

ALPINE SKIING



TEACHING PROGRAMME FNASI / Vuokatti Sports Institute 2012

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1. Introduction

Teaching and learning snow sports is rewarding in many ways. The processes of teaching and learning pose new challenges to both instructor and learner, encompassing learning opportunities not only for the learner but for the instructor alike. The Finnish way of teaching snow sports is targeted at realizing joyful learning opportunities and happy moments of successful learning, learning being a collective experience of both parties.

This teaching programme is based on modern conceptions of how physical skills are – and can effectively be – acquired. The focus in the learning process is on the learner, whose starting points and goals are always individual. When teaching snow sports, it is important that the focus is on the learner and on the learning process itself – and not so much on the instructor's practices. A good instructor will have a good understanding not only of learning as a phenomenon but also of the sport to be learned and of the various characteristics of its specific sport culture.

The instructor will also know how to appreciate and use the opportunities offered by the learning environment at hand. Furthermore, the instructor will be aware of and able to shape the factors affecting the learning atmosphere and student motivation. These tools can be employed by the instructor to enable the learner to achieve joy of learning and discovery in the wonderful world of snow sports. Offering a safe and dependable methods and practices for the beginning snow sports instructor, the teaching programme also serves more experienced instructors with a guideline to modern teaching methods and tactics and will also provide a set of clues and drills for a versatile learning experience. One of the leading ideas behind this teaching programme was to create a common basic guideline for teaching all snow sports in a modern Finnish way.

2. What is Alpine skiing?

Alpine skiing is a winter sport, in which the skier glides joyfully downhill playing with gravity and the elements. The various goals of the skier may include freedom of movement, joy of physical exercise, improvement of one's physical condition, collecting experiences in fresh wintry conditions, bonding with other people, and experiencing the joy of learning and discovery through physical performance.

Different skiers experience Alpine skiing in highly different and individual ways, and everyone should be free to approach Alpine skiing as they wish, on the basis of their own individual needs and desires. While skiing may mean enjoying the thrill of speed and freedom for one, someone else may be seeking the cleanest possible technical sports performance displayed with an aggressive touch, and some other skiers just enjoy skiing as something that you can do together with your friends to have a good time. According to the narrowest definition, Alpine skiing just encompasses Alpine ski racing disciplines, such as in the Alpine Skiing World Cup. Seen from a slightly wider viewpoint, modern Alpine skiing also includes freeride, or off-piste skiing, and freestyle with its sub-disciplines, including skicross, big air, slopestyle and ski halfpipe. Furthermore, it is no longer just at purpose-built ski areas that skiers practise their favourite sport today – you can see skiers in a lot of different places, such as in the back country of mountains and fells, and in urban surroundings.

From the point of view of Finnish ski instructors (FNASI), Alpine skiing presents itself as a versatile snow sport, encompassing a wide variety of different sub-disciplines varying in terms of environment and equipment. However hard skiing equipment manufacturers try to realize their marketing- or business-oriented needs to draw lines between the different sub-categories of skiing, the elements – the forces of nature – remain the same. Accordingly, a good ski instructor will constantly strive towards making use of ski properties, learning environment and external forces in an appropriate, functional and versatile way. Keeping ones perspectives open and making learning a collective process open doors for new learning experiences for instructor and learner alike.

It is of our best interest to keep an open mind for new ideas, new variants of skiing, and new kinds of equipment. Accordingly we should think of Alpine skiing in its broad sense without any unnecessary categorizations or prejudices. Using a functional technique appropriately adapted to the conditions and environment will help us achieve joyful experiences on the slopes.

Our common goal is to help our ski students, the learners, to discover the joy of Alpine skiing, either through a private learning experience or in a collective learning process, so as to make it possible to for everyone to enjoy Alpine skiing in their preferred way.

3. 3. Teaching Alpine Skiing

3.1 Learning and Teaching

Learning can be understood as accumulation of knowledge and experience in such a way that this accumulation causes a change in the individual cognitive and movement patterns. Learning, and especially motor skills learning when we are talking about Alpine skiing, can happen either consciously as guided by the goals of the instructor or those of the teaching programme (explicit learning), or unconsciously (implicit learning). In the teaching practices guided by the instructor's goals or those of the teaching programme, the instructor's tools such as instructions, demonstrations and feedback are highlighted. However, it is the learning environment itself – different slopes and snow conditions – that help the ski student to learn motor skills in an unconscious way. This kind of learning is called environment-based learning (see chapter 3.2). Let's, for example, think about a young child who is learning motor skills, such as climbing, crawling, jumping and running, in the playground without any assistance from adults. Accordingly, learning is a process that is strongly connected with the environment and the prevailing conditions.

Explicit and implicit learning are not mutually exclusive. The so-called traditional teaching methods – instructor's skiing skills, technical demonstrations, instructions and feedback – still retain their important place in ski instruction. Consequently, we can use all the methods and practices available to us in our daily work with our ski students. Choosing, or creating, a learning environment that allows unconscious learning to take place can be seen as a primary challenge – and a great opportunity – for the snowsports instructor. An appropriate learning environment not only allows learner to learn new skills unconsciously but it also enables the instructor to make effective use of the traditional teaching tools for guiding the learner along his or her learning path. In practice, this means that the instructor should first choose or arrange a suitable learning environment, and let the students start experimenting in this environment – and that the instructor should only then start giving guidance to the students individually.

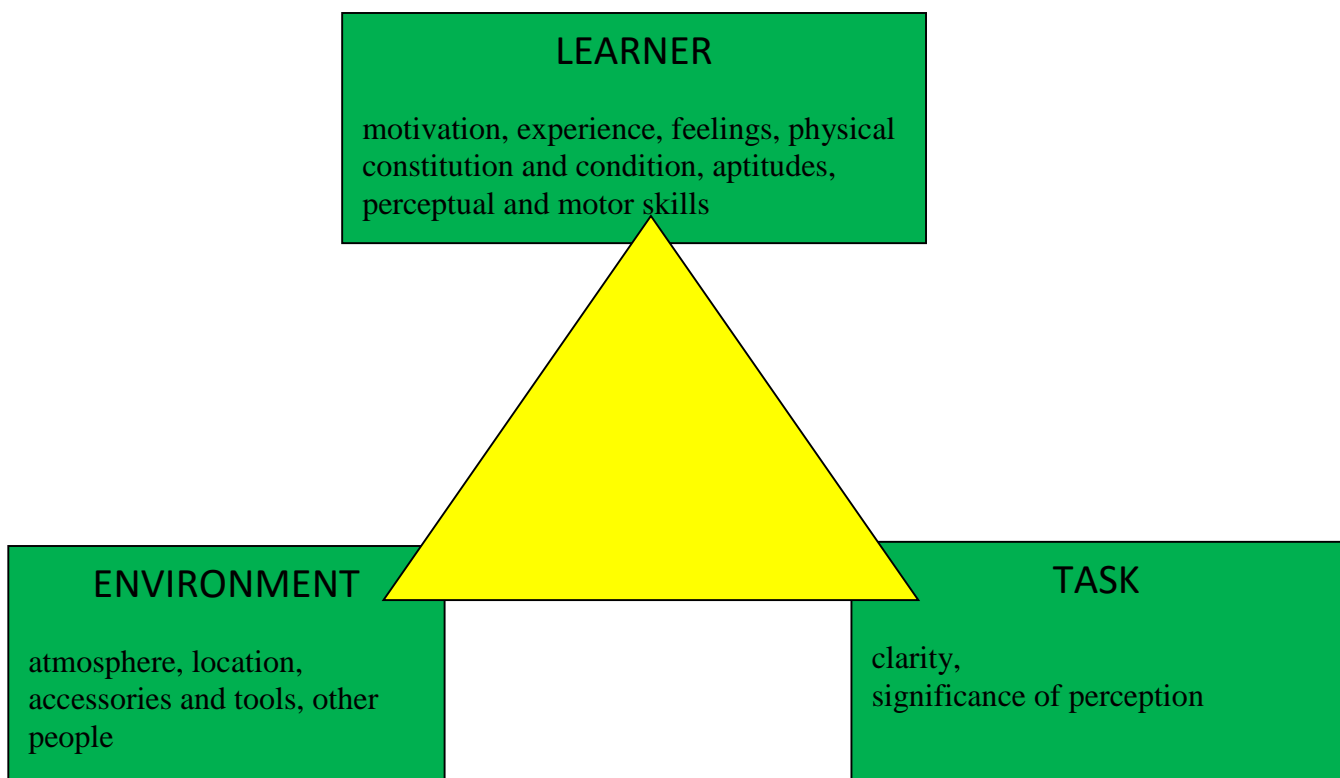
The process in which a person learns movement skills is called motor skills learning or motor learning. Motor learning is closely connected with the concepts of skill and skilfulness. The learning of skills can be defined as development in the physical performance as a result of training or action. A single successful performance that may happen by accident does not yet mean that a performance is skilful – a skilful performance can be repeated in such a way that there are only few or no poor or failed repetitions. In other words, at this stage learning has produced permanent changes in movement patterns and the movement patterns are more uniform. Another key feature of a skilful performance has to do with the ability to adapt the movement pattern to different situations, conditions and environments. A beginner skier may be able to make controlled snow plough turns on easy slopes, but will encounter difficulties in steeper terrain or in moguls. A skilful skier is able to adapt and fine-tune his or her technique in versatile conditions and in more difficult environment.

