and you cannot return to review or amend your responses.

Please answer questions in relation to the most recent ski trip that was organised.

#### Background Information

7. What county is the school located

¥ Select an answer

If you selected Other, please specify:

8. What is the type of school?

🛇 State school
♥Private / public school
(Optional) (select all that apply)
Academy
Community school
Foundation or Trust school
Free school
Grammar school
Special school
Specialist school
Voluntary aided school
Voluntary controlled school
Other (please specify):

- 9. What is your position within the school?
  - Head Teacher Deputy Head Head of Department Senior Teacher Subject Teacher

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○Administrator	
Other (please	specify):

10. Please complete the table below relating to the school years that are offered /involved in ski trips

	Yes	No
a. Year 7	0	0
b. Year 8	0	0
c. Year 9	0	0
d. Year 10	0	0
e. Year 11	0	0
f. Sixth form	0	0

11. Typically how many students do you take per school ski trip?

Select an answer 💙

12. Typically how many teachers/adults attend a school ski trip?

Select an answer 💙

13. Typically how long is a school ski trip including days spent travelling?

Select an answer 💙

14. Typically how many days are spent on the slopes during a school ski trip?

Select an answer 🚩

15. On average how many hours are spent on the slopes per day?

Select an answer 💙

#### **Ski Preparation**

16. Do parents and students have a briefing on the following topics and when? (select all that apply)

Parents	Stude	ents
Prior to the ski trip	Prior to the ski trip	At the ski resort

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3/15/13

	Ski Readiness Survey	
a. Standards of behaviour expected		
b. Alcohol consumption		
c. Skier safety code (Control of speed, overtaking, entering the slopes)		
d. Use of equipment (Ski boots, bindings, Poles)		
e. How to walk in ski boots		
f. How to use ski lifts		
<b>g.</b> Awareness videos shown e.g. how to fall safely		
h. Appropriate clothing for cold temperatures		
i. Sun protection		
j. Remaining hydrated		
k. Effects of altitude		
I. Fatigue (Students recognise when they need a rest)		

 How is the information from Q.16 attained? (select all that apply)

- Attending courses e.g. SnowSport England
- Knowledge already known
- Previous personal ski trips
- Previous school ski trips
- Reading educational publications
- Travel company
- Websites
- Word of mouth/recommendation
- Other (please specify):

18. Do students have school organised ski lessons before the school ski trip?

O All students O Majority of the students O Minority of the students O No students

19. Are all teachers/adults attending the school ski trip trained in first aid?

○Yes all ○Some ○None ○Unknown

https://www.survey.bris.ac.uk/?manifestid=142288&op=edit&focus=109962253&editrootitemid=109962250&locus=jzy1j04#targ

<b>20.</b> Are students screened before attending school ski trips? E.g. strength imbalances, mental preparation, movement patterns, previous injury					
© Yes © No					
If Yes how is this measured?					
E.g. health screens, skier sarety code understood					
<i>b</i>					
<b>21.</b> Is any physical preparation carried out before the school ski trip? E.g. endurance activities, body weight exercises, weights, core stability					
OYes ONo					
a. If Yes what physical preparation or exercises takes place prior to the ski trip?					
6					
i. Who implements the physical preparation?					
O Teacher					
Conditioning specialist					
Other (please specify):					
<b>b.</b> If no what are the reasons?					
Not needed / important					
Lack of expertise					
$\bigcirc$ Other (please specify):					

Ski Readiness Survey

#### Ski Trip

22. What is the level of skiing ability of the majority of students attending school ski trips?

Never skied

OBeginners (Mainly use snow-plow technique)

Intermediate (Use a mixture of snow-plow and parallel techniques)

QAdvanced (Mainly use parallel technique)

OUnknown

23. Do students have organised ski lessons during the school ski trip?

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Ski Readiness Survey

All students
 Majority of the students
 Minority of the students
 No students

24. Does a resort ski instructor stay with the group for the entire trip when on the slopes?

All of the time
 Majority of the time
 Minority of the time
 None of the time
 Unknown

25. Do school staff take students skiing without a resort instructor?

DYes	
D No	
If yes what qualifications do they possess (select all that apply)	
Alpine ski course leader	
Snowsports course organiser	
None	
Other (please specify):	

26. Are there any circumstances where students can ski without adult supervision during the school ski trip?



If yes what are the circumstances? E.g. Age of skier, skier experience

1

27. Are warm-ups / cool downs completed before and after a ski day?

○Yes ○Sometimes ○No ○Unknown

28. Are students expected to wear helmets while skiing?

OYes ONo

29. How many structured breaks are incorporated into the skiing day?

Select an answer 💙

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Sil Readiness Survey For what reason? (select all that apply) Comfort break Fatigue Lunch Other planned activity Snacks Water break Other (please specify):

