

## Why snow sports should be taught?

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### 1 Introduction

Within the Association of Snow Sports at Universities (ASH) in Germany there are several working groups dealing with different questions of snow sports as a subject in research and teaching at universities. The work group 'Snow sports and The Educational Theory of Sports' discusses the importance of snow sports as a compulsory or optional subject at schools. Teachers wanting to initiate snow sports at their schools tell very often that they meet with difficulties and scepticism of fellow teachers as well as parents. The work group 'Snow Sports and Educational Theory of Sports' is, therefore, on the one hand concerned with offering an argumentative aid for teachers who are enthusiastic about snow sports, and on the other hand creating conditions to minimize possible difficulties with the realization of snow sports trips.

Before trying to find a sound line of arguments for snow sports it is, however, necessary to find out in which way snow sports are recognized in the various curricula of the German federal states. This should clarify whether snow sports can be recognized as a regular class: for example as basic course in secondary education. Naturally it is easier to find arguments for snow sports as a compulsory or optional subject than for a voluntary school trip to the mountains. Accordingly the qualities of the persons in charge of these trips can be different. Normal classes can only be held by specially trained sports teachers while in some federal states it is not automatically necessary to have the degree qualification like the final university examination for a school trip. Relevant information can be looked up in the regulations of the individual federal states.

The following points primarily serve to support the organization of snow sport trips outside of regular classes. In the first phase of discussion during the meeting in December 2006 arguments were collected and presented in a mind map (see fig. 1) which is published here for the first time. The present state of this discussion has only a preliminary character and is partially related to the fields of sports science. It will be necessary to supply scientifically verified references concerning the conjectured effects of snow sport trips. It would also be possible to discuss another frame of reference, for example, the educational perspectives of physical education (Kurz, 1998, 2000). A final discussion is still lacking, the result of which should be an argumentative aid for teachers on both the formal and content levels.