The learning of motor skills can be divided into three phases: in the *initial phase*, the skier comprehends and forms an internal image of what is going to be learned. A motor skill, or a combination of movements, such as required for a specific turn type or for a trick, can be pieced together by means of autonomous experimentation with movements, by verbal explanation, by means of a technical demonstration or by using metaphors or images.

In the intermediate learning phase the skill to be learned is trained a lot, which is something that will bind the learner's observation capacity. In other words, the learner's focus is almost 100 % on the mechanism to be learned, such as the movements required by the different phases of a turn. In this phase, it is a very challenging task to adapt the turns to the environment or to pay attention to other skiers or snowboarders on the slope.

In the automation phase the learned skill has developed into an entity, and the learner's observation capacity is set free. In the automation phase the skier can, for example, focus on the ski line on a race course, thanks to the turning technique no longer requiring all the concentration of the skier. Likewise, when arriving at the kicker the skier can focus on the movements required by the air trick instead of focusing on any specific elements involved in popping off the kicker. For the skier to be able to focus on the style of the air, the basics of jumping off a kicker will have to be in the automation phase.

Along with one's skills developing and the learning process progressing the observation capacity is gradually set free to focus also on other things outside the task to be learned. In Alpine skiing this can be regarded as a distinct goal, for the reason that skiing always takes place in a changing environment. While skiing down a slope, a halfpipe or a snow park, the skier will have to pay attention to e.g. upcoming kickers, transition, mogul, gate pole, the next trick, and to other people on the slope. It is important for the instructor to pay attention to this even in the initial phases of learning by directing the learner's attention to factors outside the learner's body, such as to the upcoming turn, a cone marking the turning point, or the edge of the slope, just to mention a few examples.



Picture: The Modern Skills Learning Model The factors connected with the Learner, the Environment and the Task are in constant interaction with each other. For example, individual physical strength or observation capacity also affect the other two factors of the triangle. A

physically strong skier with an advanced ability to assess the slope shapes and snow conditions can ski down even a challenging slope with relatively small power input by making use of slope shapes. Good perception skills help the skier anticipate and prepare for the following turns, and thanks to physical strength the physical challenges of the run will not disturb the skier's focus on the essential things on his or her way down.

Along with the development and new findings in the research field of how human beings learn, also the role of the instructor in the teaching situation has changed. We have moved from teacher-centred teaching methods more and more towards student-centred teaching practices, in which the role of the instructor is primarily that of a learning guide or facilitator. What is essential in this ideology is that the focus is not so much on the instructor or on his or her activities but on the learner and on the learning process itself. In case the instructor is too much focused on matters related to teaching techniques or methods, or on the preconceived lesson plan, there is a risk that the concentration moves away from the student. It is essential to keep in mind that a lot of the learning – and also teaching – takes place through experimenting with different things, and also through trial and error. Consequently, teaching should not so much consist of doing away with problems or errors in technique, but rather of encouraging and supporting the learner to experiment with different ideas and to try out new things.

The instructor should consider the following factors when pursuing his or her activities as a snowsports instructor: supporting student's motivation, 2.) maximizing the amount of activity, 3.) creating or choosing an appropriate and inspiring learning environment, 4.) progressing in a logical progressive way 5.) training complete movement patterns.

1. 1. Supporting student's motivation

One of the fundamentals of good modern teaching for the instructor is to arouse the student's attention and to boost their will to learn. Optimally, the instructor is capable of creating enthusiasm in the student for the learning activities – thus strengthening student's internal motivation. Good internal motivation makes the student to actively participate in the learning activities. This being the case, the student is motivated by the joy and positive experiences created by the learning activities. External motivation, contrarily to the above, derives from reward on desired performance and fear of punishment. External motivation for learning usually ceases to exist when reward is achieved or when punishment cannot any longer be expected.

Internal motivation should be supported in snowsports instruction for the reason that it is the strongest form of motivation. Internal motivation is strengthened by the student being able to have the sense of autonomy, competence and belonging to a social group during the learning activities. Autonomy refers to the student feeling that they can make choices regarding their learning activities, and being involved in the planning the learning session. Autonomy has a key role in the creation of internal motivation, and it is essential for the students to be able to influence the choices that affect them.

The sense of belonging to a social group refers to the students feeling that they are part of the group and that they are accepted as group members. The group or club can thus be seen as a magnetizing factor making the learner to participate in the learning or training activities repeatedly. The responsibility for the other members in terms of safety is another strong factor bonding the group together and strengthening the sense of social belonging.

Competence refers to the how much confidence the learner has for their own abilities and capacities. When the students have successful learning experiences and receive positive feedback, their sense of competence is strengthened. Tasks and tricks that fit the student's skill level, the sense of doing well during the training together with encouraging feedback are the keys to enhancing the sense of competence.

Internal motivation can be supported not only through teaching arrangements but also by creating a learning environment that furthers the sense of autonomy, social belonging and competence – in other words, a positive motivation climate. The term motivation climate refers to the student's experience of the atmosphere, or ambience, during the learning session. The learning atmosphere can be task- or competition-oriented. In a task-oriented atmosphere the instructor supports, encourages and promotes factors that boost autonomy, social belonging and competence. This is likely to create a favourable learning atmosphere that will boost the motivation of the students. In contrast, if the teaching tactics and methods fail to support the student's autonomy, belonging and competence, the learning atmosphere is likely to be competitive, which in turn makes the motivation more external.

The table below presents the factors affecting task- and competition-driven motivation climate.

Learning Atmosphere		
	Competition-oriented	Task-oriented
Task / Resources	Equal to all participants	Differentiated or individualized according to students' skills and desires
Authority/ Role of instructor	Controlling	Highlighting the responsibility and learning options of each group member
Rewarding	public, normative, based on competitive success	individual, based on individual development and effort
Individualizing, personalizing	competition-oriented tasks	individual / collective tasks
Assessment	Normative and public; focusing on results; Punishment on errors; Mutual competition valued and encouraged	Based on individual progress; Focus on development and learning; Errors are regarded as part of learning process; Cooperation and collective action are valued and encouraged
Use of time	Limited time for specific tasks	Flexible time for learning

2. Maximizing the amount of activity

Motor skill can only be learned by doing things actively and training. Accordingly, the instructor should use as little time as possible or necessary for giving instructions, giving demonstrations, moving the group from one place to another and things like these. Each learner experiences learning in their individual ways, which is why the instructor should place the main emphasis of his or her activities on creating or shaping the learning environment, and not so much on the technical things related to the sport being learned (see chapters 3.2 and 3.4.3). In other words, it is the environment that enables not only one but a number of different learning opportunities and movement solutions for the learner. It is essential that instead of giving ready-made solutions the instructor should encourage the learner to autonomously resolve movement tasks and to discover things, in addition to giving the student time and opportunities for experimenting with different ideas and solutions. We might call this an open learning framework.

