

Basic steps and spatial-temporal dimensions in the process of skills acquisition in alpine skiing

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Introduction

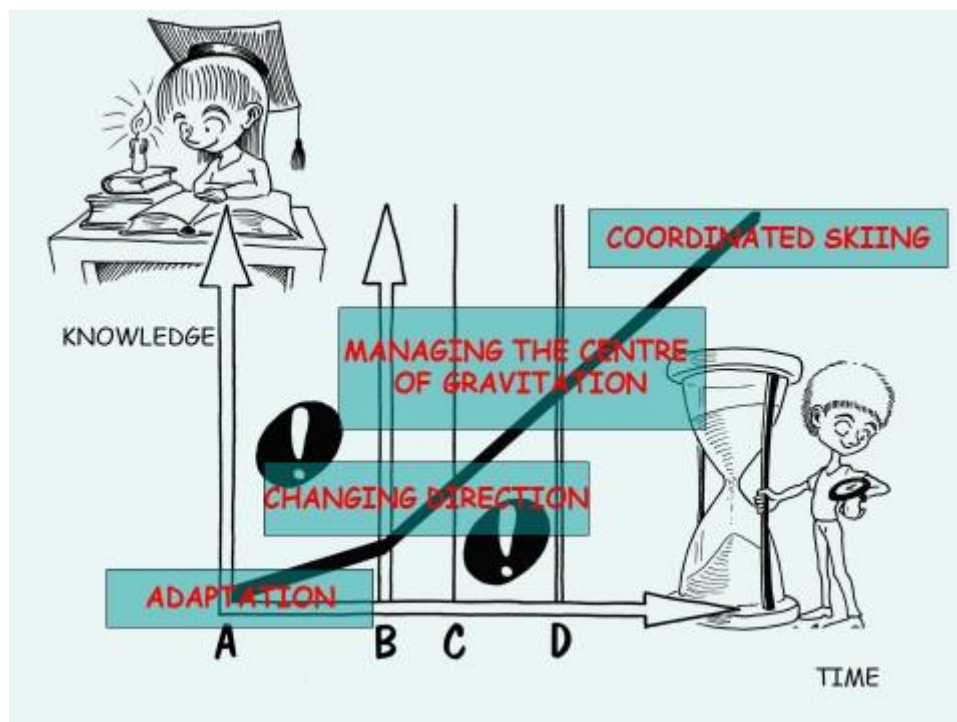
Mastering skiing techniques and good demonstration skills are undoubtedly important ski instructor competences. They are, however, not the only guarantee for the learner to reach the set goal. The instructor should also know the path and the method to get there. This is what distinguishes a good instructor - a creative practitioner - from merely a good skier with no more than knowledge and mastery of figures. So far, this extremely important part of skiing instruction has unfortunately not been given enough attention, particularly such a sensitive field as training beginners from their first steps to when activities on snow already begin intertwining with real ski training. It is in this period that the contribution of a specific expertise is irreplaceable.

There are various ways in which skiing can be presented. It can either be seen as a demanding sports activity or the most beautiful way of experiencing the winter wonderland. However, just like any other sports activity, skiing too begins with learning. To be able to enjoy it also later in life or even upgrade it with real ski training, it must first be learnt. Usually we take it up in childhood, which, of course, is not always a rule. There are certain rules and principles of teaching and learning that apply regardless of the learner's age; while certain age-related characteristics nevertheless require specific approaches.

Ski instruction is a cognitive process in which the learner acquires new skills and thus enriches their motor memory while simultaneously developing the corresponding motor skills. It is a process taking place along certain stages – logically super-structured milestones on the path to skiing ability. The sequence of the acquisition of these stages has a particular importance in learning to ski independently of the tradition or specifics of the ski schools all around the world.

Basic steps in the process of learning skiing

Following the **familiarisation** with the new environment, equipment and surface, the child gradually gains the feel for moving in this environment (sliding). On the basis of numerous experiences this is then followed by gaining the feel for **changing direction** (a turn) and with that a transition across the fall line. In this phase this transition is carried out by the accentuated loading of one ski throughout the turn. In the next stage, the individual must learn to adjust their own centre of gravity. **Managing the centre of gravity** by moving to a higher or lower point, and consequently being able to unload skis at the appropriate time, is a very demanding task for a beginner (for the very young it is almost impossible). It is not until the individual has reached this level of skill that we can set our target on making a fully **coordinated turn** with (or without) a pole plant and on dynamic turning along wider or narrower corridors.



