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Self-regulation and performance profiling for athlete's self-determined development

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Bachelor Thesis
Degree Programme in Sport and Leisure Management
December 2016

HAAGA-HELIA
University of Applied Sciences

Abstract

Date of presentation: 30.11.2016

Degree programme

Author or authors Lovro Bajc	**Group or year of entry** DP12
Title of report Self-regulation and performance profiling for athlete's self-determined development	**Number of report pages** 70 + 7
Teacher(s) or supervisor(s) Markus Arvaja	

The athlete's road towards attainment of expert performance is long and arduous. A considerable amount of time must be deliberately invested to develop multiple-performance characteristics, while simultaneously overcoming numerous constraints. In order to do that, the athlete has a relationship to a sport practitioner, whose role is to create optimal and effective practices in which the athlete is integrated and actively engaged in a self-determined process as a self-regulated, motivated learner.

This type of self-regulated and self-determined practice is established in a theoretical review, which includes its branches of basic psychological needs and personal construct theory. From this theory, mechanisms for the creation of optimal coaching practice were identified and transferred into reality, with a season-long implementation in the development of an ice hockey club participating at the highest level of Finnish competitive junior U18 ice hockey.

The objective of the research was to measure athletes' perceptions of the usefulness of the implemented framework, identify its future potential, and the degree to which athletes' basic psychological needs in sport were satisfied. The aim was for results to reflect on the practicality, quality and importance of the practice.

This study shows that for the framework to be useful players had to believe they would repeatedly benefit from it in the future. Furthermore, relevant statements anchoring constructs indicated that this framework had significant impact on the level of athletes' confidence, self-awareness, and motivation. It helped to increase their sports-based knowledge and provided the means for monitoring performance. Indices, which can serve as a catalyst for coach-athlete relationship development, were obtained. Satisfaction of the basic psychological needs for autonomy, competence and relatedness was high.

Keywords
Athlete-centered coaching, performance profile, self-regulated learning, basic psychological needs, coaching practice, self-determined deliberate practice

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1 Introduction

The road to excellence in a desired performance is rocky, marked with various constraints which must be overcome to achieve success. This road can be navigated by continuously using self-determined and self-regulated learning skills to plan, execute, evaluate, and constantly reflect on the way forward. If these skills are deployed in an optimal learning environment, multidimensional performance characteristics can be developed which satisfy the performance levels required and fulfil the ultimate goal of expert performance.

However, in order to minimize constraints and avoid falling off the road altogether, the journey has to be as optimal and efficient as possible. This is achieved using resources and support structures to foster the athlete's optimal motivation and to maintain satisfaction of his basic psychological needs.

The sport practitioner plays a significant role in directly affecting the athlete's journey and allows him to stay the course. In this thesis, the role of the sport practitioner is referred to as the sport coach. It is his role to produce the support structure and to create an optimal autonomy-supportive environment for the athlete's personal journey. The sport coach has responsibility to facilitate learning opportunities for the self-determined use of self-regulated learning skills, to satisfy basic psychological needs and to utilize, transfer, and make available his resources (knowledge and expertise) during practices.

As the International Council for Coaching Excellence (ICCE) suggests, the motives, needs, and aspirations of participants change through their participation in sports, requiring coaches to use all resources to target the needs of athletes for proper development (ICCE, 2013). This implies that no matter what the sport, practitioners are urged to use individual approaches in their athlete development practices and, through the optimal deployment and integration of an athlete, help him target those needs and minimize constraints.

At the beginning of this thesis, readers are first familiarized with theoretically significant topics, where the groundwork is established for practices that allow the creation of athlete-centered, self-determined, and self-regulated development. Once the theory has been introduced, it is then transferred into the real environment. Central to this is the individual development framework, which was established and implemented by the author during a season-long competitive schedule of one chosen ice hockey team. Empirical evidence is presented and discussed in relations to proposed hypotheses, to identify and justify the value of the proposed framework and its effect on the satisfaction of basic psychological needs. At the end, the author's first-hand experiences during the implementation process are presented, in order to provide additional information and familiarize interested individuals with the possible constraints of implementation.

The domain-specific (sport) content of the thesis should therefore be of interest to readers interested in the topic in general, aspiring coaches, coaches in charge of athlete development, leaders of coach education programs, or others who are simply looking to update, change, or modify their already established coaching practices and philosophies on athlete development.

2 Creating the ground for self-determined development

2.1 Development of talent

The road each individual travels in order to attain expert status in a sport-specific task performance is extensive and subject to available time, person-related characteristics, and the quality of the environment. As the Deliberate Practice Theory (Ericsson, Krampe & Tesch-Römer 1993, 368) proposes, the period of time required to participate in a certain domain, with the goal to attain expert levels of performance, extends to at least 10 years and is marked with multiple constraints. Constraints are in the forms of access to optimal resources (qualified professionals, training materials, practice facilities, etc.), lack of inherent motivation and enjoyment of participation, and the enormous amount of effort required to maximize improvement.

As further demonstrated from the hypothetical model representing the development of an athlete's sport performance over time (Figure 1), athletes also need to have a certain combination of person-related (psychological, anthropometric, physiological, technical and tactical) and environment-related (training facilities, coaches, organization, and competition structure) characteristics to execute successful performance in a given sport-specific task, where maturation level and learning also play a vital role (Jonker, Elferink-Gemser, Tromp, Baker & Visscher 2015, 317).

While the amount of time the athlete invests in training and being exposed to learning is indeed crucial for success in attaining a high level of expertise, the differences in skill level between each individual inside complex domains of participation has yet to be clarified. (Macnamara, Moreau & Hambrick 2016, 346; Macnamara, Hambrick & Moreau 2016, 355.)

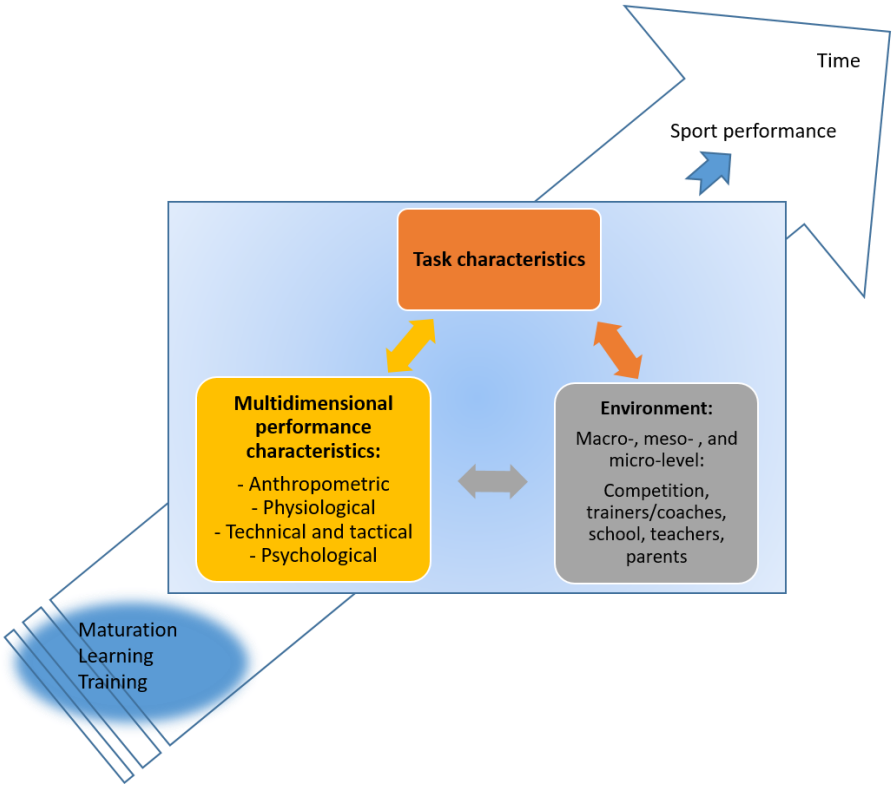

Figure 1. The talent development model including personal, task-related, general characteristics, and environment-related characteristics (Jonker et al. 2015, 318).