3. Creating an efficient learning environment

The instructor can create an effective learning environment by using concrete teaching aids to enhance the learning process. Teaching aids are tools that facilitate learning, such as obstacles, gates, ropes, tracks and courses made from gate poles, ski sticks, cones etc. These tools are used for giving inspiration and guiding the student in a good direction in the process of learning new skills (see chapter 3.4.3 and the drill database → examples of the use of teaching aids). For example, when learning how to pop off a kicker, we can make the student to hop over an obstacle (e.g. a gate pole placed across the hill), or we can use cones or stubbies to adjust the shape and radius of turns. The teaching aids create images in the student's mind and free the instructor from the traditional instructor role thus allowing more time for guiding the learning process. The use of teaching aids helps create a more efficient learning environment thanks to them making learning easier, inspiring the learner to act and react in a spontaneous way as well bringing variation to training. In addition, teaching tools enable differentiating the learning process, allowing different tasks for different skill levels.

4. Logical progression

All sports and motor skills, such as Alpine skiing, a specific turn type or trick, contain some elements that are more central for the learning process. It is essential for the instructor to have adequate knowledge of the central elements in the skills being learned. The central elements should be in the focus of the learning process. The position or movements of the hands and arms can, for example, be considered less important than the interplay of the ankles, knees, hip and the whole body, for example. Likewise, when preparing for a freestyle trick, e.g. for spinning in the air, it is more essential to focus on the timing of take-off and body rotation instead of thinking about knee position. It is important to think about the key elements of the thing to be learned whatever the skill level of the student. A practical implication of this is that a versatile training of basic skills should be continued appropriately through all skill levels. A skilled learner will also quickly perceive and comprehend what is essential in any given task.

5. Training complete movement patterns

In teaching Alpine skiing, it is possible to train complete movement patterns from the very beginning. This can be done simply by moving about on gliding skis in different ways in various settings and in different conditions. At the initial stages of skills learning, it is advisable to train complete movement patterns as simplified and easy versions, so as to adjust them to

the student's skill level. This allows for retaining the same basic idea of the movement pattern also in later learning phases. Learning complete movement patterns instead of partial skills can be recommended as it makes the learning goal concrete and easy to understand.

Ski instructors often face situations where the student is not learning in spite of instructor' demonstrations. To help us to understand and to accept this, we need to be aware of how the human body works when we move about. This will also help the instructor to find effective drills and functional ways of teaching and how to support the student's learning process.

When moving about, the human body (extremities, joints and muscles) get automatically organized to face the tasks and challenges posed by our goals and the environment. We are referring to motor coordination and coordinated movements here. Our extremities, limbs (lever arms) and joints that are involved in our movements represent the so-called degrees of freedom (DOF's). The total of DOF's in a movement is constituted by the number of joints and movement directions involved in it. In Alpine skiing we actively use all our joints (we also use our shoulders and arm joints when making a pole plant, for example). The directions of movement are vertical (up-and-down), fore-aft (forward-backward), lateral (side-to-side) (See pressure control and edging, chapter 3.3) and rotary (turning movements, chapter 3.3.), and combinations of these. One's skill level reveals how efficiently one's body is capable of organizing itself for completing a movement task. A beginner will "freeze" or reduce a number of DOF's by stiffening the musculature in order to have tight control, which can be seen as stiffness in the performance (e.g., stiff ankles or knees). Along with learning and as the task becomes more comfortable, the learner gradually "loosens up" and explores the available DOFs, and from there finds more optimal solutions, which can be seen as improved motor coordination and more fluent combined movements. Examples of such combined or aggregate movements are, e.g., the coordination of ankle, knee and hip movements in a turn or the timing of the pop-off and body rotation when preparing for a spin at a kicker. A skilled skier or rider is thus capable of making use of the environment to enhance their performance, e.g., through selecting an optimal line to gain more speed in a half-pipe or on a ski cross course.

3.2 Learning environment

In addition to skiing down on smooth and even slopes, the skier will face a wide range of different slope shapes and snow conditions. To be able to make use of the environment and different terrain shapes in a versatile and creative way can be seen as an essential skill in Alpine skiing. Consequently, selecting or creating a learning environment that helps to learn the basic skills (see Chapter 3.3) can be seen as an important element of learning from the very beginning. The learning environment is a combination of the physical, psychic and social factors affecting learning and teaching. Student's skill level and motivation, instructor's competence, communication between student and instructor, weather conditions, slope and snow conditions, traffic on the slopes and student's level of activity are all essential elements of the learning environment, and should be considered also in the choice of the physical learning environment. In a broad sense, the learning environment can thus be described as the reality in which the student and the instructor operate. This chapter primarily deals with the physical learning environment in which the learning takes place, and gives guidance on how to

select and shape the learning environment.

At the start of the learning session, a learning path or learning target options are worked out by the student and the instructor together so as to optimally support and develop the student's skills on the basis of the current skill level. The selected options shall include drills and exercises in different learning environments suitable to the student's skill level. The instructor is also advised to pay attention to and to discuss safety-related issues as they naturally present themselves along with the learning process. This is likely to enhance the feelings of safety and competence with the student, thus also boosting the motivation for learning and training.

It has traditionally been thought that the better mastery of the discipline the instructor has, the better instructor he or she is. While it is important to have a sound know-how of the sport, the targets and goals set for instructor's activities do, however, change when we start to consider how the instructor should also be capable of creating and shaping different learning environments specifically for the learner so as to improve and enhance the learner's learning process and skills. Every single turn that we make on any given slope will be different, as our turns are affected not only by the progress in our skills but also by the speed, weather conditions, slope shapes and other variables that are prone to change from turn to turn. In teaching motor skills, such as skiing, it is essential to teach your students how to handle different conditions and situations. The traditional instructor-centred teaching method, which aims at the right or "perfect technique" and is focused on correcting mistakes, is, unfortunately not very well suited to guiding the student to act in a functional way in real or genuine situations. Learning through environmental exposure, in contrast, serves for variation in training and prepares the student for facing the variable challenges posed by the constantly changing environmental factors. While the basic principles of motor performance remain the same, each run and turn will turn out slightly different.

The varying learning environments will enhance the student's conception of their learning styles, skills and capabilities. Problem solving situations deliberately introduced by the instructor play an important role in learning. The learner is thus involved in the problem solving process, which will enhance the learning process. In other words, one learns through being exposed to various environmental factors. This approach to the learning environment based on modern conceptions of learning is essential in teaching Alpine skiing due to the fact that ski equipment can be seen as a challenging tool and also for the reason that the environment plays a major role in the learning process.

The beginner will regard skis as a difficult and exciting means of locomotion. This fact highlights the necessity of good planning and functional learning environment. An unsuitable learning environment will create too much stress and tension which will distract the student's attention from the subject to be learnt. A suitable learning environment will also prevent the students from getting scared, which could undermine the learning process. A functional learning environment will also allow for safe learning and efficient use of time for learning. A versatile or new learning environment can offer new challenges also to an advanced student, thus allowing the student to enhance their basic skills in new areas. The tasks of the instructor include encouraging the student to experiment with new things in different situations and conditions. The basic idea is to develop and enhance the basic skills to support the learning process or to reach a given learning target. A key outcome will often be a stronger student motivation to autonomous skills development and to skiing in general.



Picture: Each ski area encompasses a range of different learning environments.