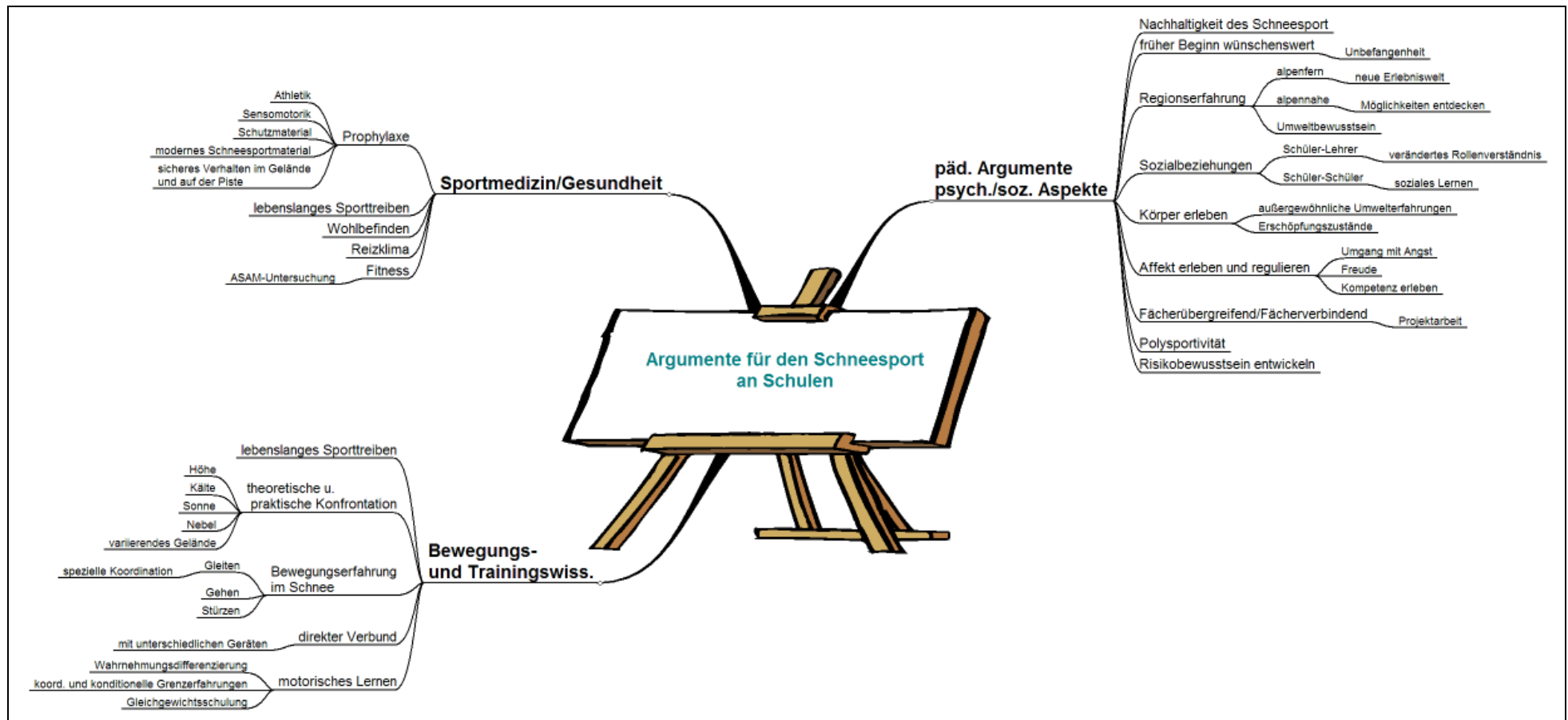


Abbildung 1: Mind-Map „Arguments for Snowsports in schools“

## 2 Aspects having to do with Sport Medicine and Health

Snow sports have positive health effects, bear however also risks as everybody knows. Therefore a discussion on the health aspects of snow sports has to deliver arguments concerning measures to prevent injury as well as arguments emphasizing the positive effects of snow sports.

### 2.1 Furthering Health through Snow Sports

If we want to emphasize the positive effects of snow sports on the health of pupils, the comparison is important. Skiing and snowboarding compared with watching television or playing computer games has wholly different health aspects from snow sports competing with walking in the mountains for health improvement. In this case a school trip to a town is therefore the basis for the comparison.

It is clear that a snow sports trip is characterized by a great deal of movement. Nowadays where lack of movement is an acknowledged factor of health risks (Löllgen, Kunstmann & Engelbrecht, 2002), regular sport is seen as a preventive measure against illness. This argument counts for snow sports in a special way. First of all skiing is a sport which can be and is executed until old age. Learning skiing therefore has a lasting effect against the lack of movement. (This up to now cannot be said for snowboarding as the supporters of this relatively young sport have not yet reached an advanced age. Experience shows, however, that persons who pursue skiing as well as snowboarding prefer skiing when they have grown older.) Secondly, snow sports enable outdoor movement in a time when nature does not normally invite it. Activity in fresh air and the necessary adaptation to winter weather can improve the immune system and support the resistance against cold. Snow sports can thus compensate for staying in mostly overheated and badly aired class rooms.

In regard to health, cross country skiing shows particular advantages. It has positive effects on the cardio-circulatory system and improves the endurance capacity. A positive influence on the immune system in the case of non competitive cross country skiing can also be demonstrated (Müller, Villingner, O'Callaghan & Simon, 2001).

### 2.2 Snow Sports and Injury Prevention

It is a widely held prejudice that alpine snow sports bear a high danger of injury. "Ski und Snowboard gehören zu den sichersten Sportarten, wenn man die Zahl der dabei auftretenden Verletzungen zu der Masse, die diese Sportarten betreiben, in Relation setzt" Aschauer and colleagues sum up (Aschauer, Ritter, Resch, Thoeni & Spatzenberger, 2007, S. 3). There are however injuries on the ski slope. In order to make snow sports trips legitimate

at schools everything has to be done to minimize the danger of injury. Part of this is a thorough preparation in physical education to prevent injuries caused by deficient physical conditioning and bad coordination. Of course, the equipment has to be up to the latest security standards. Carving skis are less dangerous than traditional long skis with their greater cut (Aschauer et al., 2007). Helmets are recommended to everyone involved in snow sports. Teachers are required to wear them as well because they have to set a good example for their pupils. It is also expected that ski teachers should have completed the appropriate courses. Bad weather and bad sights are among the most important risk factors over which one has no influence. Full slopes on the other hand minimize the danger of injury because most of the skiers and snowboarders are obviously motivated to act carefully and defensively. The risk of accident in the case of bad weather can be minimized by appropriate organization and preparation in the ski course ahead of time. (Cf. Aschauer et al, 2007)

