Chapter 7

The IASI Skills Model (SM)

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"Lose the drill and keep the skill".

Unknown

Learning objectives– at the end of this chapter you will be able to do the following:

- Understand the importance of developing skills e.g. function rather than form.
- Understand why IASI uses additional activities as an integral part of training and examination.
- Understand the IASI technical philosophy and how it links to IASI's overall philosophy, while permeating through the skills that we teach.
- Understand what the IASI Skills Model is and how we teach those skills to the learner.
- Understand the interplay between the skills we teach, balance and movements.

List of topics:

- Skill(s).
- Drills or exercises.
- Additional activities.
- Technical skiing philosophy.
- The IASI Skills Model (SM).

Introduction

It is incumbent on us to begin this chapter by defining skill or skills before delving more deeply into the IASI Skills Model itself.

Skill is simply the *ability* to do something well and is associated with some level of expertise. Skills are domain specific and in snowsports becoming proficient at using certain skills means choosing the right skill or 'blend' of skills, at the right time, to the right degree, with the minimum of effort, for the specific environment, to allow the performer to successfully execute the task.

In many sports, instructors use a variety of drills (or exercises) to develop these domain specific skills. However, it is vital that the 'drill' is only used as a tool to develop the skill, or skills, rather than being an end in itself hence, we are not trying to perfect the drill per se; as to do so would lead to form rather than function. This highlights the importance of this chapter's opening quote, "lose the drill and keep the skill" which is a mantra that all snowsport instructors should keep at the forefront of their thinking when planning and delivering lessons. In practice this means **not** finishing a lesson with a drill, but building in sufficient time to ski/ride 'normally' towards the end of the session allowing the learner to derive benefit from the drill(s) that have been used earlier in the lesson.

Additional activities

IASI has built in a number of additional activities at each level of the alpine certification system. These 'activities' are designed to test specific skills that relate to the outcome standards for that level of certification. By using these activities (and other variations of them) the learner (who in this case is the instructor) is guided towards the type of 'drills' that are useful to incorporate into their practice. It should be noted however, as eluded to earlier, that the goal is not to perfect the specific additional activity but rather to use it as a tool to develop all mountain performance.

These additional activities will be covered, in more detail, in the chapters that follow as they relate to piste, variable terrain and bumps. Suggested reading and resources toward the end of each chapter will also guide the reader to what the specific activities are and to the outcome standard videos, which show a selection of them being performed by members of the education team.

Technical philosophy

The IASI technical skiing philosophy is as follows:

To develop all mountain skiers who have the ability to use a blend of the skills in such a way that the skis can be steered accurately, dictating speed and direction, on a variety of terrain and in different snow conditions, using efficient and effective movement patterns that work in harmony with the bodies anatomy.

While the statement above may, at first, seem a little long-winded it is deliberately so because there is important meaning behind the words which link to IASI's overall philosophy of Learn it, Love it, Live it and our overriding goal of looking after the instructor's (and their guests) physical, mental and emotional well-being.

So lets look at the above statement in more detail. **All mountain skiers** means being able to comfortably and skilfully ski the huge variety of terrain and snow conditions (not to mention weather conditions) that are experienced within the ski area. This would include groomed slopes, ice, crud, powder, bumps, steeper terrain, cambered terrain, rollovers, artificial surfaces etc. The IASI snowsport instructor will show a high-degree of competence in a great variety of conditions both on the mountain and at different artificial venues such as indoor snowdomes, outdoor artificial slopes (dendix, snowflex etc.) and indoor rolling carpet slopes.

Using a **blend of the skills** is highlighted by the inclusion, in the outcome standards of level 3 and level 4, of the *advanced parallel turn*, which is a high performance turn that is 'not' purely carved. It requires a great deal of skill to blend the steering elements to different degrees to produce **accurate steering** that **dictates speed and direction**. And it is the combination of blending skills to match the mountain that leads to the learner moving through to the performance and flow stages of the Diamond Model of Skill Acquisition (see chapter 14 for more on this).