As recent investigations into the relationships between deliberate practice and performance in sport indicate, there is a need to start shifting our focus towards identification of factors which seem important, such as deliberate practice, and their contribution to individual differences in the acquisition of expertise. This might further bridge the gaps in understanding these individual differences. One proposed domain where those factors can be identified is the individual cognitive abilities deployed throughout the learning process and the practices (Macnamara, Moreau & Hambrick 2016, 346).

This seems logical, since the most powerful determinant of performance improvement in skill acquisition is indeed the athlete's exposure to opportunities for learning and training (Jonker et al. 2015, 318).

2.2 Importance of athlete integration into the development process

The theoretical framework for the acquisition of expert performance assumes that, to ultimately attain expert performance status (the goal), the athlete should invest the maximum amount of available time on practicing the sport-specific skill. However, throughout this investment process, he will be faced with motivational constraints. For example, the monotony of practice, due to the huge number of repetitions and the time required to obtain a sufficient skill level, will not be inherently motivational and enjoyable, and will result in a withdrawal from the skill acquisition process (Ericsson et al. 1993, 371).

To prevent this constraint from arising and to develop optimal practices, practitioners need to obtain an understanding of why and how one is motivated, how certain behaviours are elicited, and how executed actions are mediated. Important to this understanding is that people are motivated when they intend to accomplish certain goals with a purpose (Deci & Ryan 1994, 3), in this case attaining expert performance.

2.2.1 How one can be motivated

As proposed by the self-determination theory (SDT), there are different types of motivated behaviour with different qualities, which guide a person in the process of goal attainment. SDT distinguishes between human motivated and amotivated behaviours, and differentiates the types of motivated actions one executes. Intentional motivated behaviours are aimed at accomplishing a certain goal. They vary from behaviour and action perceived to be freely chosen (self-determined autonomous behaviour, i.e., originating from one's self), to behaviour and action enforced by others (controlled behaviour). (Deci & Ryan 1994, 4; Moreno, Carvello & Gonzales-Cutre 2010, 390.)

Fostering self-determined behaviours, according to the literature, is more optimal and desirable, since they are identified as higher quality and more positively correlate with performance when compared to controlled behaviour (Deci & Ryan 1994, 5).

A short investigation of extrinsic and intrinsic motivational perspective is helpful to understand why one deploys these behaviours for goal attainment. A person extrinsically motivated to engage in a certain behaviour or activity wants to attain some goal which is not related to the activity itself. This implies that the origin of this type of motivation is not due to inherent enjoyment of the activity, but the need to gain something from it. In contrast, a person intrinsically motivated to engage in a certain behaviour or activity seeks the pleasure of participating in a chosen environment and skill exercise. This is characterized by seeking out novelty, challenges, exercising different capacities, exploring and learning. Active engagement in optimally challenging and interesting tasks of one's own volition, promotes growth. (Deci & Ryan 2000, 233, 235; Ryan & Deci 2000a, 70; Ryan & Deci 2000b, 56, 60; Ryan, Geoffrey, Williams, Patrick & Deci 2009, 109, 111.)

To be intrinsically motivated, to do something driven by self-specific motivational behaviour, is related to how much a person's basic psychological needs (BPN) are satisfied. Optimal satisfaction of BPN is believed to contribute to intrinsic motivational behavioural engagement because it provides energy and direction, resulting in the sustained behaviour for the individual to function optimally (Deci & Ryan 2011, 19).

2.2.2 Basic psychological needs and intrinsic motivation

A sub-theory of SDT identifies the basic psychological needs required to be optimally satisfied. For an individual to become intrinsically self-motivated and efficient in achieving identified goals, the personal needs of autonomy, competence and relatedness need to be satisfied. These are fundamental for ongoing psychological growth, integrity, well-being and effective functioning. (Deci & Ryan 2000, 227, 229; Ryan & Deci 2000a, 68, 74; Ryan, Williams, Patrick & Deci 2009, 114.)

The need for autonomy is a psychological need, in which a participant feels a sense of freedom and has the opportunity to choose and make a decision. The more the individual perceives his action was caused by the internal reason for engaging in the activity, the higher is the satisfaction of the need for autonomy and the optimal level of intrinsic motivation attained. (Sari 2015, 159; Deci & Ryan 2000, 234.)

The need for competence is described as the desire to be efficacious and effective in various tasks to be accomplished. By satisfying the need for competence, one will satisfy the need for successful interaction with the environment and experience the opportunity for development of one's own desired capacities, making the person more intrinsically motivated. (Sari 2015, 159; Vlachopoulos, Ntoumanis & Smith 2010, 395.)

The need for relatedness means a desire to be respected, connected, and cared for by others who are part of the social environment the person is involved in. Satisfying the need for relatedness will therefore make the person feel genuinely connected to others and feel part of the group (belonging), which will develop a sense of security. However, the importance of this need for the development of intrinsic motivation might not be the same from person to person, since people engage in intrinsically motivated behaviours in isolation. (Sari 2015, 159; Deci & Ryan 2000, 235; Ryan et al. 2009, 115; Vlachopoulos et al. 2010, 395.)

With respect to the importance of basic psychological needs in human intrinsic motivation, the development of optimal coaching practices is required, allowing the structure of the learning environment to satisfy an athlete's basic psychological needs, regardless of age (Sari 2015, 163), and facilitating intrinsically motivated behaviour as the athlete pursues of his own self-determined outcomes (goals). (Deci & Ryan 2000, 227; Occhino, Clifford, Rynne & Carlisle 2014, 404.)

2.2.3 Creation of optimal coaching practices

For intrinsically motivated behaviour to occur, individuals must experience satisfaction of basic psychological needs, thrive psychologically, and perform effectively (Deci & Ryan 2011, 19). Therefore constructing practice which supports satisfaction of these needs is required. To do that, an environmental shift needs to occur, from controlled towards autonomy-supported. This allows athletes to be part of self-determined learning (Ryan & Deci 2000b, 65), in which practitioners, through individual approaches in the development process, allow for maintenance of intrinsic motivation and athletes' well-being (Schüler, Wegner & Knechtle 2014, 302).

This requires integration of an athlete into the development opportunity, in which he accepts the structure of the practice as his own and becomes fully integrated with it. Practice should allow the athlete to be personally meaningful, acknowledge his perspective, and allow for freedom of choice. Upon successful integration, an athlete will identify himself with the values of an activity and accept full responsibility for them, establishing self-determined intrinsically motivated behaviours (Deci, Eghrari, Patrick & Leone 1994, 121-123). Subsequently, the satisfaction of an athlete's basic psychological needs will be achieved, resulting in the increase of self-determined motivation and the optimal psychological state, which leads to higher loyalty to the practice program and elevated performance (Moreno et al. 2010, 397). An athlete's integration and fostering intrinsic motivation have been highlighted as the basis for the creation of self-determined functioning and motivation characterized by the total involvement of self (Deci & Ryan 1994, 7).

Environments which foster and maintain participants' intrinsic motivation through the deployment of practices must be interesting, challenging and enjoyable, allowing an athlete to be actively involved and to have opportunity to manipulate, explore and challenge himself (Ryan, Geoffrey, Williams, Patrick & Deci 2009, 109).

Practice strategies should allow an athlete to choose activities, while being cognizant of specific demands of the domain, open to practical considerations or other limiting external factors. The choices made should have specific rules and boundaries, be meaningful to the athlete, and meet basic psychological needs. To satisfy the needs requires the sport practitioner offering a choice of drills/strategies that help develop particular skills relevant to the athlete's goals, ensuring that the choices are not too numerous or complex and are in line with the athlete's development level (Ntoumanis 2012, 121).

2.3 Importance of self-regulation in learning

Taking previously-identified resource constraints out of the equation led self-regulation theorists to look at specific sub-processes deployed by learners, with the intention of reaching self-established goals and making the learning process efficient and motivationally enjoyable.