### 3 Aspects relating to Movement Science

One of the chief subjects of movement science is how new motor skills can be learned under completely new conditions. „Motorisches Lernen entspricht der erfahrungsabhängigen und relativ überdauernden Veränderung in der Kompetenz, in bestimmten Situationen durch ein bestimmtes Verhalten bestimmte Effekte zu erzielen.“ (Hossner & Künzell, 2003 S.132). This capacity is strongly fostered by snow sports. There is the unfamiliar, new, challenging situation „snow with descent“. Some pupils may already have experiences with ice and snow, particularly in those countries with mountainous landscape. Many students from other areas will probably have experienced ice and snow mostly on level ground. Ice and snow combined with the descent of the slope produces a completely new situation. Habitual movement patterns will not work. The pupils cannot anticipate the probable effects of their movements and exactly this is the first thing which has to be learned. One can compare this situation with that of a baby learning to make its first steps. According to the terms of movement science a new 'forward model' has to be learned (cf. Künzell, 2004). Furthermore, it is necessary to cope with unaccustomed equipment on one's feet. The pupils may have already similar movement experiences having trained preparatory exercises with inline skates, skateboard or cross country skis. Besides learning to anticipate the effects of one's actions it is necessary to improve one's perception. During the process of learning one is able to perceive the consistency of the snow and the slope in a more and more differentiated way. As a beginner of snow sports one probably moves primarily on well prepared slopes and thus the quality of the ground underneath is relatively constant, but, on the other hand, the quality of the slopes will soon vary strongly. In the further process of learning one has to adapt oneself to corn snow, crusted snow, deep powder snow, packed snow, soft snow or even ice etc. Through this "experience" with different kinds of snow one learns to differentiate between the varying qualities of snow and terrains one's perception of nature. Most importantly, of course, one learns to move with one's skis or snowboard on the snow, quickly, efficiently or elegantly according to one's intention.

## 4 Aspects relating to Sport Psychology and Education

### 4.1 Motivation, Accomplishment and Experience of Limitations

From a pedagogical-psychological point of view the experience of competence in movement leads to positive emotions which one perceives as a particularly strong stimulus. Such stimuli are, according to Heckhausen and Heckhausen (2006), of fundamental importance for motivation. Along with other things the quick learning successes characteristic of snow sports trips evoke this positive feeling of competence and the resulting stimulus. Within one week everybody normally learns to cope with easy slopes, although this seemed to be impossible on the first day. Last but not least this is due to the enormous amount of exercise which can be executed per day on such a trip. Here in a positive way the performance motive is affected because the dealing with and experiencing of one's own performance can be happily experienced. This happens basically via the "good" by one's own improvements caused individual reference norm orientation (cf. Rheinberg, 2001).

Further motivating aspects with stimulus character of snow sports are experiences of personal limitations like overcoming one's anxiety or individual bodily limits. This as well as varying dimensions of nature experiences and intensive social group interactions can evoke intensive emotional feelings which are highly motivating. All this contributes to the fact that – simply expressed - snow sports are great fun. This joyful way of learning should not be withheld from our pupils, for enjoying learning of movements can and must be an educational interest of the utmost importance in physical education.

### 4.2 Snow Sports, Nature Experience and Ecology

It is characteristic for snow sports that they take place in nature. Their reduction, which has only recently become possible, to indoor sports is only sensible under narrowly defined circumstances. The experience of nature – the mountain environment - is for pedagogical reasons indispensable. Especially in cities snow in nature is seen as a cold, wet and dirty matter. It is a pedagogical responsibility to show another angle of view. The enjoyment of nature however is always accompanied by its impact on it, therefore what is necessary, defensible or irresponsible must be considered. The ecological impact of snow sports on mountain environment is a matter of controversy. Basically two argumentation strategies are followed. One comes to the conclusion that skiing is not advisable as a school event because of its adverse environmental effect on the alpine region especially when seen against the background of global warming. The supporters of winter sports class trips come to a more balanced view arguing that only the experience of nature conveys the feeling that it deserves to be protected. Especially the problem of snow sports and environment, climate change and its consequences for the ski topic are presently an indispensable theme at snow sports activities with school classes. The demand of the Aktionskreis Skisport und Umwelt (union for skisport and environment) "Skifreizeiten in Zukunft schulisch so zu gestalten, dass Schüler zu umweltverträglichem