Using **effective and efficient movement patterns** is an integral part of the IASI Skills Model and our approach to teaching the skills. However, of even greater importance is that these movements **work in harmony with our bodies' anatomy** and the biomechanics of the sport (as covered in chapter 3) so that we avoid undue stress and unnecessary injury. A good example of this is our approach to skiing bumps, (which will be covered in greater detail in chapter 11), where we encourage a variety of lines and turn shapes that promote using a range of skills, while avoiding deeper rut lines that can adversely affect the performer both physically and mentally.

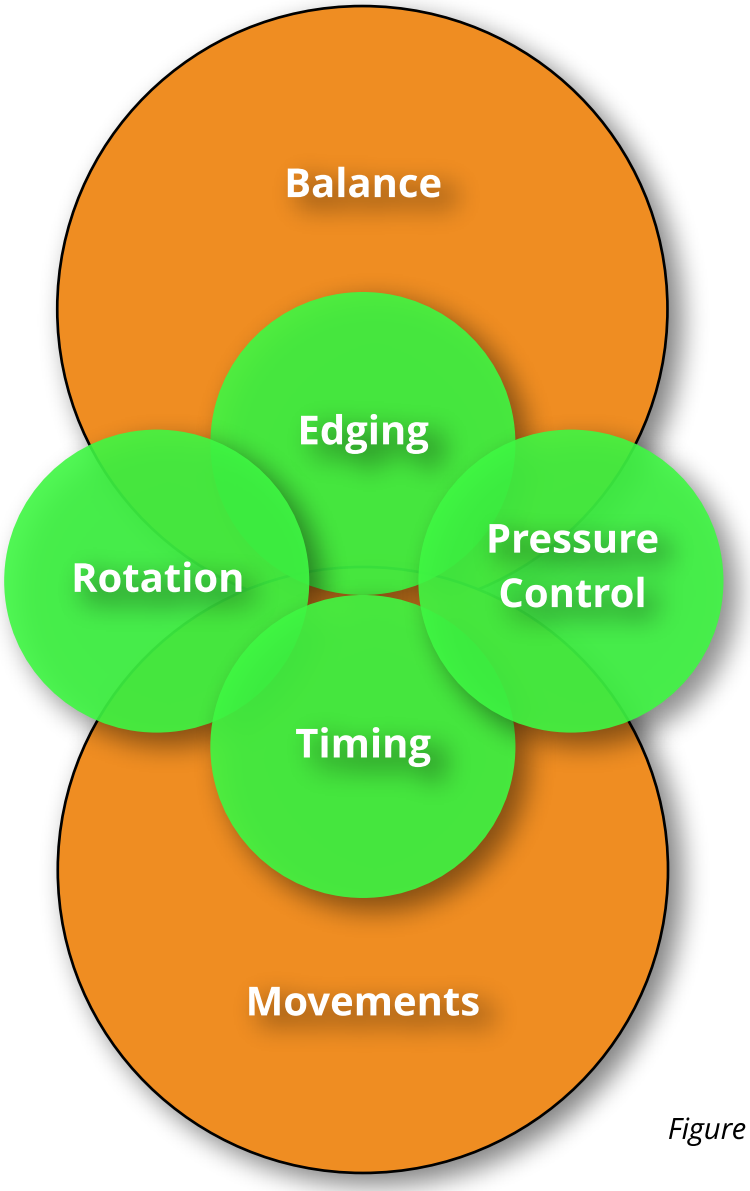

Figure 1

The IASI Skills Model (SM)

The IASI Skills Model (Figure 1 opposite) has at it's core the skills that we teach: rotation, edging, pressure control and timing. These skills are all of **equal** importance and are embodied within the overriding fundamentals of balance and movements. Reflecting back to the basic principles (see chapter 2) the essence of the message here is that skiing works from the snow upwards and then back to the skis! In other words, we respond to and create forces, with appropriate movements, to aid effective balancing, allowing for accurate steering of the skis. Therefore, the skills that we teach allow us to acquire the basic principles of skiing and it is the interplay between these skills, balance and movements that we will flesh out, not only in the rest of this chapter, but in the chapters that follow as the skills are applied to Core Skier Development (CSD), piste, variable terrain and bumps.