The theory of self-regulated learning looks at the learning process as a phenomenon, in which each individual deploys interconnected behavioral and task-related processes to optimize and control personal learning events (Zimmerman 1986, 307), reflecting one's own capacity to manage personal learning behavior (Jonker et al. 2015, 320). The theory further proposes, that one's ability to cyclically use or manage one's own situational-related intellectual, emotional, and motoric learning process inside an environment, allows a person to structure personal opportunities for continuous learning and will elicit self-initiative behaviour, leading towards effective engagement in the learning process to achieve skill improvement. (Zimmerman 1986, 307; 2012, 143; Kitsantas & Zimmerman 2006, 211.) These self-initiated cognitive processes build all-around learning through cyclical deployment of phases, identified as self-regulation processes (Bandura 1991, 282).

2.3.1 Deployment of phases with sub-processes for self-regulated learning

The self-regulation process structure with its sub-processes (Figure 2) is viewed as three cyclical phases continuously deployed by the learner (Zimmerman 2002, 65). These processes have been established through findings from academia and achievement, where qualitative separation with quantitative measurements led to the conclusion that the process is highly predictive of motivation levels for learning and achievement (Zimmerman 1998, 84).

Throughout the first part of the self-regulatory cycle (the forethought phase), the learner identifies the processes required for learning enhancement and the personal motivational beliefs in connection with the topic. This is before any effort is invested into further learning. This phase is constituted from two distinctive aspects, the task analysis process and self-motivated beliefs. The task analysis process exposes learners to analysis of the task at hand, where identified weaknesses lead to implementation of the goal-setting process and planning how the goals will be attained. The self-motivation aspect exemplifies intrinsic beliefs about one's capacity to learn (self-efficacy) and what personal gains will be obtained through the investment of effort (outcome expectations). However, to be self-motivated for the learning process, the requirement to

value the task with skill (intrinsic interests) and to value the process itself (learning goal orientation), needs to be satisfied. (Zimmerman 2013, 142; Zimmerman 2002, 142.)

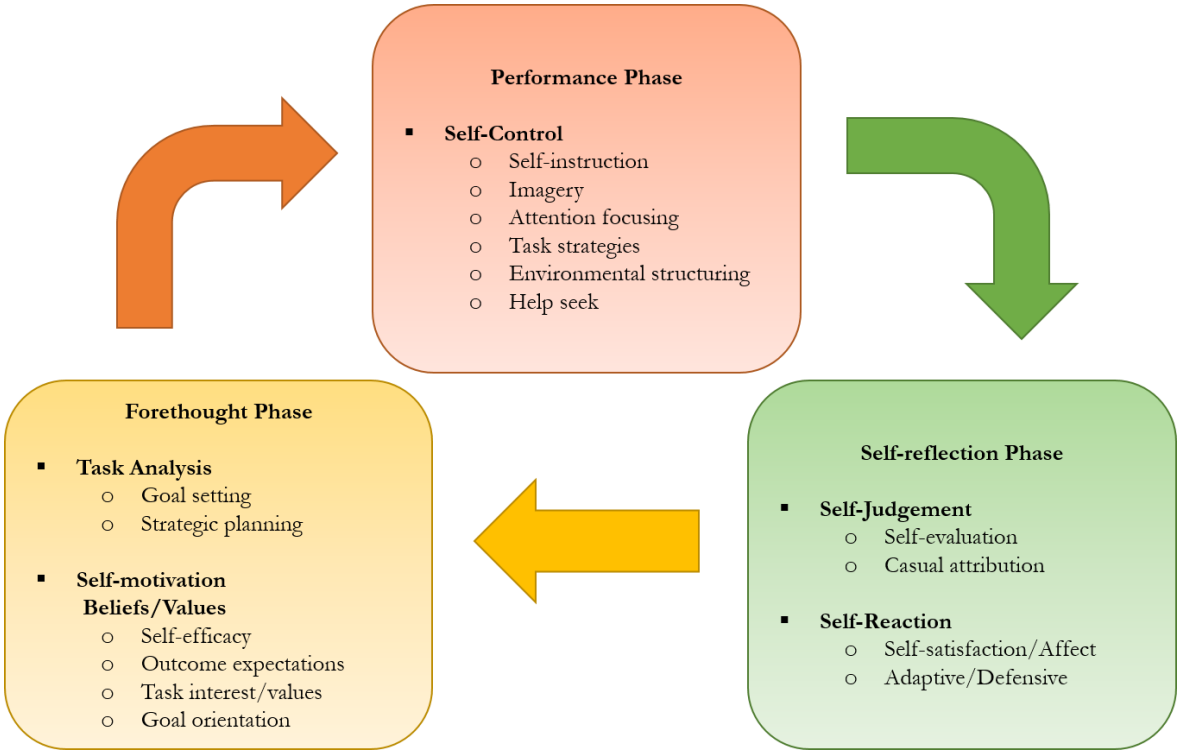

Figure 2. Phases and subprocessess of Self-regulation (Zimmerman 2013, 142).

Following the forethought phase, the performance phase of the self-regulated process is initiated. In this stage the learner starts to invest his own efforts into learning. The phase is constituted from two major classes of intrinsically-deployed processes. To be effective throughout the learning process, the learner needs to control himself (self-control) by deploying specific methods and mechanisms, selected (self-initiated) in the forethought phase. These mechanisms and methods have been identified as, however are not limited to, the use of imagery, self-instruction, control of attention, and task strategies. In order to effectively execute the learning process, the learner is also required to constantly observe his own initiative (self-observation) about how the learning is accomplished. This is done through constant monitoring (self-monitoring and self-tracking) of one's personal cognitive functioning throughout the learning process, and by self-initiated deployment of experiments leading to optimal solutions for how to obtain knowledge efficiently. (Zimmerman 2002, 68; 2013, 143.)

After learning has taken place, the last phase of the self-regulation processes is initiated to optimize the learner's reactions to the learning outcomes (Zimmerman 2013, 143).

The last part of the learning process takes the learner through the phase of self-reflection. As in the previous two phases, this one is composed of two classes of processes. In the class of the learner's self-judgment, the learner is required to evaluate personal performance during the learning process using standards obtained either from one's past performances, the performances of others, or benchmarks common to all learners targeting the learning domain. The learners can also reflect on their own performance through the application of causal attributes, where the causes for failure or success in the learning process are identified. Identification of the causes why goals were not attained will, following failure, lead the learner to identify new strategies which may lead him towards future success (a positive outcome), or may shift him to understand that any additional effort invested into the learning process will not elicit improvements, resulting in a negative effect on motivation and a dropout from the process (a negative outcome).

The second class of this process targets the reaction (self-reaction) of the learner after the previous class has been fully implemented. After evaluation of personal performance, and identification of the progress made after learning, improvement in the level of performance will lead to an increase in personal satisfaction (self-satisfaction), in turn leading to re-initiation of the whole cycle. A decrease in personal satisfaction will, on the other hand, lead to personal defensive reactions, in which withdrawal from learning process will occur (a negative outcome), or adaptive reactions, in which modification of learning strategies will occur to increase learning efficiency (a positive outcome), resulting in continuation of the cycle. (Zimmerman 1989, 335; 2002 68; 2013, 143.)

2.3.2 Self-regulation skill and transference in the sport setting

Based on self-regulation theory and the identified self-regulated learning process, predispositional skills are identified for each phase, which the individual is required to develop through time and continuously deploy. (Jonker 2011, 12.) This makes the learner

metacognitively, motivationally, and behaviourally engaged in his own learning process. (Zimmerman 1986, 308.) These skills are required for the use and transfer of the learner's own metacognitive knowledge (knowledge on general and specific learning strategies and knowledge about skill) into a new learning opportunity (Ertme & Newbym 1996, 8).

In order for the learner to be metacognitively proactive in his learning process, the use of skills is required. These include planning, i.e., creating plans that carefully match task requirements within the learner's available resources for goal attainment, self-monitoring, i.e., awareness of actions executed throughout the process, and self-evaluation, i.e., the ability to execute post-performance evaluation and the identify result after the executed process. These skills are needed across timespan and need to be implemented regularly. (Zimmerman 1990, 14; Ertme & Newby 1996 11; Hong & O'Neil 2001, 191.)