Handeln angeleitet werden“ (Pröbstl, 1991, S. 3) corresponds with the subjects of environmental education in the newer school curricula. The volumes 3 and 4 of the DSV-Umweltreihe (a set of environmental books of the German ski union) “Natur erleben – Natur bewahren I und II, Pädagogische Fachbroschüre zur Gestaltung schulischer Skiwochen in den Alpen bzw. im Mittelgebirge“ (To experience Nature – To protect Nature I and II, a Guidebook for the Organization of School Trips to the Alps e.g. the Lower Mountains) represent in details the unique possibilities of integrating in an inter-disciplinary way environmental education in school trips with snow sports activities. In the current Curricula of NRW (North Rhine-Westphalia) is therefore demanded: “Da bei derartigen Fahrten häufig Bewegungsaktivitäten in freier Natur im Mittelpunkt stehen, können Einblicke in ökologische Zusammenhänge gewonnen und ein Unterricht gestaltet werden, der die beiden Aspekte Natur erleben und Natur bewahren in Einklang bringt. Aufgrund dieser besonderen pädagogischen Möglichkeiten sollten alle Schülerinnen und Schüler in ihrer Schullaufbahn an Schulsporttagen und Schulfahrten mit sportlichem Schwerpunkt teilnehmen“ (Ministerium für Schule, Wissenschaft und Forschung des Landes NRW, 2001, S. 57) (Ministry for school, science and research of the federal state NRW, 2001, p. 57).

Modern pedagogical conceptions focus on a sustainable management of nature. The central idea is, with a due consideration of human needs, to use things only up to an amount, to which they can be reconstituted to guarantee a lasting usage. The comprehension of the sustainability conception is a pedagogical task with increasing significance. Luthe (2007) proves exemplarily that snow sports are an excellent possibility to consider this task seriously and to integrate sustainability as educational target.

### 4.3 Furtherance of Social Relationships

Teambuilding and other social competences as well are especially demanded and promoted in a ski lodge. Young people should take over the tasks handed over to them in their own responsibility and thereby contribute to the success of the trip. Additionally it is essential that they are able to integrate themselves into the group. While interacting on a daily basis young people learn a lot about their own strengths and weaknesses and those of others. In this way group structures can be positively changed and stabilized which again has positive consequences for the ensuing school routine. On the other hand experiences of this kind are very fundamental for the development of one's own personality.

Besides the interactions of young people the development of the teacher-pupil-relationship is another factor. While practising sports with their pupils during the snow sports trip, teachers are inevitably getting closer with their pupils. Pupils get to know other sides of their teachers and vice versa which certainly has positive effects for their relationship. Due to the strenuous physical activity the pupils are usually agreeably exhausted and less ready for riotous activities in the evenings and nights. Teachers thereby can often deal with their class without having to use very restrictive and nerve-racking measures like controlling, forbidding and disciplining.

#### 4.4 Multitude of Perspectives

Snow sports can be carried out from different viewpoints. These can be emphasized in the course of teaching thus disclosing a perspective for most of the pupils to awaken enthusiasm for snow sports beyond the school trip.

The performance perspective - as always in sports - suggests itself. One of the authors remembers up to now how he was overjoyed about his own achievement, as he was allowed for the first time, to ski down a slope independently and self-reliantly with two others, without the instructions of his ski teacher, singing the Queens song, which was popular at the time, "we are the champions" at the top of his voice. Owing to the enormous learning successes the performance perspective is satisfied along the way. This will go on for a while because the variety of snow and slope conditions supply many and diverse possibilities of improving one's achievements. By trying out various situations one can find out what is necessary to cope with the demands of the diverse conditions. Additionally one learns to judge correctly one's own performance. The correct judgement of one's own performance in combination with the correct judgement of the environmental conditions leads directly to taking risk and responsibility in snow sports. Snow sports can be presented as adventure sports e.g. skiing in powder snow or performing a stylish vault. Apropos style: Hereby the enjoyment of one's bodily expressions shows itself at its best. It was originally a domain of the snowboarders, but certainly not restricted to them. In modern teaching concepts the style is more and more taken into account (see Deutscher Verband für das Skilehrwesen e.V. Interski Deutschland, 2001), (German association of ski instruction and Interski Germany, 2001). Besides this, the classic formation skiing is an excellent means for enjoying bodily expression. It is a challenge to combine "stylish movements" with elements of formation skiing in choreography. Formation skiing is also an example for the cooperative aspect of snow sports. Beyond this there are a lot of situations, in which cooperation is necessary. Fallen skiers have to be helped to get up, various technical solutions can be demonstrated to one another, and sometimes one has to cope with bad weather conditions together outdoors. It is a general experience of all skiers and boarders that by carrying out snow sports together the group consciousness increases enormously. Last but not least snow sports are very impressive. Nature is immediately perceived, wind sun and cold are experienced along with a breath-taking mountain panorama into the bargain. Many senses are spoken to while gliding on snow. Not a few people are going in for snow sports because of these impressive experiences.