Finnish ski areas offer versatile opportunities for teaching and learning Alpine skiing. The instructor can make use of a range of different learning environments to support the student's learning process. Easy, medium and steep slopes, a fun park, a children's area and even snow fields can be found at most ski areas. It is, however, only the instructor's imagination that sets the limits for creating or selecting functional learning environments. In addition, the instructor can set variable tasks and tasks with different levels of difficulty, use various teaching aids for shaping the given learning environment, e.g. by using cones, ropes or create different snow shapes with a spade. Even the smallest changes to the learning environment may have a decisive influence on student's and instructor's activity. The shaping of the learning environment can also be used as teaching aid (see Chapter 3.4.3), e.g., in teaching heterogeneous groups. The instructor can create different levels of difficulty in the teaching environment, which allows students of different levels to proceed in a safe way and highly motivated as they can select their tasks autonomously and according to their own skill level.

The physical learning environment can thus be seen above all as a tool for creating challenge, possibilities and variation for learning. Used in a functional way and adapted to the student's needs the learning environment can be a powerful motivator, and its possibilities are only limited by the instructor's creativity and imagination. The choice of learning environment will optimally be made jointly by the student and the instructor. It is of utmost importance for the student to cope well with the given tasks and to feel competent in the learning process. A student that is faring well and feels competent and accepted will also experience a strong desire to learn more.

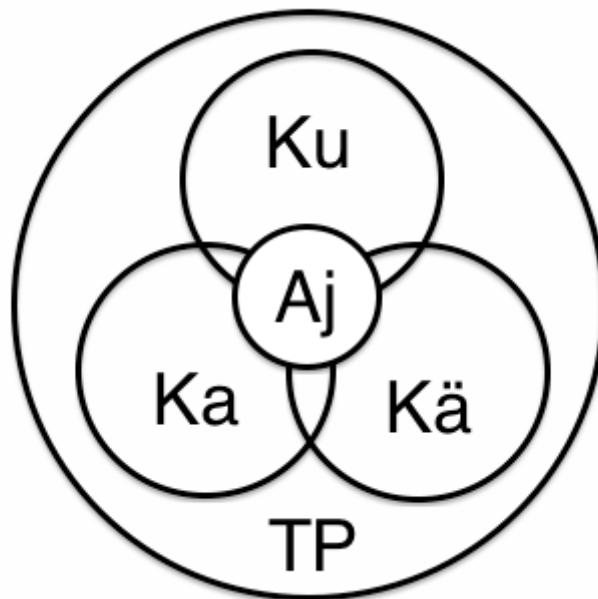
How to select an appropriate learning environment?

Who makes the choice of the learning environment?

How can you shape the learning environment to adapt it to activity and skill level of the student?

3.3 The basic skills in Alpine skiing

As a theoretical basis for this teaching programme, Alpine skiing can be broken down into five basic skills: balance, turning movements, edging, pressure control and timing. All skiers will, regardless of their skill level, conditions or the given task, combine these basic skills in their skiing. How much the different basic skills are emphasized and how important they are in the different Alpine skiing disciplines varies greatly. Versatile training in varying conditions, environments and with different kinds of skiing equipment will create a sound basis for developing the basic skills and the adeptness of the skier's in different conditions.



Picture: The basic skills of Alpine skiing Balance forms the basis for all the other skills. Timing combines turning movements, edging and pressure control into a functional flow of movements in skiing.

The basic skills are used in all the different sub-disciplines of Alpine skiing, such as gate racing, free skiing and freestyle, while their relative importance and specific features may show quite remarkable differences. While narrow-focus training may help to develop a specific aspects of skiing skills, it will delimit the possibilities of developing versatile skiing skills. Accordingly, the instructor can be advised to guide, challenge and encourage the student to experiment with different learning paths, learning environments and drills.

3.3.1 Balance

Balance forms the basis for all kinds of skiing and makes it possible to train the other basic skills in a versatile way.

Balance can be divided into static and dynamic balance. Static balance refers to the ability of the skier to maintain balance on a stationary area of support and by using minimal movements, e.g., when standing on one's skis on a flat place. Dynamic balance, for its part, refers to one's capacity of performing movements on an unstable area of support and in

varying conditions. Dynamic balance can thus be seen as continuous movements adapted to the flow of the turns in skiing. Maintaining balance and reacting to the constantly changing conditions is made possible through adopting a stable ready-to-move position.



Picture: Side view of a functional ready-to-move basic position. The majority of the skier's weight rests on the balls of the feet and also on the whole foot and slightly on the boot tongues. The back is rounded up slightly and the arms and hands are kept on the sides and slightly in front of the body.



Picture: Front view of a functional ready-to-move basic position.

In a functional ready-to-move basic position the skier will be standing on their skis in a relaxed way and so that the main joints of the legs are slightly flexed. The skis are kept in a hip-wide position. When making dynamic turns at a relatively high speed the majority of pressure should be kept on the balls of the feet. This position allows the skier to quickly react to changing conditions. The skier should stand in their boots in an active way, feeling the boot tongue against their lower leg while not leaning against them too much. In easier conditions, in lower speeds, in the off-piste and when performing tricks the weight should be more evenly distributed over the whole foot.

Maintain a relatively high hip position, and bend forward slightly at the waist. The hands and arms should be kept on the sides and slightly in front of the body. Focus your eyes on where you want to go, forward or down the hill. A ready-to-move basic position enables mobility in all directions of movement - up and down, side to side and fore-aft, which enables moving one's centre of gravity according to what is required by the given situation or task.

Maintaining a ready position does not, however, mean that one should keep one's body static at all times. The basic position will optimally be adapted to the given situation in such a way that allows controlling and moving the centre of gravity appropriately in view of the given turn or trick. The ready position allows the skier to make movements in all the necessary directions, and it constitutes an ergonomic and efficient starting point for reacting to any challenges faced during the trick or the run down.



Image 2 The ready-to-move position is adapted to sliding on a dance floor. The hands and arms are kept more on the sides of the body to improve balance.



Image 2: Rather than being a static position, the ready position is constantly adapted to the flow of movements.

3.3.2 Edging

The goal of edging movements is to form an angle between the ski and the snow surface, so as to enable the skier to control the edge grip on the snow. In addition, the edging movements help the skier to move the centre of mass towards the inside of the turn. These two factors also affect the radius of the turn.

Even though the ankle musculature plays a part in edging, the structure of the ski boot largely delimits the range of ankle movements. Edging movements are regulated by angulation movements at the ankle the knee and the hip joints. Inclination of the whole of the body into the turn is also used for angulation in medium and higher speeds.

In principle, edging will take place whenever the skier makes a turn or aims at the ski edges gripping the snow. Edge control is also needed for sliding sideways on a rail. Edging movements remain more or less the same in different situations, while their volume and timing will vary depending on speed, turn radius and other factors affecting the skier.



Image: The skier has made the skis to change direction and grip the snow by weighting and edging them. In the process he has also moved his centre of mass towards the inside of the turn, thus creating a strong kinetic chain between the centre of mass, the knee and the outside ski.



Image: The snowplow enables a large area of support, which facilitates maintaining balance. By opening the skis into a wedge the skier also allows for the knees to move towards each other, which will bring the skis more onto their inside edges. The snowplow allows turns to be made easily just by changing weight from one ski onto the other, without making an edge change.

3.3.3 Pressure control

Weighting or pressure control refers either to a passive weighting of skis by making use of external forces or to active weighting or pressurizing the skis against the snow through the movements made by the skier. Essentially, active muscle tension, making use of external forces and resisting them are all required to effectively control how the ski tracks or behaves on the snow. Weighting the outside ski is a key element in functional skiing.

To control the pressure on the ski, the skier can shift weight along the length of the ski, move up or down and from side to side. These actions are also referred to as weight shift movements. The flexion and extension of the legs (like the shock absorbers of a motor vehicle) can be used to regulate the pressure between the ski and the snow surface.