However, for the learner to successfully connect the thought (metacognitive knowledge) and action (deployment of self-regulation skills), constant self-reflection is required (i.e., ability to self-reflect on obtained knowledge and experiences for their transfer to future learning). This allows for consideration of plans established in the forethought phase, for evaluation and adjustment while learning in the performance phase, and for revision of the process at the end of the learning process in the self-reflection phase (Ertme & Newby 1996, 15). Mastered skills, with constant self-reflection and sufficient amount of metacognitive knowledge (Figure 3), will further help the learner to learn more efficiently (Jonker et al. 2015, 319).

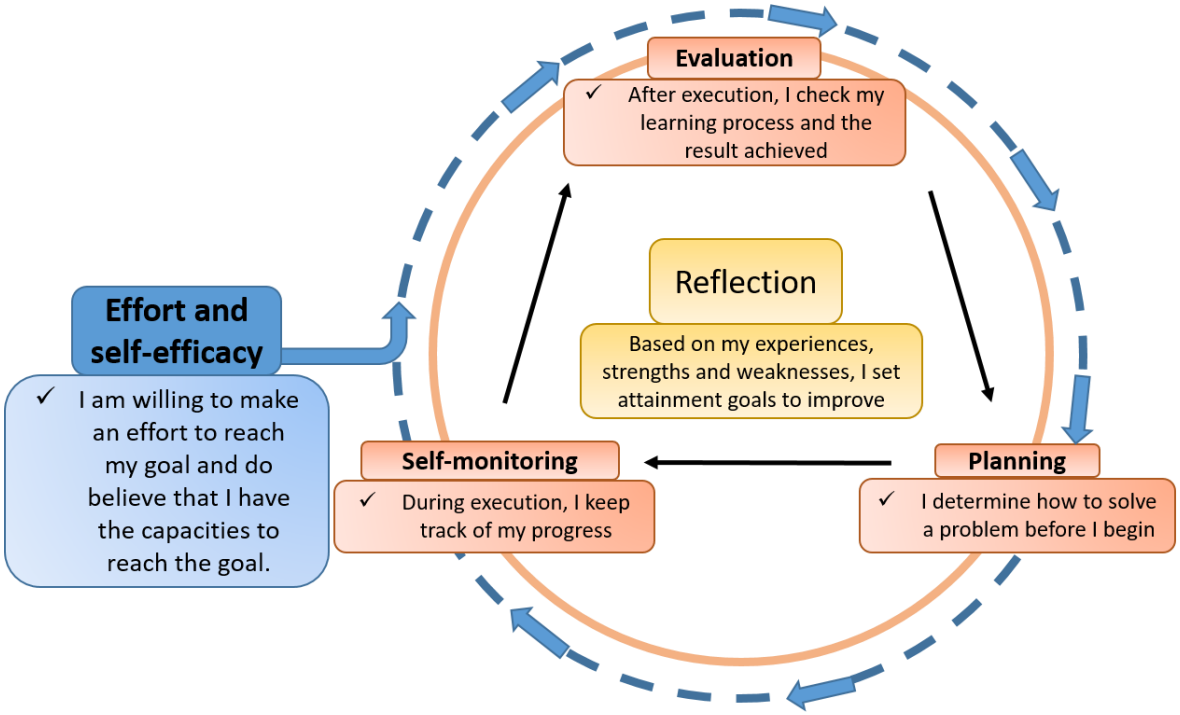

Figure 3. Self-regulatory process skills in phases, in self-regulation in sports education (Jonker 2012, 12).

While the self-regulatory process has mainly been identified from the academic environment, studies have shown support for the importance and transference of self-regulation skills into sports settings across multiple sport-domains.

Research has found that expert athletes distinguish themselves from non-expert or novice athletes by setting more specific goals, selecting technique-oriented strategies, and in general display higher levels of self-efficacy (Cleary & Zimmerman 2001, 204). Furthermore, results from previous research also revealed differences in relationship between the forethought phase and the self-reflection process among the three types of athletes (expert, amateur, and novice), leading to the conclusion that expert athletes display a higher quality of self-regulation skills.

The value of self-regulation skills in sports has also been identified as distinguishing differences among talented youth athletes participating in various competitive levels and types of sport.

Athletes taking part in international competition reflected more on their past performance and learning processes than athletes participating at the national level, suggesting that international athletes learn more efficiently. However the origin of these reflective practices has not been identified. It has been speculated that high reflective capabilities might originate from a well-developed sense of reflection or were due to exposure to international experiences. Athletes participating in individual sports also outperformed team-sport athletes in planning and effort put into one's development. (Jonker, Elferink-Gemser & Visscher 2010, 907; Toering, Elferinkg-Gemser, Jorder & Visscher 2009, 70.)

The findings indicate, that sport practitioners working with aspiring athletes from the early beginnings, are required to use and develop practices where athletes are granted opportunities to develop reflective capacities and master self-regulation skills in order to achieve full potential and successfully transition to senior competition. To achieve this, the practices deployed by the practitioner (training methods and development opportunities) and the environmental structure must shift towards personal and athlete-centered approaches, where the athlete takes control of his own development, irrelevant of the involved sport, i.e., irrelevant if it is a team or individual sport. Deployed practices should aim to assist an athlete in setting personal goals of attainment based on the athlete's willingness to invest, personal strengths and weaknesses, level of competition, and the joint assessment of various improvement possibilities coming from shared reflective thinking. (Jonker, Elferink-Gemset, Visscher 2011, 131; Jonker, Eferink-Gemser, Roos & Visscher 2011, 175.)

2.4 Personal Construct Theory--Basis for individual approach to development

The sport practitioner's generally accepted role is to assist an athlete in the process of achieving a higher state of performance. This is done through deployment of optimal learning mechanisms, a well-developed relationship, mutual understanding on performance requirements, and distribution and implementation of resources to create the development process (Butler et al. 1992, 254).

In order to provide appropriate guidance and create the development process, optimal mechanisms for learning need to be selected which incorporate the athlete's views on required performance standards and his needs. It is also important to be aware that the perception of the athlete's weaknesses, strengths and performance standards as identified by the sport practitioner may differ compared to the ones identified by the athlete, and might lead him to frustration and reduced commitment to the process (Doyle & Parfitt 1997, 411).

The reasons differences might occur in understanding performance standards and the athlete's needs can be found in the Personal Construct Theory (PCT), established by George A. Kelly in 1995. This theory postulates that individuals differ in their perception, interpretation, and importance given to different situations (Doyle & Parffit 1999, 115). Despite the notion that there might be some similarities in situational interpretation among them, each individual uniquely interprets events, where meaning dictates unique behaviours in one's own world. (Weston, Greenles, Thelwell 2011, 173; Gucciardi & Gordon 2009, 19.)

How one personally interprets events is through the identification of constructs, building personal theories which try to make sense of the world. One's established personal theories are then allowed to forecast what will happen in any given situation, leading to theory validation or revision, consequently guiding the person to see into the immediate or long-term future, further directing behaviour. Therefore, the uniqueness of the selected constructs inside a developed theory exemplifies that each individual differs in how a situation is recognized and understood, what is important to them, and how each event is interpreted (Butler & Hardy 1992, 254).

Transferred into the sport environment, this requires sport practitioners to treat and understand each athlete as an individually independent entity, in which each constructs a unique theory of his own multidimensional performance. Using this philosophy as a basis for program development further allows an athlete to autonomously create theory about his own identity through the personal construct system, identifying constructs

for the physiological, psychological, technical, and tactical aspects of the sports performance (Butler et al. 1992, 254).