30. Do students tend to carry their own water, drink or snacks?

All students
 Majority of students
 Minority of students
 No students
 Unknown

31. Are all injuries reported to the local authority?

©Yes ©No

#### Opinions / views

32. Opinions / views towards ski trips

	Greatly agree	Slightly agree	Slightly disagree	Greatly disagree	Have no opinion
<ul> <li>a. Ski trips can be a valuable educational activity</li> </ul>	0	0	0	0	0
<b>b.</b> I would like to organise ski trips more regularly	0	0	0	0	0
c. I have concerns about pupil discipline on ski trips	0	0	0	0	0
d. I have concerns about injuries on ski trips	0	0	0	0	0
e. I feel confident in dealing with injuries on ski trips	0	0	0	0	0
<b>f.</b> The fear of legal action is a consideration when organising ski trips	0	0	0	0	0

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Appendix 7: Letter for survey version 1

Subject: FAO Ski trip organiser

## Dear Sir/Madam

I was wondering if you may be able to assist me. I am a PhD student in my first year of study at Coventry University looking at skiing injuries in young people on school ski trips. The purpose of the study is to investigate the content, magnitude and consistency of information administered to pupils in preparation for a ski trip. For the purpose of the study secondary school teachers who take pupils on school ski trips have been chosen around the UK.

Below is the link to the survey which has an information sheet about the study on the second page. If you require any additional information then please feel free to contact me.

Kind regards Michelle Appendix 8: Letter for survey version 2

Subject: FAO Ski trip organiser

Dear Sir/Madam

I was wondering if you may be able to assist me. I am a PhD student in my first year of study at Coventry University looking at young peoples' readiness to ski on school ski trips. The purpose of the study is to investigate the content, magnitude and consistency of information administered to pupils in preparation for a ski trip. For the purpose of the study secondary school teachers who take pupils on school ski trips have been chosen around the UK.

Below is the link to the survey which has an information sheet about the study on the second page. If you require any additional information, then please feel free to contact me.

Kind regards Michelle

#### Appendix 9: Letter for interview

Dear .....

I would like to thank you for participating in the first part of my study. Following the online survey I am now in the process of interviewing school ski trip organisers. The focus of the study is about your reflective experiences of preparing young people for a ski trip. The purpose is to collate shared experiences to enhance the quality and value of shool ski trips.

For additional information on the next phase of the study I have enclosed an outline of the process. I will be using a semi-structured interview format which will last no more that 10-15 minutes and will send you an outline of the interview schedule before the interview takes place. During this time it may be necessary to record your response so that this can be typed up at a later date. If at any point you do not wish to answer a question or even wish to discontinue the interview you will be more than welcome to do so.

I can assure you of your anonymity and that all details will be strictly confidential. Please do not hesitate to contact me should you require additional informaion. Attached is the infromation sheet and informed consent. If you feel that you would like to participate please send the completed informed consent back to myself. I will then send some dates and times that may be convenient to yourself to be interviewed.

268



# Appendix 10: Interview schedule





What are these?

271

Appendix 11: Coding stripes

P: they organise the resort the hotel, the travel and then we run an assembly or a meeting after school for the parents to come along to. My trip is with year eight and nine so we have a meeting with parents and they come along to that, we finalise any details that need to have, in terms of contact emergencies, passports, height, weight and that sort of thing that we haven't got already. We advise them about the kind of clothes that they will need. Because of the area that we live in generally most of the kids would have skied before or skied a number of times.

# I: so you are not taking a lot of novices

P: no, well it varies really, some of the kids that we take our international skiers, some have been three times a year since I was three and then we have a proportion of kids who've been once or twice. It is normally around I would say of the 90, 20 or 30 kids have not skied before.


## Appendix 12: Verification codes

Content removed on data protection grounds

### Appendix 13: Triangulation map for helmet use

#### <Internals\\Interviews\\Interview 1>

P: We have been fortunate enough not to experience too much of that. Even with our higher ability groups you know they will never ski off piste we are always on the slope and we wear helmets as and when needed. Which this year everybody is wearing a helmet.

I: Because it has become more compulsory?