### 5 Interdisciplinary and cross-curricular Learning Objectives in Snow Sports Education

Having been divided in the last decades into separate subjects and fields of knowledge school education is getting more and more under pressure because of the obvious deficits of this dissected way of learning based solely on separate subjects and subject orientated teaching. "Es kann nicht Ziel der Schule der Zukunft sein, eine fachbezogene Ordnung der Lernzusammenhänge als alleiniges und zentrales Ordnungsprinzip beizubehalten. Die Nachteile sind: isolierte Wissensbestände, die entweder horizontal noch innerhalb eines Bildungsganges zusammengeführt werden, ein Übergewicht abstrakt-kognitiver gegenüber handlungsbezogen-praxis-gerechten Zielen, die Ausblendung zentraler Gegenstandsbereiche und Hinweise auf die

Überlastung mit fachlicher Obligatorik“ (Bildungskommission NRW, 1995, S.103) (Education Commission NRW, 1995, p. 103). Updated curricula developments in Germany induce therefore tendencies toward interdisciplinary and cross-curricular learning.

Snow sports activities with its main focus on skiing and snowboarding lasting several days are very well suited for interdisciplinary teaching objectives. Important topics mentioned in various new curricula such as ecological and environmental education, health and media education prove that the estimation and sustenance of an intact environment as well as the awareness and the acquisition of an adequate recreational activity are important educational objectives. Within such a framework of teaching in locations outside of the school building many different links to other subjects can be realized. Especially in this situation cross-curricular learning is of high importance and easier to perform than in normal classes (see Ministry for school, science and research of the federal state NRW, s.104).

An exemplary survey of traditional school subjects and their possible thematic relation to snow sports topics serves in the following as suggestion for the arrangement of cross-curricular projects for all years and forms of school (see figure 2).

Figure 2: Possible cooperation between “snow sports” and other subjects

<i>Subject</i>	<i>cross-curricular topics</i>
<i>foreign languages</i>	<ul style="list-style-type: none"> <li>• practising the foreign languages Italian and French at snow sports trips to Italy, France and Switzerland</li> </ul>
<i>German</i>	<ul style="list-style-type: none"> <li>• verbalizing or description of movements</li> <li>• taking minutes</li> <li>• keeping diaries</li> <li>• documenting and presenting the snow sports trip for school at home (headmaster, parents, teachers, pupils)</li> </ul>
<i>Biology</i>	<ul style="list-style-type: none"> <li>• flora and fauna in the mountains (the Alps and Low Mountains)</li> <li>• physiological effects of altitude</li> </ul>
<i>Physics</i>	<ul style="list-style-type: none"> <li>• biomechanical movement analyses in snow sports</li> <li>• kinetics: space, time, velocity, acceleration</li> <li>• dynamics: friction force, centripetal force etc.</li> </ul>
<i>Chemistry</i>	<ul style="list-style-type: none"> <li>• modern materials of snow sports equipment and winter sports clothes</li> <li>• condition of aggregation of substances</li> <li>• repairing and waxing of ski and snowboard</li> </ul>
<i>Mathematics</i>	<ul style="list-style-type: none"> <li>• vector analysis (see physics biomechanical movement analyses)</li> </ul>
<i>Geography</i>	<ul style="list-style-type: none"> <li>• environmentally compatible behaviour in the Alps</li> </ul>



<i>Subject</i>	<i>cross-curricular topics</i>
	<ul style="list-style-type: none"> <li>• alpine map knowledge</li> <li>• avalanches in the high mountains</li> <li>• meteorology</li> </ul>
<i>Politics and Economics</i>	<ul style="list-style-type: none"> <li>• significance of the winter sports tourism in the alpine region</li> </ul>
<i>History</i>	<ul style="list-style-type: none"> <li>• historical development of snow sports</li> <li>• local history of the visited region</li> </ul>
<i>Art</i>	<ul style="list-style-type: none"> <li>• creating snow figures</li> <li>• photography of downhill skiing with light of flash lamps or torches</li> <li>• creation of snow sails on sheets</li> <li>• sketching and drawing movements of snow sports</li> </ul>

Besides teaching motor skills, snow sports school trips lasting several days enable a great number of interdisciplinary and cross-curricular topics. In close cooperation with other teachers pupils shall be taught to regard their environment under many and divers angles of view.

## 6 What has to be done?

The above depicted description of the discussion has to be extended and made more precise. A scientific evaluation of the effects of snow sports trips on social competence would be desirable. Reuker (2007) could show positive changes for school trips generally and adventure orientated extra-curricular events in particular. A similar study should be also executed for snow sports trips to prove empirically the claimed and occasionally experienced effects. Snow sports trips offer unique and outstanding possibilities of a pedagogical education by and for sports. An adequate substantiation und presentation of the problem will be the future task of the ASH.