One approach, which includes the athlete in the decision-making process, helps to identify self-determined meaningful constructs, and bring the athlete and the sport practitioner onto the "same page", is the performance profile strategy. (Butler 1992; Dale & Wrisberg 1996.) This strategy has proven to be valid and has been successfully deployed across multiple sports (Doyle & Parfitt 1997, 411; Weston, Greenlees & Thelwell 2011a, 173; Gleeson, Partfitt, Doyle & Rees 2005, 66; Jones 1993, 160; Newman & Crespo 2008, 12.) and in various other performance domains. (Doyle & Parfitt, 1999 115; Jones 1993, 160.)

2.4.1 Performance profiling

The performance profile is essentially a strategy where the sports practitioner tries to develop an understanding of the athlete's perception of performance through the expansion of focus, identification of constructs, and inclusive involvement of the athlete in the decision-making process for his own development (Butler et al. 1992, 263). It is also a method which is used to increase an individual's self-awareness of the qualities required to produce top performance and assessment of self (Doyle & Parfitt 1999, 115).

This essential approach to the athlete's development has been established as the basis of the Personal Construct Theory-PCT. (Kelly 1955.) The performance profile strategy acts as a catalyst to map the athlete's personal construct system onto a performance profile, where the athlete's subjective evaluation scores are marked in bipolar relationship to optimal performance (Doyle & Parfitt 1997, 413). This illustrates the athlete's perceived strengths and weaknesses in terms meaningful to the athlete (Butler & Hardy 1992 257), enabling initiation of specific training targeting weaknesses.

Furthermore, allowing the athlete to explore his own perspective of performance through creation of the performance profile enables the sports practitioner to recog-

nize possible hidden gaps in the mutual understanding of required performance standards. The discussion facilitating nature of the profile elicits improvement in the athlete's self-awareness and self-perception, identifies feelings about the athlete's personal performance, and assists in the mutual goal-setting process. (Gucciardi & Gordon, 2009 22; Doyle et al. 1997, 412.)

Completion of the performance profile, with effective involvement of the athlete in the decision-making process and as a regular participant in discussion on the performance profile outcome, serves as the premise for an individual approach in the development program structure and its implementation, targets the identified areas of perceived needs of the athlete (Butler et al. 1992, Weston et al. 2011), and subsequently enhances the athlete's intrinsic motivation (Jones 1993, 171).

Although the performance profiling strategy was designed as a one-to-one approach (sports practitioner to athlete), it can also be adapted to a group setting. Performance profiling intervention on a team level follows the same procedure and ideology as in an individual approach, but with the constructs identifying the needs of the team in pursuit of high performance group standards. Athletes belonging to the group are asked to identify constructs for each aspect of the team's performance, according to what they believe is representative of successful teams. In addition, this process can allow for the creation of the optimal atmosphere, in which sport practitioners and athletes identify and openly discuss areas in need of improvement and goal establishment (Dale et al. 1996).

The crucial benefits of the use of performance profiling for the athlete development process have been summarized in the text written by Jones (1993, 162).

- Maximizes athlete's motivation for training and development process
- Allows for-self-determined development
- Acts as catalyst for effective goal-setting and identfication of goal attainment strategies

- Can be used as monitoring mechanism trhough percieved changes in performance improvement and goal attainment
- Serves as feedback tool
- Allows for coaches to understand athlete's self-perception, and athlete's coaches perception of him.

2.4.2 Performance profile procedure

Creating the performance profile is fairly simple. As described in the literature (Butler et al. 1992), the process starts with the introduction of the performance profile and the benefits the athletes might gain upon completion of the strategy. As it has been noted, the strategy may improve one's self-awareness and help to determine the development process according to personal perceived needs. It is also important to clarify to athletes that there are no right or wrong answers and that the profile tries to uncover constructs based on the athlete's opinion of what is important for their own performance.

Athletes are then ask to identify constructs belonging to the physiological, psychological, technical, and tactical aspects of the sport and are, according to them, perceived to be the constructs of an elite performer. If athletes have difficulty in generating them, the sports practitioner can assist, requesting them to think about their sports role models and characteristics which make them successful. The sports practitioner can further ask participating athletes to underpin each construct with a concrete example and description targeting the sport-specific environment. This clarifies and bridges any gaps in understanding, bringing both parties involved onto the "same page". (Butler et al. 1992; Newman et al. 2008.)

Once the discussion is completed and the important constructs are identified, athletes are asked to identify on the scale from 1 (lowest) to 10 (highest) – the ideal performance standard. (Newman et al. 2008; Weston et al. 2011.) They are also encouraged to subjectively rate where they perceive they currently stand on each construct (Butler et al. 1992). All obtained information (constructs, ideal performance standards, and current perceived level) is then displayed around the boundary of the performance profile (Gleeson et al. 2005) as presented in Figure 4. It should be noted that the profile

displayed as a 360-degree circular chart is only one of many options how profiling can be displayed. Other versions can be seen in the literature (Butler et al. 1992).

Identification of the athlete's perceived needs is then made with the discrepancy scores or by visual identification. The discrepancy score for each construct is calculated by subtracting the score of the current perceived level for each construct from the ideal performance standard score. The higher the score, the greater need for the athlete to attain the higher performance level (Doyle et al. 1997).

Once the whole process is complete, the practitioner and the athlete start to identify the development process of how to reach higher scores of the athlete's personal performance.

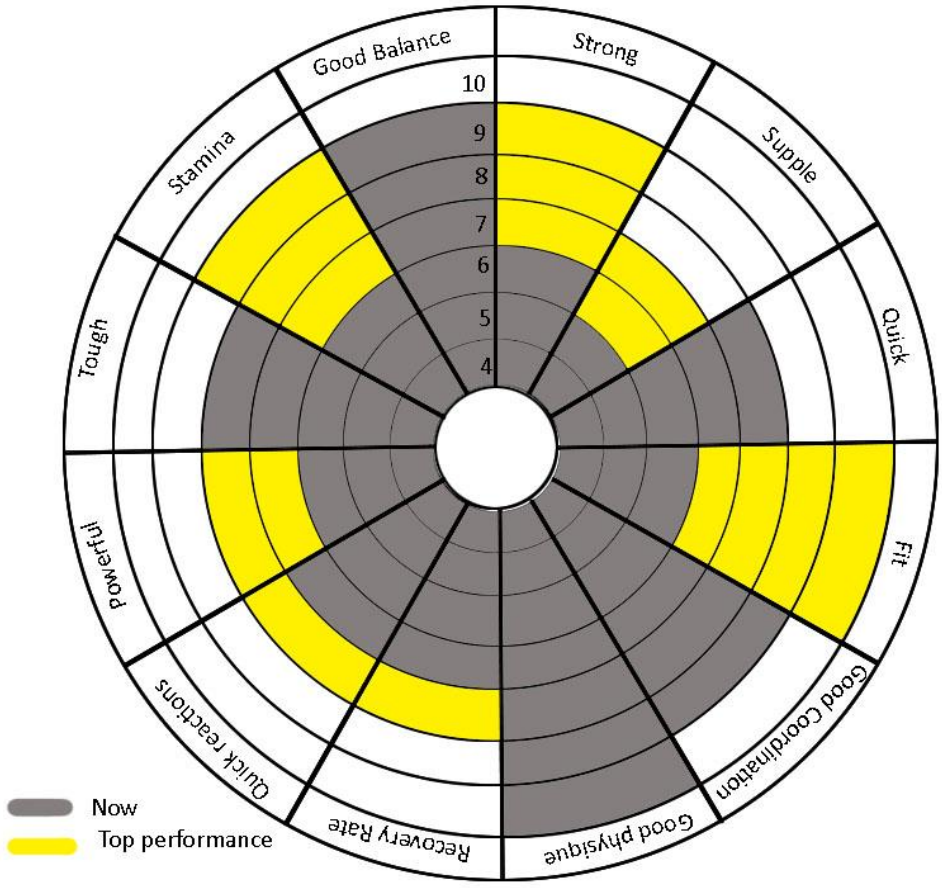

Figure 4. Example of completed performance profile. The highest perceived need for improvement is identified for the construct FIT.