P: I think purely from the insurance company you can't go without wearing a helmet but you know there are various discretions with regards to if needed say after 15-20 mile hour it does not make much difference anyway. And if you are bombing down the slopes doing nearly 60 while you are then taking your own risk

#### <Internals\\Interviews\\Interview 2>

P: Yep that's right and it's the little things like reminding them to put their lip balm on and there sun cream. Compulsory helmets now, I do not let any of my kids ski without helmets. I have brought a big lot of helmets from a hire company that were getting rid of one year so I can rent those to the children as well so we are well and truly covered there. And sun glasses and goggles are the ones they will try and get away without wearing if they can.

<Internals/\Interviews/\Interview 6>

P: Well in France in isn't compulsory but as a school I have made the decision that I would but our authority does not insist on helmets, Lancashire do but ours don't as yet. I tell the parents that they are wearing helmets and that is included in the cost. The helmets, the boots, the skies, the poles and four hours of lessons with the instructors is included in the cost. <a href="https://www.linterviewsluntervie

P: So that's one thing that we did, another thing on that front as well is that a few years ago, and they are probably ready for a renewal as a school we own all our own ski helmets. So we have got 50 helmets in a variety of sizes so in terms of cost that water barely keeps costs down only by a few pounds but it keeps costs down the students because we take all our own headgear out with us so there is no additional charge for that in resort. And obviously that is a legal requirement depending on which resorts you go to, which country you go to. All members of staff now wear helmets, years ago obviously I have been in this game a long time we didn't but we went through a period where ... and that is part of the booklet that goes out to students you know the alcohol policy, no smoking policy, must wear headgear and that is all signed by the student and the parent as well. So there is no argument about it and so we have now got to a situation where every adult wears headgear as well, you know you have got to model what you expect from the children.

	Frequency	Percent
Yes	263	97.4
No	7	2.6
Total	270	100.0

Convergence = helmets frequently used in schools Complementary = gual tells us why they are being used (insurance). Not compulsory in all resorts or in all local authorities. More common place.

# Appendix 14: Audit trial of methodological triangulation

Quantitative Inference	Qualitative Inference	Meta Inference	Where is the clarification? What value has been added?	What can be done differently?
Knowledge gained from previous school trips, personal experience and attending courses	Teachers organise many residential school trips. Teachers move into lead organiser from shadowing others. Some had to set up ski trip from nothing, trial and error. Feeling of isolation if they had not run a trip before. Additional staff coming along on the ski trip are supportive. Personal experience of skiing. Ski courses increase knowledge.	Teachers have experience of organising other residential trips which have transferable skills. Shadowing others and attending courses give teachers the knowledge of organising ski trips.	Other residential trips give transferable skills to organise ski trips.	Teachers could go to other schools to shadow or ask questions about the ski trip process if they have not run one before. Attending specialised courses will assist those who have not organised ski trips before.
Courses attended 58% 24% of those that take YP skiing without a resort instructor have the below qualifications ASCL 83% respondents hold SSCO 42% respondents hold BASI 12%	Specialised ski courses available. Not always compulsory. Funding not always available. 12 organisers spoke about ski courses they have been on and nine spoke about the usefulness of it. One found it not useful as when on part way through organising trip.	Findings show there are specialised ski courses for teachers to attend. In general, these courses are useful and those that have not found them useful have been organising ski trips for a considerable amount of time. More guidance is required for searching for useful information	Misrepresenting the true picture by just having factorial information. It would appear they are not interested but by listening to the interviews this develops understanding. Variety of teacher's experiences.	

No qualifications 17%	Not always got time to attend		Clarification of why teachers	
	the course.		attend courses and the	
	If lead has not got ski		usefulness of these courses.	
	gualification, then other staff			
	on trip do.			
	Many years of experience and			
	do not need to do course.			
	Guidance from county council			
	and useful websites.			
	More guidance in searching for			
	useful information			
Organisers reported to	Tour operator central process	A high responsibility and time	The tour operators are not	By having a couple of tour
receive information from	and make a difference to	pressure in coordinating	only giving information to the	operators in the picture
ski representatives	running of trip. Two schools	residential trips. By having tour	teachers, but they help to	teachers can get them to
•	self-manage and do not have	operator's help makes it an	make the process efficient.	compete to find the best
	tour operator involved, one	easier process in terms of	· ·	deal. Loyalty does not
	because of religious reasons.	them doing some of the		always mean teaxhers are
	5	organising.		getting the best price.
Previous personal ski trips	Experience of skiing when they	Complementary finding	The interview findings	
85%	were at school.		established that organisers	
	For others, their first ski		had a range of ski	
	experience was on the ski trip.		experiences	
	Experience ranges from never			
	been on a ski trip to many			
	years of experience.			