Combined with edging, weighting makes the ski to bend, which will lead to a smaller turn radius. Quick changes of ski pressure can be used to make jumps or hops between turns. The higher the speed, and the more challenging the turn radiuses, conditions or the equipment are, the more important it will be to be able to regulate ski pressure precisely and with appropriate timing.



Image: The shapes of the slope also affect the pressure between the skis and the snow. The pressure will increase in the compression when approaching the top of the mound, and decrease after the mound top. An active pressure control requires for the skier to actively use muscle tension, as well as the extension and flexion of the legs.



Image: Extreme weight shift along the length of the ski. Nose wheelie (on the left) and tail wheelie (on the right)

3.3.4 Turning movements

Turning movements refer to the rotary or turning movements of the skis and/or of the skier's body. Slipping turns or different tricks, for example, involve a lot of turning of the skis in relation to the vertical axis of the body, while this movement is relatively limited in long carving turns. A separation of upper and lower body, i.e. the skis and the upper body turning in opposed directions, may also happen in various tricks, turn types and in specific conditions.

Upper body control, including the hip, has a great importance in functional skiing and in performing tricks. The skier uses upper body movements to make their centre of mass to move in a desired direction and to help resist the forces produced by the turn or trick. The rotary movement of the upper body in turn direction is called 'rotation' and the movement in opposed direction is referred to as 'counter rotation'.

Appropriate counter rotation movements are an essential part of functional skiing. Combined with edging movements, especially with the hip movement, the counter rotation enables the skier to move the centre of mass towards the inside of the turn, which enables making use of momentum to make the ski track well in the snow. Counter rotation can also be used in different tricks to prevent overspinning, for example. (See also the image in Edging)



Image: Counter rotation After turning the skis sideways the skier maintains balance by making a small counter rotation in the upper body.

3.3.5 Timing

A successful trick or turn requires combining basic skills in a fluent flow of movements, and performing appropriate movements at the right time.

A turn can be split into two main phases: the initial phase and the end phase. An air trick, for its part, can be divided into approach, take-off, air and landing phases. The different phases of a turn or trick require different movements depending on what the skier is aiming at.

The timing within a turn does not only affect the turn itself but also the following turns and how the turns are linked together. It is thus advisable to think upon a ski run not so much as a series of individual turns but rather as a series of linked turns, where each turn affect the following turns.

A skilful skier will be capable of controlling the rhythm of their turns to keep it constant or to change the rhythm of the turns appropriately so as to adapt it to the conditions or slope shapes. Snow and weather conditions, different slope shapes, obstacles and equipment characteristics are factors that the skier will have to adapt and react to by making changes to the rhythm of the turns.





Image: Timing A good timing of take-off and body rotation is required for performing a 180 spin in the air.

3.4 Teaching and learning paths

A teaching path can be seen as a logical progression of learning and developing the basic skills of Alpine skiing. The basic skills are applied in all skiing, equally well in sliding on rails and making big airs, as also in half-pipe skiing, ski racing and free skiing on prepared slopes and freeriding in big mountains. Student's interest in the different fields of skiing along with their skill level, physical condition and other background will have to be considered when selecting an appropriate learning path for the student. A good choice of learning path and learning environment will have a decisive importance on the student's motivation, either boosting or undermining it. If the slope is too steep for a beginner, for example, the student will be just too frightened to be able to learn anything, which is likely to weaken the motivation, or even kill it in the end. However, braving oneself to face thrilling challenges or endeavouring into new areas and exciting environments, as in skiing down a steep slope, performing a new trick or taking air off a kicker, may very well be the best thing that skiing has to offer.

A learning path can thus be regarded as a way of teaching, or as an initial plan or framework for progressing in learning and carrying out the instruction task. The main focus of instruction is on the learning process, and not on teaching. Essentially, the instructor will have to be capable of assessing the skill level and performance of the student and be able to adopt teaching methods and tactics to the student or group at hand and to do this appropriately for the situation and prevailing conditions. A full involvement in the teaching situation is required from the instructor. Genuine listening and fluent communication are also essential to allow the instructor to find out about the student's background, interests and personal goals. As the main responsibility for the health of the student and for the execution of teaching process lie with the the instructor, the guiding of the learning process will require a high degree of professionalism. The choice of the learning path for a teaching session is optimally made by student and instructor together.

The learning capacity and interests of the student vary widely, depending on age, courage, physical characteristics and earlier experiences with skiing and other sports. A skilled instructor will be able to find out about these factors, assess student's performance and adopt the learning path accordingly and proceed along it at a convenient pace. There is no single "patent solution" that would suit all learners equally, but rather the teaching process and the teaching path will optimally be individually suited to each student, to the situation at hand and to prevailing conditions separately. Along with accumulated teaching experience, the capacity of the instructor to find working solutions to different situations will also improve. An open and unbiased mind and the will to try out new things and tools is essential also for the more experienced instructor. While it can be recommended for the instructor to make use of a set of proven teaching tools, is equally important not to get overly fixed to using these, but to keep looking around for new ideas, drills and teaching aids to complement your tool set.

Each instructor will have their own special interests within skiing. While someone will prefer the backcountry, others may find it thrilling to shred rails in urban environments. These interest will also most often be our strong teaching areas. However, one should also keep in mind that our interests do not necessarily match those of our students. The interests of the student should form the starting point for setting the targets for the teaching session as well as for the choice of learning environments and drills.

The teaching paths presented in the following are to be considered just as examples of how the teaching can be organized. While these learning paths may be used effectively as such in some cases, it is more essential for the instructor to remember that the starting point for the planning of teaching should always be the student, paying attention to the individual needs, targets, background and capabilities. In practise this means that the teaching sessions will

always turn out different as a successful session will always be a combination of different learning paths, teaching methods. In addition, new drills and ways of motivating students are often invented or experimented with during teaching sessions.

A fresh instructor will find lots of challenge in any teaching situation, and each teaching sessions will teach the instructor new things. For this reason, proven teaching paths or methods will support the instructor at the beginning of their teaching career and help the newcomer instructor to gather experience in teaching in a safe way. The teaching paths presented in the teaching programme can be thought of as a starting point for gathering experiences, on the basis of which the instructor will learn to adapt the teaching programme in a appropriate way and to select functional tools for different kinds of learners and situations.

When preparing a teaching path, the instructor should consider the factors affecting student's motivation:

- the student feels being able to cope with the tasks given and feels competent in view of their level or starting point
- the student experiences being accepted as a member of the group and gets a feeling of bonding with the group – or with the instructor
- the student feels that they can influence on the content or progression of the session or on how learning or practising is carried out for their part.

A motivating and inspiring teaching session will most often not be restricted to only one of the teaching paths, but rather includes elements from all the three teaching paths. Efficient teaching often has to do with combining different teaching paths and methods in a way suitable to the situation and conditions. The focus of the instructor should be on the student when making these choices. In view of student's motivation it is important that the student feels competent, accepted by other group members and being able to participate in the planning and process of the session.

In a nutshell, the teaching paths can be viewed as frameworks including different elements that can be used for creating an individual teaching path for the student. A teaching path can thus be used as an initial plan setting the guidelines for the teaching session, and the path can be adapted according to the interests and motivation of the student, the progress they make, and also depending on the prevailing conditions.

3.4.1. Traditional path

The traditional teaching path is based on teaching basic skills in a progressive way from easy to more challenging slope conditions. The traditional path is focused on making turns on normal prepared slopes, which can be regarded as traditional skiing. The process of developing basic skills is first focused on enhancing individual basic skills and then combining them in slow-speed skiing and finally in faster turns and more challenging conditions. The normal prepared slopes within a ski area will serve as the learning environment for the traditional teaching path. The choice of the learning environment will optimally be made by student and instructor together according to the skill level and learning targets.

3.4.2. Freestyle path

The freestyle path is focused on training and enhancing the basic skills by making use of different tricks and elements from freestyle skiing. These can be adapted to the student's skill level in different environments such as on normal slopes, in fun parks, in half-pipes and on press boxes. Different turns and switch skiing (skiing backwards) are also included in this path. The same basic skills are used in all kinds of skiing, which is why also performing different tricks will also enhance the skills needed in making turns, and vice versa.