3 From theory to practice

3.1 Framework structure

As identified in the literature, there are numerous factors which affect player development and rate of progress. However, at the end of the day, it is the sports practitioners' responsibility (coaches) to decide the grounds and mechanisms used and implemented for continuous development processes, allowing athletes to effectively progress through the micro and macro stages of career development. This can be achieved by creating sport-specific developmental experiences, support channels, and by the use of guidance in an autonomy-emphasized environment, allowing athletes to take ownership for their own development through the use of self-regulatory skills.

With this approach to individual development, the framework's core process was built around an athlete's constant reflection on athletic performance and the development of personal identity, which was subdivided into the three multi-dimensional performance characteristic. With the help of the identified mechanism for self-determined development (the modified performance profiling strategy), the athlete was required to reflect on the strengths and weaknesses on each aspect of self-identity and, with the help of the coach's interconnected resources, identify process goals and create goal-attainment plans (with subjective and objective progress monitoring mechanisms). The whole process was cyclical, repeated multiple times per season.

With the help of the coach, this dynamic process allowed modification of the content multiple times during the season to meet the athlete's needs and rate of progress.

3.2 Cyclical implementation of the framework

In order for the athlete to have continuous development, with reviews at given times throughout the season, and to outline further steps, the framework needed to be consecutively implemented multiple times, with the athlete's process re-evaluated and the framework modified.

To achieve this, the team's seasonal schedule needed to be divided into multiple cycles, where the micro unit of each cycle's plan was determined by the long-term goal, however with the process dictating the rhythm. The length of each cycle was determined by the coaching staff and was based on the amount of games the team had scheduled for the season (national team breaks included), the off-ice training periodization plan to follow established principles of physiological development/adaptation (Bompa & Buzzichelli 2015), and the team's on-ice development plan.

Each cycle ended with the game performance and with either targeted or general testing. Targeted Tests (TT) included physiological testing of the athlete's chosen physiological capacity for the given cycle. General Tests (GT) included the capacities needed to re-identify the current level of the overall profile. The exact length of each cycle, the number of games, the position of physiological testing (TT & GT), and the schedule of general individual meetings is presented in Table 1.

The whole season (pre-season and in season) was divided into 8 cycles. The first cycle started with pre-season, an introductory cycle lasting 5 weeks. Athletes got to know the development process (the established framework) for the upcoming season. If they agreed to participate in this type of personal developmental opportunity, the athlete's starting point of development was identified. The introductory cycle consisted of an introduction to the framework's structure, the cyclical nature of its implementation, the introduction of responsibilities, the degree of commitment to specific tasks from the coach's and player's perspective, the potential benefits in pursuing long-term goals and, most important, the regular, daily experience of the framework. This cycle lasted five weeks with eight friendly games, which was long enough for athletes to have the opportunity to experience the framework in real-time, in a specific environment, and on a regular basis. Given this, once the season began, the actual process did not place additional stress on the athlete. This cycle also presented the coaching staff with a window of opportunity to guide and assist an athlete on specific issues that came up, which exposed the athlete to the novel development process for the first time.

Table 1. The exact length of each cycle, the number of games, the position of physiological testing, and the schedule of general individual meetings.

Cycle	Week	Games	Physiological testing	General individual meeting
Introductory	31-35	8 games	Week 31 - GT	Week 32
1. Cycle	36-39	8 games	Week 39 -TT	Week 36
2. Cycle	40-44	8 games	Week 44 – GT	Week 40
3. Cycle	45-48	7 games	No tests	No meeting
4. Cycle	49-52	7 games	Week 49 – TT	Week 49
5. Cycle	53-3	6 games	Week 53 – TT	Week 1
6. Cycle	4-7	4 games	Week 6 – TT	Week 7
7. Cycle	8-11	8 games	Week 8 - GT	Week 12 – Player process review

However, preceding the real-time implementation of the framework, it was essential to identify the starting point for the athlete's development for the upcoming season using the process discussed in the next section.

3.3 Identification of the starting point for the athlete's development

Identification of the starting point for the athlete's development was done from multiple perspectives by creating a player performance profile where characteristics were subjectively and objectively evaluated. Areas of profiling included multidimensional performance characteristics: the tactical with technical, psychological and physiological.

To obtain the current levels of the athlete's physiological domain, the coaching staff used week 31 for a general physiological screening (objective evaluation) of the entire team. Players needed to undertake a series of tests, measuring specific or general neuromuscular, bio-motor, and endurance capacities. All the tests performed were executed either on dryland or on environmentally specific conditions (on-ice). The results were then compared with the optimal results for the given capacity to determine the performance index (PI), which helped the coaching staff and athlete easily identify the athlete's strengths and weaknesses throughout the introductory process. The PI of

each test was calculated by dividing the athlete's result by the optimal result (gold standard), identified through academic research papers or established as the gold standard by the Finnish Ice Hockey Association. Analysis of each athlete's results was discussed the following week as part of outlining the athlete's profile. The physiological screening period lasted five days. This ensured sufficient recovery between tests to minimize the risk of measured capacities interfering with one another, possibly skewing results.

During week 32, the coaching staff proceeded with the first individual meetings. Athletes established and evaluated the characteristics of their own athletic profile, targeting psychological, technical/tactical aspects, and scrutinizing performance indexes from the physiological profiling. With an established profile, athletes developed a starting point for the development process and produced a development plan for the duration of the cycle.

The meeting started with profiling elite athletes, i.e., players who performed at the highest levels of their professional sport. The meeting participants were asked to brainstorm in order to identify three specific aspects of the profile, which they thought characterized an elite player as a person, athlete and player. They were then asked to explore each characteristic by defining its meaning. The goal of this phase in the introductory cycle was to guide the athlete towards the discovery of what player identity exemplifies, everything that needs to be reflected in the process of high performance attainment (development), and to constantly perform up to one's full potential. This part of the discussion also served to create a communication channel between the athlete and his coach, indirectly laying the basis for the next step of the meeting, and allowed coaches to evaluate the athlete's level of understanding about high-level performance and its meaning. Following this discussion, the athlete was asked, with the coach's guidance, to discuss each aspect of his own profile.

Profiling the athlete's psychological aspect of performance was done through a series of spontaneous questions, asked verbally. The aim was to concretely identify, expand,

and objectively evaluate characteristics which the athlete believed important in performing up to his full potential on a regular daily basis in training, games and life outside the ice hockey rink. Each identified psychological characteristic was then further explored as to its origin and meaning, reinforced with concrete examples how it showed up in one's habits, values, or actions inside and outside sports. (For example, Commitment → dedication to team rules, living an athlete's life, performing the drill until the end → being on time for team meetings, going to bed consistently at 23:00, battling after a loose puck and winning it back). Besides establishing the profile and determining the starting point for the development of this aspect, the goal of this part of the discussion was to raise the athlete's awareness of important characteristics which were not fully recognized up to now and to affect development and successful performance, arising not just from tactical, technical, or physiological aspects, but also from psychological. The discussion also assisted coaches in better understanding the athlete's mind, and to identify possible factors which might lead to performance slumps during the season. This helped them to design tailor-made psychological skills training, if needed.

The second segment of the individual meeting aimed to introduce and discuss with each athlete his personal physiological profile. It started with discussion on areas which belong to the physiological domain of an athlete's development, in order to identify and increase the level of knowledge and awareness of this important domain. It should be noted, however, that in the pre-summer and post-summer periods, the coaching staff already integrated some of this material into lectures, so athletes were already familiar with essential physiological development topics. So this part of the meeting served, more or less, for memory recall and reinforcement. Performance indexes were obtained in week 31. Discussion followed, with analysis of the athlete's strengths and weaknesses, and the recognition of the connection of these performance indexes to the player's identity and to how they affect on-ice performance.

The third and last part of discussion of the athlete's profile was aimed at the sport's specific breakdown of the tactical/technical aspects (the section of the profile called game identity). The athletes identified as many tactical characteristics as possible out of

a total of four game situational roles. As in previously discussed aspects of the profile, they were asked to further go into detail about the specific characteristic using concrete descriptions to identify the tactical or technical skills needed for optimal execution.