Five spatial-temporal dimensions of movement efficiency in the process of skills acquisition in alpine skiing

When advancing through the mentioned key stages in acquiring skiing skills, the skier must gradually also acquire important dimensions of movement efficiency which will

take them from the first challenging steps to their maximum enjoyment on the white slopes.

In terms of physics, completion of any physical task is a specific way of overcoming the force of gravity in the dimension of time that the individual's body is capable of while being influenced by the environment and the equipment. This is an extremely complex process involving different areas of individual expression. On the basis of the information received from the environment, awareness of one's own body and previous experience, the individual creates an appropriate motor response and executes it with greater or lesser competence through physical action, dependent on the level of motor skill development and the quantity of acquired motor knowledge. In motor learning as well as in exercise, training or even racing, the success of this process depends on certain important dimensions, which, in the course of a single motor action, occur in a specified sequence and provide the necessary precondition for a consistent and successful completion of the action (Pišot, Kipp, Supej, 2015). These dimensions are:

Accuracy of motor task completion

Speed of motor task completion

Timing of motor task completion

Rhythm of motor task completion

Softness of motor task completion

This process always takes place alongside the simultaneous and significant impact of environmental factors - space, surface, equipment, etc. These factors are all the more important when performing motor tasks, the individual is constantly exposed to the loss of balance (e.g., slipping) and heavily dependent on the surface (slope of the terrain, type and temperature of snow) and equipment (sidecut of the skis, quality of the ski boots, suitability of the bindings, etc.).

Accuracy of motor task completion

In particular, it is the force of gravity in the dimension of time that causes the most trouble in performing a motor task. In the initial stage, the control of the motor task is still coarse, unrefined and until a sufficient level of precision and timing has been

reached, satisfying the conditions for completing a task (e.g., a turn in a precise, wanted place), the realisation of the task (e.g., a turn) is impossible. When a sequence occurs - a sequence of movement patterns (proper placement of skis, shifting the centre-of-mass, movement of the body, etc.), which is still uncoordinated and clumsy, but accurate enough to enable rough completion of a motor task, the first condition on the way to motor efficiency is satisfied.

Speed of motor task completion

Speed is the dimension that has a twofold effect on completing a motor task. For the smooth and rational execution of an initial and sufficiently precise motor task, it is essential to achieve the optimal speed – completion of a task at a speed (rather than fast implementation). Speed facilitates execution of a movement and, through acceleration and limiting the time required for the necessary sequence of movements, leads the individual to a progressive automation of initial movement patterns. Thus, for example, performance of a turn in a wedge or later on already in a parallel position becomes less and less an arduous and difficult task. Nevertheless, performing motor tasks at increasing speed can also cause discomfort and fear. When performing motor tasks in which the body is sliding through space (skating, snowboarding, skiing) the centre-of-mass, affected by the statokinetic reflex, shifts downwards and backwards which results in an incorrect position on the skis - and even faster gliding. Speed, which makes skiing easier but can also limit and inhibit the student, should be gradually increased and consciously and systemically included among the basic factors of learning and training in the snow.

Timing of motor task completion

Timing of the execution of movement patterns and the sequence of movements which the skier can already execute with sufficient precision and at optimal speed when performing a certain motor task, leads to an increasingly coordinated and efficient movement. In terms of the energy needed to complete the task, this coordination can be considered as successful and rational, but above all it is reflected in the beauty of movement and in the satisfaction of the individual, who at this stage is already quite pleased with their physical self-image. In skiing, this can be seen in good management of one's centre-of-mass while gliding on skis and in timely

push-off, unloading and directing the skis into turns. The addition of pole-planting in the sequence of movements comprising the ski turn marks a significant milestone in the cyclical nature of the movement and at this point we already have before us a good skier.