Rotation

The skill of rotation in steering the skis is perhaps the element that most guests are least aware of and in many cases the least skilful at performing. What we are talking about here is movement about an axis and specifically the movement of the legs/feet in order to pivot the skis. The ideal pivot point is underneath the foot where the index mark on the ski boot aligns with the index mark on the ski. The chapters that follow will focus more on the specific movements of the body while this chapter will deal more with the pivoting or rotating of the skis and how and why that movement is so important to the process of steering the skis.

For all of these skills, the instructor can use specific drills to highlight the individual skill but ultimately the four skills of rotation, edging, pressure control and timing need to be used together and that is what makes the performance more effective and skilful. Drills like braquage (also known as pivoting on the line or pivot slips) are a great way of developing rotation. To allow this to happen more easily the skis need to be on a low edge angle. Braquage, however, is a difficult drill if only seen in its 'end form' i.e. keeping the skis parallel at all times. This, perhaps, re-emphasises the point that the goal is not to perfect the drill but rather to find drills that help to develop the skills. So, finding variations of braquage is a way of matching the drill to the learner's ability level e.g. plough parallel braquage, braquage with a longer direct side-slip between pivots or even plough parallel with a diagonal side-slip at the bottom of the turn.

DEFINITION

The French describe Braguage nicely as:

Mouvement de flexion et pivotement des pieds par lequel le skieur un changement brutal de direction des skis.

Rotation is also more 'obvious', both for the performer and the observer, when it is a quicker pivoting movement. However, rotation needs to be blended into the turn so that it is smooth and constantly 'available' to guide and shape the turn. This also promotes the idea of "using the C rather than the V" when referring to the resulting turn shape. Even the 'advanced parallel' mentioned earlier in this chapter requires a skilful application of rotation to help shape the turn.

So, in summing up, to use rotation skilfully, as part of the steering process, requires a great deal of practice and the ability to change the amount (how much/how little), while being able to time the where/when (see the section on timing towards the end of this chapter). And this will vary greatly on different terrain and in different conditions. Furthermore, on artificial surfaces such as dendix and snowflex, where the resistance is greater, these tasks are, to some extent, a little more difficult and certainly generate different 'feelings' and 'sensations'.

Edging

Edging refers to the angle of the ski or skis against the snow. For many of our guests, and indeed instructors, when asked, what edging is, the response would be along the lines of "increasing the angle of the ski against the snow". And while this is certainly 'partly correct' **the decrease in angle is of equal importance**. To help with our understanding of 'edging' it is useful to use the word 'tilting' as this describes more accurately the movement involved in increasing and decreasing the angle of the skis against the snow. At this point, we are only referring to what is happening to the skis themselves and not to the parts of the body involved in tilting the skis (this will be discussed more in the chapters that follow).

Misconceptions and misunderstanding are commonplace in a sport such as skiing and in relation to the skills being discussed here in the IASI Skills Model. For example, many of our guests believe that increased edge results in greater control, when in fact increased edge simply means increased speed. This is often seen when a learner leans into the hill, perhaps through fear, resulting in an increase of edge angle, a lack of balance and an increase of speed across the slope.

One of the best ways to develop 'appropriate' edging skills is through a variety of side-slipping drills. The beauty of side-slipping is that it requires the learner to become skilful at **modulating** the tilt of the skis against the snow while at the same time promoting good balance on the bottom ski (outside ski when turning) as well as fore/aft balancing along the length of the ski. Examples of these drills include: direct side-slip (down the fall line), forwards diagonal side-slip, backwards diagonal side-slip and falling leaf (combing forwards and backwards diagonal side-slip). However, there are many more variations and the message here is that time spent developing the learners side-slipping skills will not only develop their edging skills, but will allow them to access much more of the 'mountain' and to bridge the gap between intermediate and more competent skiing performance.