After the introductory process described above, the athletes obtained a good understanding of the factors directly and indirectly affecting sports performance. Then they expanded on them, clearly identified their meaning, and how they related to on-ice execution. The athletes' understanding of personal strengths and weaknesses in all three aspects was a precondition for the framework to be implemented.

Upon completion of the meetings, athletes were given the Individual Development Process form (Attachment 1) as a take-home assignment. As already mentioned, it represented the core framework, in which athletes needed to make a decision about what to focus on during their development in the upcoming cycle. They did so by volition--choosing the characteristics for each section of the profile and writing down the required information after a period of reflection.

3.4 Reflection: Making a choice

The Individual Development paper contained three major areas which served as a precondition for the whole process. First, the athlete needed to reflect on each aspect of the performance profile and choose concrete characteristics in need of improvement or observation for the duration of the cycle.

The section devoted to improvement of the technical and tactical aspects was divided into four different situational roles. They were first asked to identify one characteristic for each given role, the location where it happens (offensive zone, defensive zone, or neutral zone), and evaluate on a 10-point Likert scale (1--really bad, 10--the highest) their current level of performance.

Following this was the physiological aspect of the Individual Development Process paper, which athletes filled out by identifying a maximum of two physiological capacities

they wanted to improve in the following cycle. Usually the decision was straightforward, since it was directly connected to the physiological screening period (performance index value) and was subordinated to the exercise physiology principles of neuromuscular and cardiovascular development.

In the last section, which targeted the psychological aspect, athletes identified a maximum of five mental characteristics they wanted to explore or to maintain for the period of the cycle. As in the first section, athletes were also asked to subjectively evaluate their current state on a 10-point Likert scale.

Upon completion of the Individual development paper, players needed to schedule another meeting with the coaching staff for planning the development process.

3.5 Planning: Identifying the route towards improvement

Meeting the aims to establish the plan for the development process had, as in other phases, a significant role in the athlete's development. This was where the actual implementation process was established, before it was transferred into regular daily implementation. Athletes were asked to discuss the Individual development paper, focusing on each of the three aspects, and establish the plan for development. This is done together with the coach, but the athlete himself had a major say in how the higher levels of performance would be attained.

As written in the Individual Development Process paper, the technical/tactical aspect (GAME) was the first where a development plan needed to be outlined indicating how to improve individual performance in this area. However, before this whole planning process could be established, the profile required a coach to help with the athlete's evaluation. Coaches were defined as experts in their field, those having the knowledge to realistically evaluate the athlete's performance, and to help with resources in the performance standard attainment process during a predetermined time frame. Evaluation of an athlete's characteristics and discussing the difference in evaluation scores gave the coach and athlete a chance to get on the "same page". Sometimes athletes unrealis-

tically evaluated their own performance, either underrating or overrating each characteristic. In these cases the coach tried to identify why the athlete provided such a score, discussed the time span of his subjective evaluation, and identified what it would take for the characteristic to improve. Once a misconception was clarified, establishing the plan to improve proceeded.

The framework offered athletes the option to take full ownership for their development by creating individual environment-specific exercises for each game-specific role (Attachment 2). Then the created exercises were implemented, with individual development time offered inside the scheduled team practice (duration of 10-15 minutes, 2-3 times a week). This ensured an optimal window of time for the athlete to practice a specific aspect of his tactical/technical game, which otherwise might have been neglected inside the team's training practice selection.

Following this was the physiological aspect (SKATING). Once the athlete had chosen two physiological capacities, a training program aimed at improving them needed to be determined. First, the athlete was asked to identify the mechanism to monitor pre- and post-cycle measurement (targeted tests). This allowed him to obtain the performance indexes, which determined the effectiveness of the implemented program and to monitor progress, marking them in the appropriate spaces on the second page of the Individual Player Development paper. Next, the athlete's training units were established at the micro level of the plan. Athletes were offered multiple options how to reach the desired improvements in specific areas.

One option was for the athlete to have full autonomy to determine the structure of the program. However, this was risky, since the program underwent trial and error as the athlete explored its potential. In this case, the coach's responsibility was to provide a recap, indicating how selected capacities are developed (the exercise database, amount of exercises, exercise volume and intensity, rest periods, etc.), using clear examples from the training structures and the weekly vs. daily periodization of training intensity. Once the program was established, it was the coach's responsibility to review it and de-

termine if there was interference within the structure which might lead to a lower performance on game day, stagnant development or, in the worst case, lead the athlete to experience constant neuromuscular fatigue, resulting in burnout.

Another option in planning physiological development was the partial involvement of the player in planning. Athletes were asked to identify one major and one assisting exercise to perform, in addition to the general program for the team. The need to identify the volume and intensity of both exercises, with rest periods each week of the cycle's duration, allowed a certain degree of autonomy. The selected exercises were then, as a pre-training unit, integrated into the team training program. It was the athlete's responsibility to perform the exercises according to the goals of the general training program.

The development of the psychological aspect (CHARACTER) was the last part of the planning process. After reviewing the characteristics the athlete had chosen to be important to performance, two different approaches were used. First, for higher ranked characteristics, the athlete needed to explain why the evaluation was optimal. In doing so, he identified the pre-steps taken before competition or training to develop this optimal functioning. The same approach was then used to identify characteristics which scored lower, with the coach helping to identify and expand. After the whole psychological aspect had been discussed, the athlete chose characteristics he wanted to work on, and established a plan for improvement.

Besides implementing psychological skills training, another option to help an athlete improve was to profile (using the performance profile strategy). Every aspect of this built given characteristics by establishing specific process goals to develop routine habits.

Once the development plan was established, practical implementation started for the cycle. The athlete was given full freedom in execution of the plan. However, progress needed to be monitored to identify whether the development process worked.

3.6 Self-monitoring

For this reason, after the identification of the athlete's profile and creation of the plan, a self-monitoring system was established. To make this as practical as possible, two different online-based services were used. Two databases needed to be created: one to serve as data gathering for subjective evaluation with analysis, the other for visual performance review.

The coaching staff identified Google Drive – Forms (Google Inc.) as the most appropriate objective evaluation of performance. It is practical, with easy to use user interface, data gathering, and form distribution. Forms are automatically connected to the database, which provides up-to-date data analysis. For the visual performance review, the cloud-based online service, One Drive (Microsoft), was used. It served as a video library, where athletes had access to their own performance during the game. Both services are free of charge, alleviating extra costs to the team's budget.

As previously noted in the planning of development section, players already identified a monitoring mechanism in the physiological domain in the form of pre and post cycle testing, where performance was objectively evaluated. The technical/tactical and psychological aspects, on the other hand, required subjective evaluation on a weekly basis, since they related to in-game performance.

Google Forms was used to produce the subjective evaluation of the latter two aspects. All characteristics were evaluated on a 10-point Likert scale (1--really bad, 10--excellent). The coaching staff transferred an athlete's chosen characteristics onto an online evaluation form. In addition, evaluation of the tactical/technical aspect included two open-ended questions, in which the athlete needed to identify three positive aspects of his in-game's performance which could be transferred to the next game, and two which needed to be improved. Once the form was created, the athlete had access to it and its database. Athletes were instructed to honestly evaluate personal performance on their chosen characteristics after every competition. The athlete was also granted access to the video library, in order to access video clips of his performance and, at the same

time, encouraged to pay more attention to reviewing the technical/ tactical characteristics he had chosen for improvement in the given cycle.

This allowed an athlete to self-monitor the development process of all three aspects of the profile, determine which subsequent steps to pay attention to, and constantly be exposed to critical analysis for improvement. From the coach's perspective, this type of monitoring system collected after-game data in one place and was accessible at all times. The scores of all athletes in terms of the psychological and technical/tactical aspects were easily reviewed and reacted to accordingly, if needed.

3.7 **Post cycle and seasonal continuity**

At the end of the cycle, usually after the last competition, there was a recap and future steps were determined by evaluating the past goals and selecting new ones for each chosen aspect of the profile.