Today, freestyle can be seen as an integral part of Alpine skiing, which makes it all the more important for the instructor to integrate freestyle elements in teaching. The freestyle path underlines the image of skiing as a free and creative sport, which makes it interesting especially for younger people.

3.4.3. Teaching aids path

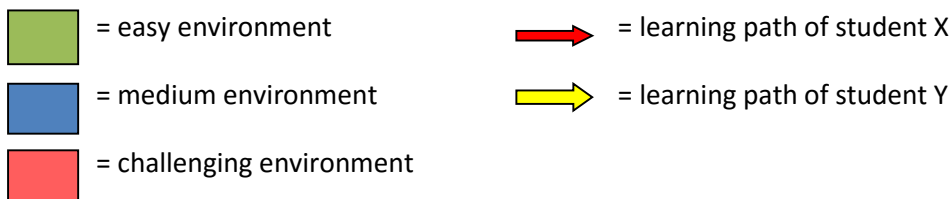
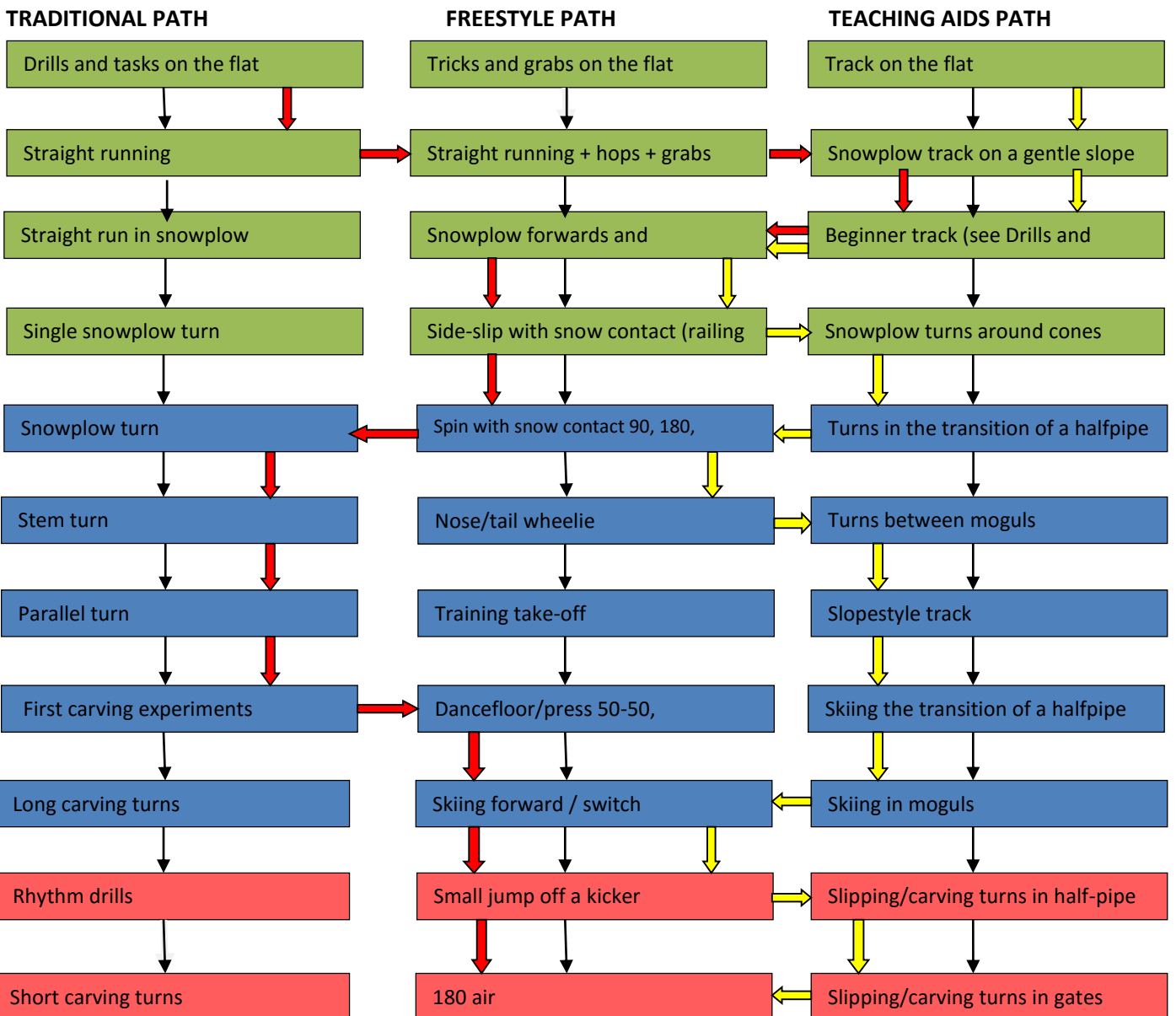
The teaching aids path is based on learning skills through different learning tools and through environmental exposure. A central element of this path relies on the instructor's skill to shape the learning environment by using different teaching aids or learning tools, such as cones, to guide the student towards the given learning target. A factor or tool used for shaping and guiding the learning process is called a teaching aid. Tracks made of ski sticks, cones or stubbies, obstacles, gates, and different shapes made of snow can be made use of as teaching aids. (see Drills and exercises → for additional examples for teaching aids)

Different slope and terrain shapes found at the ski area can also be used as teaching aids, as well as slopes with different gradients, knolls, kickers, half-pipes and press boxes, for example. While the different learning environments will help the student to learn new things just by the student exploring these environments and teaching aids and experimenting with different things, the learning process will be enhanced when the student is guided by the instructor in selecting suitable learning environments on the basis of the individual skill level and according to student's desires and learning targets. In addition to enabling the maximising the amount of physical activity, teaching aids can be used for differentiating and individualizing the learning process, thus enhancing the efficiency of the learning environment.

Traditional motor skills training has been more or less targeted at a "perfect technique". However, as soon as one can accept the fact that each situation, realization of skill and performance will be different, one will also realize that there is no such thing as "perfect technique". Every single turn that we make on any given slope will be different, as our turns are affected not only by the progress in our skills but also by the speed, weather conditions, slope shapes and other variables that are prone to change from turn to turn. In teaching motor skills, such as skiing, it is essential to teach your students how to handle different conditions and situations. The traditional instructor-centred teaching method, which aims at the right or