Another misconception is that 'grip' and edging are almost one in the same! However, edge without balance results in an inability to use the other key components of steering namely: rotation and pressure control. This is perhaps most apparent when recreational skiers tackle more icy conditions. A phrase that I have often heard learners use is that, "I need to dig my edges in" to cope with the firmer or icy conditions on the slope. Unlike the racer, the average recreational skier does not ski at very high speeds hence, the relationship between increased angle and increased speed is not a desirable goal in this instance. Control on ice (at lower speeds) comes through modulating and often decreasing the tilt of the skis against the snow promoting good balance and allowing rotation and pressure control to be used effectively to continue dictating or guiding the skis in the desired direction.

REFLECTION

What phrases do your guests use when talking about the skills? Are they simply using different terminology or are the phrases rooted in misconceptions about how the skills are used?

Short turns using a good blend of edging, pressure and rotation to maintain 'grip'.

As a final point relating to the skill of edging, at this stage in the manual, and to reinforce the importance of being able to skilfully decrease the tilt of the skis against the snow it is important to understand how this movement aids a smooth transition between turns. Maximum edge angle occurs around, or just after, the apex of the curve with the skier needing to match deceleration towards the end of the turn with reduced edge angle. This allows the skier to remain balanced on the outside ski of the turn as the speed reduces and the edges are changed to begin the new turn. A good way to highlight this is to do the 'stork turn' (inside ski lifted at the tail throughout the turn) and to focus on maintaining balance on the outside ski as the turn is completed. If the lifted ski is kept off the ground easily and then gently placed back on the snow to initiate the new turn then this is a good indication that the edge angle has been modulated appropriately. Drills like this are also an ideal way for the learner to self-check their own performance (see chapter 17 – learning styles, which incorporates teaching styles).

Maximum edge angle around or just after the apex of the curve followed by reduced edge angle to aid smooth transition between turns.

Pressure Control

Pressure control can, at times, be misunderstood or become 'confusing' to our guests. A phrase that I (Derek) like to use is, "balancing against the ski" because it links the fact that in order to either exert pressure through the ski, or manage the pressure that is already there, the performer needs to be 'in balance' in relation to the outside ski of the turn. So, separating balance from pressure control is simply not possible!

As has been the modus operandi of this chapter so far we will focus more on pressure control in relation to the skis rather than the specific movements of the body that create and manage pressure with the exception of discussing the ankle joint. Chapters that follow will delve more into the leg movement, hips and the upper body and how the movement of these can help or hinder pressure control.

Pressure control can therefore be categorised as ski to ski (or outside and inside ski in a turn) or fore/aft (along the length of the ski).

In this picture pressure is being exerted through the outside ski promoting good balance which is evident as the ski is in reverse camber.

In general terms, the goal is always to have the greater pressure on the outside ski of the turn. The first half of the turn, where the skis are steered to the fall line, is where pressure builds up or is 'created'. The second half of the turn is where pressure is managed and the skis are turned across the bodies' line of momentum. Once again this is where the separation of the skills becomes difficult because the interplay between creating and managing pressure is highly correlated with edge angle, which in turn is dictated by speed.

The difference between an intermediate and advanced skier and to bridging that gap largely comes down to the learner's ability to effectively use the ankle joint to influence pressure control along the length of the ski from tip to tail. The general principle, when making turns on skis, is to engage the tip at the start of the turn and then progressively move the pressure along its' length to the tail (towards the end of the turn). This can be subtle or more pronounced depending on factors such as terrain and speed. While the outcome is to move the pressure along the ski, the performer will likely feel it as a progressive movement along the inside of the foot – toes/ball of foot – arc – heel. The key to being able to achieve this is, the ability, to close and open the ankle joint. Closing the ankle joint allows the skier to engage the tip, while opening the joint allows the pressure to move aft. But, timing is crucial and this takes both practice and a heightened awareness of the intrinsic feelings and the connection between the foot and the ski. After all we ski with our feet and the ski is simply an extension of the foot.

The dolphin turn is an excellent drill for developing fore/aft pressure control and the ability to close and open the ankle joint. It is however, a drill that in itself requires a high level of skill hence, it is one of the additional activities for the level 4 certification in the IASI system. Skiing bumps and variable conditions (including powder) is where this dolphin movement pattern becomes extremely effective consequently we will revisit this in chapters 10 and 11.