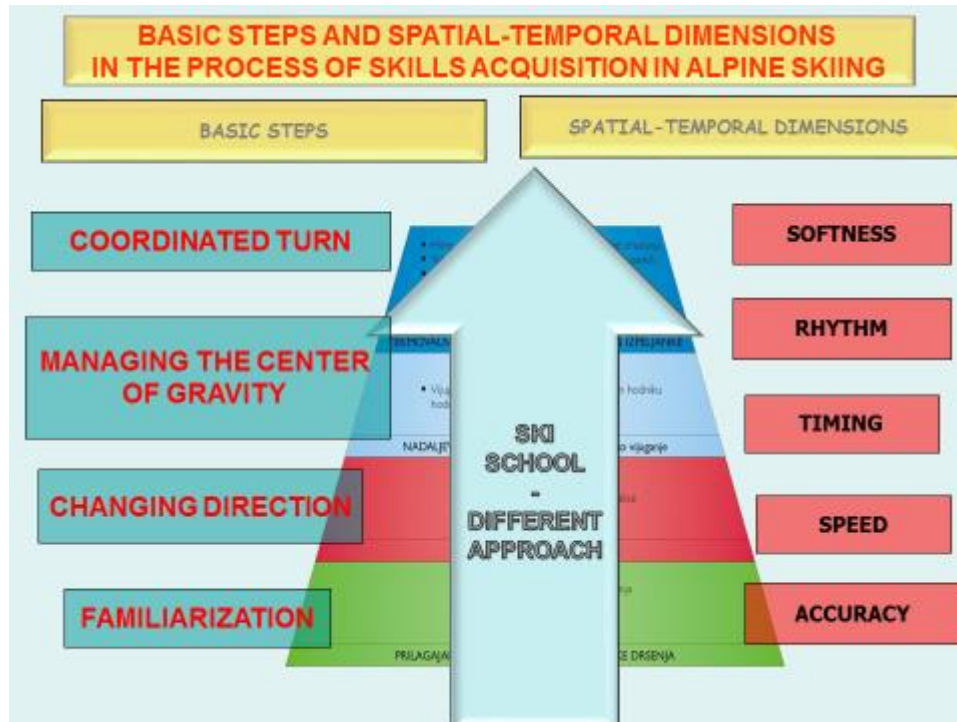
Rhythm of motor task completion

When the individual has mastered a certain motor task to the extent where it can be performed accurately, quickly and with coordination, they are then ready to move to a more advanced movement, the implementation of which is open to possibilities of creativity and leading edge. A rhythmic performance of a motor task along with the ability to modify and adapt the chosen or dictated rhythm requires not only the optimal speed (performance at a speed) and coordination of performance but also a fast and rhythmically coordinated implementation. Skiing thus provides the individual with a range of enjoyments while they are racing in coordinated turns towards the foot of the hill in a rhythm that can be chosen, modified or determined by the width (layout) of the ski run. This dimension is indispensable if we wish to emphasise the importance of the result.

Softness of motor task completion

Softness in performing a motor task is the highest level of movement efficiency an individual can develop. One must possess a high amount of motor knowledge and well developed motor skills in order to achieve this dimension that enables a precise, coordinated and rhythmic execution of the motor task. The motor task can now be performed both quickly and at speed. Relaxation and softness in the implementation of the motor task are crucial in achieving top performance that will be successful regardless of the rapid changes in the environment and even the most stereotypical situations and requirements. In the diapason of skiing enjoyments, this dimension is certainly at the very top. It is reflected through an entire range of ski services and enables the individual to achieve pleasure and beauty of movement. Without softness it is impossible to achieve a quality level of skiing in fresh, deep snow or in difficult racing conditions in demanding technical disciplines such as slalom or downhill run, performed at extreme speeds. When the skier is in such a complex situation, entailing extraordinary effort and the last atoms of power, but remains responsive enough to accept and correct minor discrepancies and errors as directed

by the current situation, then we can affirm that all the necessary dimensions of quality skiing have merged together, including accuracy, speed and timing, rhythm and softness of performance.



As shown in the diagram, the presented dimensions of movement efficiency follow the key stages in acquiring skiing skills through ski instruction, practice and training. Regardless of individual ski school services, which usually differ between individual alpine schools (Slovenian, American, French, Italian, Austrian, etc.), in learning and practising skiing we cannot afford to bypass the stated basic steps and dimensions of movement efficiency. Each individual skier must attain and surpass them on their own. The ski instructor must be familiar with these stages and dimensions and must also be aware of their significance and role in order to enable the students to achieve them in the friendliest manner possible. In this context, the services agreed upon in individual alpine schools are only a means and a path.

References

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