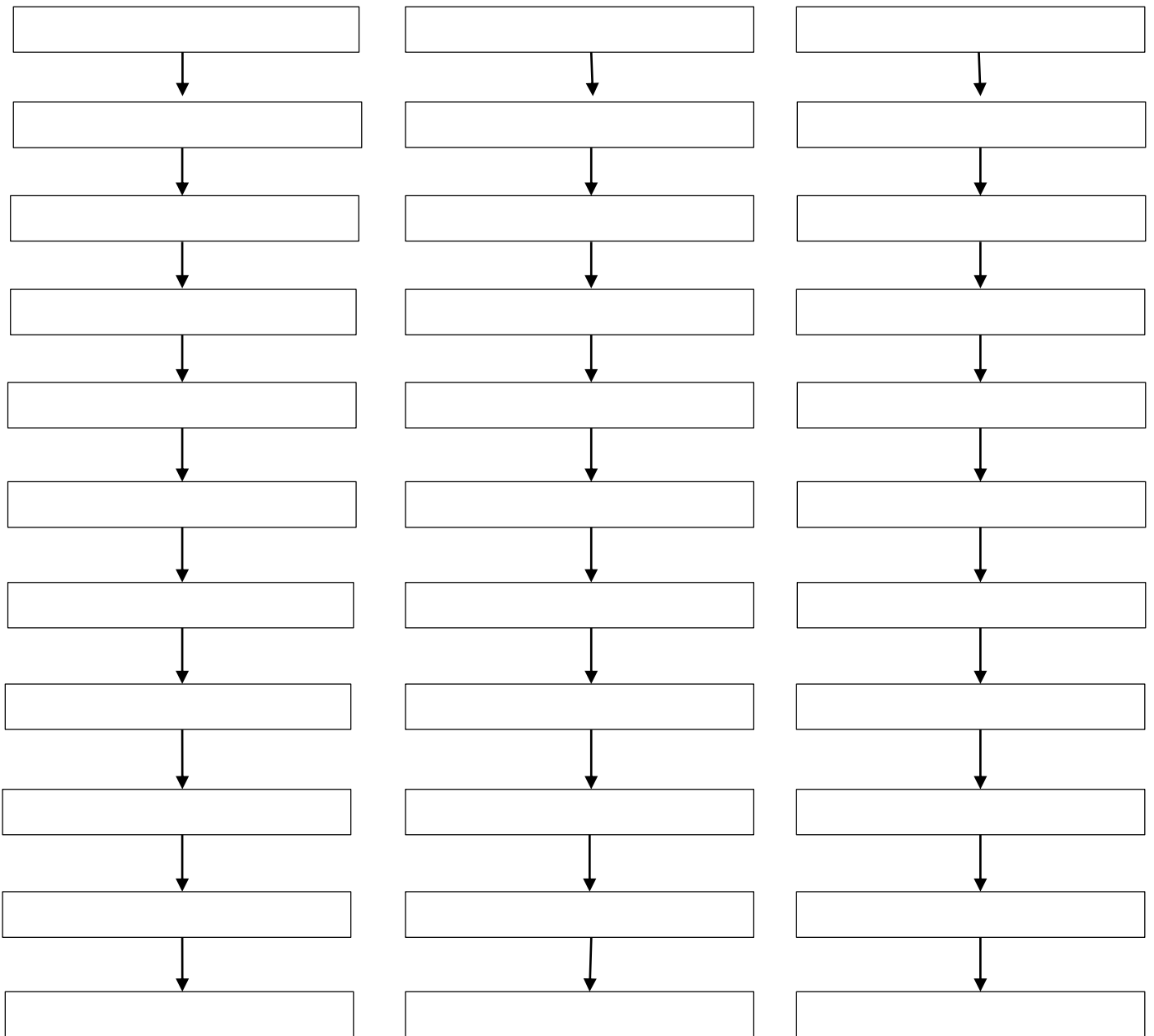
"perfect technique" and is focused on correcting mistakes, is, in the end, not very well suited to guiding the student to act in a functional way in real or genuine situations due to the fact that the learning process is highly dependent on the circumstances and conditions of the learning environment. Learning through environmental exposure, in contrast, serves for variation in training and prepares the student for facing the variable challenges posed by the constantly changing environmental factors. While the basic principles of the performance remain constant, each performance or practical realization of technique will be different.

3.3.4 Examples of teaching and learning paths



The learning paths presented in the image are examples of logical and progressive teaching processes. It will not be advisable to restrict the learning to one of the theoretical learning paths only, but rather the teaching should be individually adopted to the characteristics and skills of the student. In other words, each student should be guided along own individual learning paths. The instructor can, for example, use the traditional learning path as a starting point, and then use elements of the freestyle path and teaching aids path to enrich the learning process (red arrow). Whichever path you choose to start with, the learning should always start in an easy environment on the flat. As the student's skills start to improve you can gradually move to more challenging environments and conditions paying attention to student's goals and prevailing conditions. When starting to learn challenging techniques or skills, you can always return to easy environments (e.g., to experiment with the first carving drills on a gentle wide open slope). Moving towards more challenging environments can thus be seen not so much as a goal in itself but rather as a natural way of progressing along the learning path.

3.4.5 Your own individual teaching paths



Make a note of the different teaching paths used during instructor course

Essential issues in ski instruction

- Create and keep up student's motivation
- Maximize the amount of physical activity
- Create and shape an efficient learning environment
- Progress in a logical way
- Train complete movement patterns

4. Drills and Exercises

Opettajan tehtävänä on huolehtia oppimisympäristön ja harjoitteiden sopivuudesta oppilaille ja toisaalta luoda näillä tekijöillä monipuolisuutta ja mielekkyyttä harjoitteluun. Oppilaan tulisi kuitenkin kokea, että myös hän saa itse vaikuttaa suunnitteluun ja harjoittelun valintaan. Oppiminen on aina tilannesidonnaista ja siksi myös harjoittelun tulisi ottaa tilanteiden vaihtelu huomioon. Vaihtelu on taitoharjoittelussa avainsana!

Harjoittelun muuntelu on usein oppimista edistävä tekijä ja tehtäviä voidaan muunnella jo aivan taidon oppimisen alkuvaiheesta lähtien. Oleellista on keskittyä kokonaissuorituksen harjoitteluun. Erilaiset oppimistilanteet auttavat löytämään liikettä sääteleviä tekijöitä ja harjoittelun monipuolisuus lisää oppilaiden motivaatiota sekä antaa opettajalle tietoa oppimisen edistymisestä.

Oppimiseen vaikuttaa harjoittelun määrä, mutta myös vaihtelun määrä. Liikkeen toistaminen aivottomasti ei kehitä taitoa tarkoituksenmukaisesti, eikä liike tallennu tällöin tehokkaasti. Kun liikettä joutuu koko ajan työstämään, tallentuu sen paremmin muistiin. Perustaitoja harjoitellaan monipuolisesti erilaisissa ympäristöissä, jolloin taidon siirtovaikutusta voidaan lisätä monipuolistamalla ärsykeitä. Näin oppilas oppii malleja siitä, miten taitoa tulisi muuttaa erilaisia vaatimuksia vastaavaksi. Oppilas osaa näin siis siirtää opitut asiat toiseen samantyyppiseen tilanteeseen tai erilaiseen ympäristöön sekä soveltaa opittua erilaisessa tilanteessa.

Perustaidot ovat tyypillisesti taitoja, joita muunnellaan tehtävän ja tilanteen mukaan. Siksi niitä kannattaa myös harjoitella muunnellen olosuhteita ja harjoittelemalla monipuolisesti. Esimerkiksi aurakäännöksen voi kokeilla ensin loivassa rinteessä hitaassa vauhdissa, jonka jälkeen se voidaan laskea eri rinteissä tai erilaisessa lumessa. Seuraavaksi voi mennä kartioradalle ja lopuksi käännöksen voi tehdä kavereiden kanssa yhtä aikaa. Konsteja harjoittelun monipuolistamiseen voivat olla nopeuden lisääminen, käännöksen säteen tai rytmin tiukentaminen tai itse tehtävän monimutkaistaminen.

Harjoituksen voi tehdä esimerkiksi eri suuntiin: etuperin, takaperin, oikealle, vasemmalle tai viistoon. Liikkeen taso voi olla korkea, matala tai keskitaso. Harjoituksen tilaa voi rajoittaa kapeaksi tai harjoituksen voi tehdä rinteiden reunasta reunaan. Liikkumiseen kohdistuvaa voimaa voi muunnella: lasketaan kevyesti tai raskaasti, tasaisella paineella tai kasvavalla voimalla. Käännöksissä voi olla tasarytmi, vaihteleva rytmi ja/tai rytmin voi määrittellä opettaja tai ohjaava rata. Samoja temppuja voi tehdä eri ympäristöissä, eri kokoisista/muotoisista hyppyreistä, samoja temppuja esim.,. pressiin ja reiliin, erilaisia temppuja samaan ympäristöön ym.