Using the ankle to manage pressure

In this photo the ankle joint is 'open' allowing the pressure to move aft and releasing the feet forward.

While in this photo the both skiers have 'closed' ankles with the skier in front about to release the feet forward and 'open' the ankles to aid the turn transition.

Timing - bringing it all together

Timing has been beautifully described by education team member, Shona Tate, “as the where and when in the turn while rotation, edging and pressure are the how much and how little”. She describes it further by emphasising that “timing also involves the speed or rate at which the movement is applied”. Like so many sports the learner can become technically competent in the component skills, in this case rotation, edge and pressure control but if the ‘timing’ is not right then the whole performance breaks down. So in essence timing brings it all together.

So how do we teach timing? In many ways timing is more challenging to teach than the three steering elements, that have already been covered, as it involves the timing (where and when) of the movements used in rotation, edging and pressure control. And while these movements themselves are more intrinsic, timing itself is often achieved through a more extrinsic focus. For example, getting your learners to ski around markers gives them an external focus that promotes better timing (provided the markers are set in a way that develops rhythmic turns). Skiing a defined corridor width, funnels and hourglasses are all good examples of extrinsic focuses that can promote better timing. While using counting or mantras e.g. extend and rotate, bend and rotate can help with the timing and sequencing of the movements involved in a more intrinsic and cognitive way.

REFLECTION

When you are teaching your guests do you use drills that have both an intrinsic and an extrinsic focus? And do you use this kind of focus to suit the individual learners' needs and ability level?

The IASI education system also promotes the development of timing through the assessment, at L3 and L4 in the alpine certification, of mixed turns: going from long to short and short to long. This then feeds through nicely to the end goal of developing all mountain performance.

Summary – key points from this chapter

- Skill is simply the ability to do something well and is associated with some level of expertise.
- The goal is NOT to try to perfect the drill per se; as to do so would lead to from rather than function.
- IASI uses additional activities, as part of the alpine certification system, to test specific skills that relate to the outcome standards at each level.
- Using effective and efficient movement patterns is an integral part of the IASI Skills Model as it ensures that there is harmony with our bodies' anatomy and the biomechanics of the sport.
- The skills of rotation, edging, pressure control and timing are all of equal importance and are embodied within the overriding fundamentals of balance and movements.
- To use rotation skilfully, as part of the steering process, requires a great deal of practice and the ability to change the amount (how much/how little), while being able to time the where/when.
- The ability to increase and decrease the edge angle of the skis against the snow is of equal importance.
- The difference between an intermediate and advanced skier and to bridging that gap largely comes down to the learner's ability to effectively use the ankle joint to influence pressure control along the length of the ski from tip to tail.
- Timing has been beautifully summed up by education team member, Shona Tate, "as the where and when in the turn while rotation, edging and pressure are the how much and how little".

Suggested reading and resources

This chapter has gone into some detail about the domain specific skills of skiing and differentiated between skills and drills, function vs. form and how to teach and develop those skills both for you, the instructor, working through the certification system and for the guests that you teach. Two of the best books ever published, about the skills approach to skiing, were written by John Shedden, who at the time was Director of Coaching for the English Ski Council (now Snowsport England). These books are "Skilful Skiing (1982)"and "Skiing: Developing your skill (1986)". For more up to date information readers are encouraged to watch the IASI outcome standards videos from levels 1 to 4, which include some of the additional activities as well as performances on a variety of snow conditions and terrain including indoor snowdomes and artificial slope (dendix) for the level 1 video.

References

IASI Outcome Standards Videos – Levels 1 to 4, www.iasisnowsports.com

IASI Technical Assessment Criteria – Levels 1 to 4, Documents section, www.iasisnowsports.com

Tate, D. (2007). Parallel Dreams Alpine Skiing: Taking your performance to new levels. *Parallel Dreams Publishing*. ISBN: 978-0-9556251-0-7

Skiers featured in the photos are: *Andy Bennett, Phil Brown, Dan Gillespie, Jamie Kagan, Chris Oldaker, Jordan Revah, Raphael Revah, Mark Shaxted and Shona Tate.*