Examples of Basic Skills Exercises

Balance/basic position:

- Review basic position; straight running in basic position
- In place: swing or glide skis back&forth to feel pressure on balls – heels
- Ski with your weight on the balls of your feet – on the heels
- Make a small jump (ski tails should come up) after each turn
- Step uphill after each turn
- Feel the pressure in the middle, when turning on the inside edge of the outside foot (sensory points: big toe, ball of foot, heel)
- Feel the insides of both feet (related to the turn)
- Ski with open boot buckles
- Ski backwards
- 360's with snow contact
- Ski snowplow turns with your eyes closed (for safety with a partner to tell you where to go)
- Ski without poles, hands behind the back / hands on the hip
- Ski holding your poles in front (window)/on the sides/ horizontally behind your back
- Ski without poles, press down with the outside hand in each turn "Press the spring on the outside"
- Ski in very low position / in a tall position
- Ski in very wide ski position / in narrow ski position
- Ski on the outside ski only / on the inside ski only
- Ski linked turns on one ski

Balance/turning movements

- Warm up exercises while skiing down (e.g. bending down to touch boot tops; go into low position during turn and up again; skating steps; jumps)
- Ski backwards
- Make 180's and 360's (pirouette)
- Turn the legs underneath your body in short turns
- Turn the legs two times / three times in each turn
- Hold your poles vertically in front, orient your upper body downhill through this "window"
- Make double pole plant on downhill side for each turn
- Ski with both sticks drawing lines on the snow
- Formation skiing in pairs / small groups
- Human slalom

Pressure control

- Feel the three pressure points in place first - then while linking turns: feel ball of foot, heel, and shin against the boot tongue
- To weight the outside ski, in every turn, press the outside ski against the snow (you can use this in snowplow, parallel, and carving turns)
- Make the inside ski light
- Ski with pressure on ball of foot / on heel
- Change weight between inside and outside ski during turns
- Start every turn with pressure on ball of foot

- Ski on the outside ski / on the inside ski
- Early pressure / long pressure in the turn

Edging

Angulation > Edging (knees, hips and the whole body)

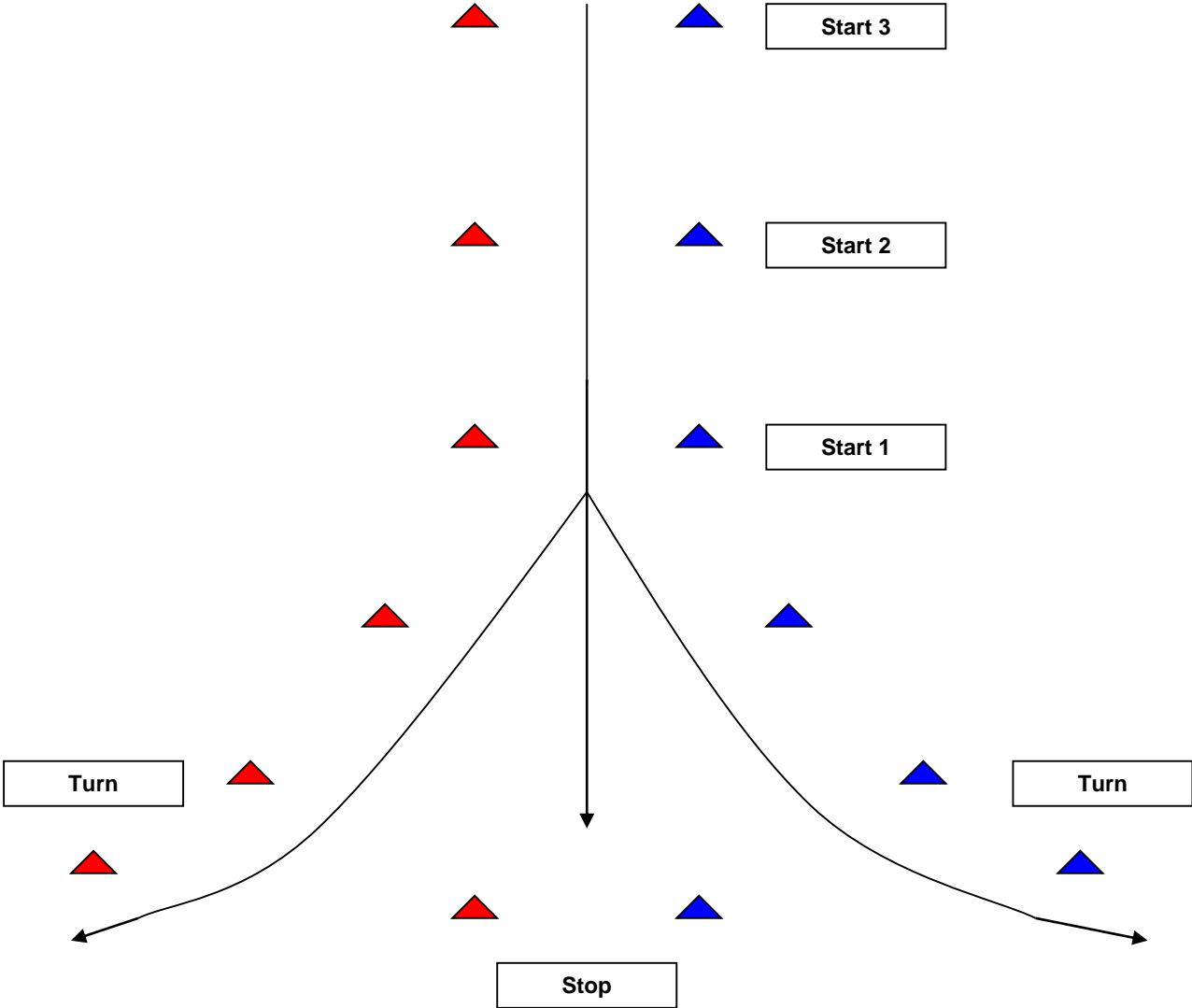
- Turns along inside edges of both skis (feel the ankles rolling into new turn and the inside edges of feet in turns)
- Press the outside big toe ball down for each turn
- Ankle&knee play (side slip-edge-slip-edge)
- Ski across the slope on the edges – “Alpine Basic Position”
- Hands on knees, edge by pushing the knees towards the inside of the turn
- Hands on hips, push the hip sideways in for each turn
- Start the turn by rolling the inside knee first into the turn (to make both lower legs work more or less parallel)
- Total body angulation; incline the whole body into the turn
- Combine inclination and angulation (total body, ankles&knees and hip) for a balanced edging movement
- Show the ski bases to people standing on the the slope side
- Drag poles (draw lines in snow) in carving turns
- Make a quick edge change and early pressure in each turn
- Combine sliding turns / carving turns
- Drift into turn, set the edges for steering (slash turn)
- Make carving turns on the inside ski
- Make carving turns on one ski

Rhythm

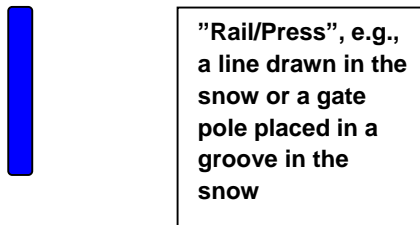
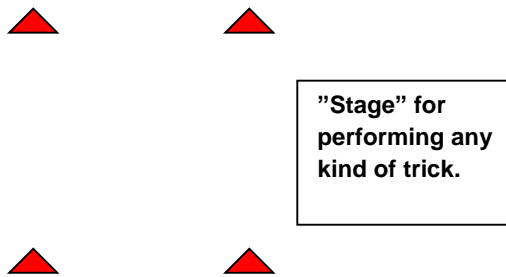
- Short turns, turn the legs under the body
- Tap rhythm with hands or ski sticks
- Short turns, double pole plant on the downhill side / both sides of the body
- Short turns in lower position with pole plant, holding poles in the middle
- Linked short turns in groups in different formations (diamond, line, figure 8,...)
- Count rhythm in longer turns (e.g. 1-2-3 and change,...) to make the movements smooth
- Make rhythm changes (e.g. 5 short-2long,...)
- Ski your phone number (short turns for each number, long turn to move to next number)

Examples of teaching aids

Beginner track



Slopestyle track



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