The athlete was given the Individual Development Process paper, on which he was required to objectively re-evaluate all selected characteristics of the tactical/technical and mental aspects, i.e., those chosen at the beginning of the cycle. At the same time, following the last game and the recovery day, athletes performed targeted tests related to the physiological aspect, identifying whether they had improved their chosen physiological capacities. Once the data was gathered, the Individual Development Process papers were returned to the coaches, whose responsibility was to objectively re-evaluate the athlete's technical/tactical aspect of the profile and to calculate the average scores from the database information. Average scores were also calculated for the psychological aspect of the profile. The score gathering and re-evaluation procedures were followed by a mutual review of the performance and reflection on the process itself. By sharing opinions and reflecting on the development itself, new standards of performance or characteristics of each aspect were identified and explored, already relating to establishing the process for the next cycle. At the end of the meeting, the player was given a new blank Individual Development Process paper. The same steps were then repeated as previously described in sections 5.4 to 5.6, laying the basis for the new development cycle.

4 Research objectives

The aims of the study were to investigate the effects of the proposed individual development framework applied to a selected junior ice hockey team during one eight-month season. Areas of the author's interest were: (1) identifying the usefulness of the implemented framework with its future implementation potential from the player's perspective, and (2) investigating the effects of the process itself on satisfaction of athlete's basic psychological needs in sports.

Author's research questions of interest:

- Did the players recognize the framework as a useful coaching practice for their development?
- What levels of impact were reached by selecected parameters?
- How much do players believe they could benefit from participation under a similar or the same individual development process?
- To what extend players believe they could benefit on different aspect throughout participation in the future?

The author hypothesized that athletes would recognize the season-long implementation of the Individual development framework as a beneficial strategy for their development with the potential for long-term implementation. It was also hypothesized that exposure to this framework would elicit high levels of relatedness, autonomy and competence, therefore satisfying the basic psychological needs of sport.

5 Design of the study

The aim of this study was to evaluate from multiple perspectives the season-long implementation of a newly established individual development framework into a junior ice hockey team's competitive schedule. In order to obtain player responses on the quality of the process, IDF needed to be implemented into a real environment. This implementation process can be reviewed in Section 3. This case study can be termed action-oriented research, since it includes the establishment of the framework through extensive literature review (planning), framework implementation in a real world setting (action), and subsequent evaluation of results. For the process evaluation, an Individual Development Process Evaluation (IDPE) questionnaire was established on the basis of multiple questionnaires identified in the literature.

6 Methods

6.1 Subjects

A U18 junior ice hockey team from Finland, playing at the highest national level, was selected for the study. Eighteen (N=18) of twenty-four male ice hockey players (six players were excluded by their own volition) participated in a season-long development process. Their chronological age on the date of data collection was (mean±SD) 16.09±0.74 years, and the players had participated in ice hockey-oriented sport activities for an estimated 10.28±1.23 years.

6.2 Data collection and procedure

The data collection period was performed immediately after the last completed cycle of the implemented IDF (after the last game of the season) in order to take advantage of the players' recent experience with IDF. Each player agreeing to participate in the data collection was administrated the questionnaire.

In order to minimize the risk of items being misunderstood due to language differences, before its administration items of the multi-section questionnaire were translated from English into the Finnish language by a native speaking co-worker. Also detailed administration protocol procedures were followed with the coaching staff distributing the questionnaire to the players in a quiet classroom setting after the final individual meeting of the season. These two methods were used in order to minimize distraction and any possible effect it might have on the players' decision-making during the test. Each player was also encouraged to answer the questionnaire honestly and without worry. An adult from the ice hockey setting was present in the classroom to clarify possible questions. This person received instructions from the author not to provide answers in a manner that would change the initial player response to an item on the questionnaire. Upon completion of the administration protocol and return of results, sequential alphabetical letters were assigned to each questionnaire in order to maintain their anonymity. Answers were then transcribed into the electronic version of Excel (Microsoft Office, 2013) for further data analysis.

6.3 Measurement tools

6.3.1 Individual Development Process Evaluation questionnaire

In order to obtain the answers to the author's defined research objectives (see Section 7 for details), a questionnaire with multiple sections needed to be established (Attachment 3). This was necessary because in the literature there was a lack of theme-specific questionnaires directly evaluating the effectiveness of the established framework of this study and answering the specific areas of research. This multi-section questionnaire was written on the basis of multiple scales derived from the literature. These scales also identified what was optimal and efficient for the required measuring characteristics of the research. Items of the scales were rewritten in a manner which targeted the context of the IDF, i.e., were environment specific, but kept the stem of the item the same. The constructed questionnaire was named by this author as the "Individual Development Process Evaluation (IDPE)" in order to make its use easier throughout administration and the analysis process. The two questionnaires serving as a basis for respective items and higher order themes were the AAPQ (Weston et al. 2011) and the BNSS (Ng et al. 2011).

The author divided the IDPE into four sections, together totalling 46 questions, statements and items. The first, second, and third sections of the questionnaire consisted of items modified from the AAPQ. The first section aimed to quantify the athlete's perception of the usefulness (1 item) and belief in the potential future benefits (1 item) of participating in this individual development process. The second section quantified the level of impact the IDF had on nine impact statements. The third section consisted of fifteen statements assessing benefits the athletes believed to be gained from future participation.

The second section of impact statements and third section of statements can be further quantified, with corresponding statements and levels achieved, to obtain global scores on the factors of: motivation, coach-related performance, confidence, self-awareness,

sports-based knowledge, and performance evaluation. Players were asked to respond to each item on a 7-point Likert scale ranging from 1 (not at all) to 7 (very much).

The fourth section, with twenty items modified from BNSSS, aims to identify the athlete's degree of satisfaction of basic psychological needs in the sport during the season through participation in IDF. In order to quantify scores for the sub-constructs on the scale (competence, dimensions of autonomy, relatedness), players needed to identify their feelings of IDF, evaluating given statements using a 7-point Likert scale ranging from 1 (not true at all) to 7 (very true).

6.3.2 Athlete Performance Profile Questionnaire – APPQ and reliability

Two questionnaires served as the basis for the measurement of usefulness and effects for the Individual Development Framework. The first, the Athlete Performance Profile Questionnaire – APPQ (Weston et al., 2011), was modified (making it environment specific) to determine the athlete's perception of the implemented framework. This modified version of APPQ was used for the first three sections of the IDPE. Primarily, APPQ was established in the literature (Weston et al. 2011) to evaluate the perception athletes have from participation in a single performance profiling strategy session led by practitioners. The questionnaire aimed to quantify scores based on athletes' perception of: the usefulness of the performance profile strategy session (1 item), the extent athletes' believe they could benefit from participating in a similar session in the future (1 item), the level of impact the performance profiling session had on nine selected items, and the extent they would benefit from using the performance profile in the future (15 items). Out of the 24 items from the last two aforementioned sections, 18 items were used to quantify the scores on six different factors: motivation (5 items), coach-related performance development (3 items), confidence (2 items), self-awareness (3 items), sports-based knowledge (3 items), and performance evaluation (2 items). Of the remaining ones, 6 items were excluded from the factor loading process (principal factor analysis), since their score was less than 0.40.

As reported by Weston et al. in 2011, APPQ achieved high values of Cronbach Alpha ($\alpha = 0.92$) with its research sample, representing good levels of internal consistency.

Furthermore, the same scholars conducted exploratory factor analysis (EFA) for each factor and item of the questionnaire. Most of these factors indicated good internal reliability, with the values of Cronbach Alpha optimal (α>0.70). On the other hand, the factors "confidence", "self-awareness", and "sports-based knowledge" produced Cronbach Alpha values less than 0.70, indicating these results of the EFA should be evaluated with caution.

6.3.3 Basic Needs Satisfaction in Sport Scale – BNSSS and reliability

The second questionnaire, serving as the basis for the individual development process evaluation for hypothesis testing, was the Basic Needs Satisfaction in Sport Scale – BNSSS (Ng et al., 2011). Items of BNSS were also modified in a manner applicable to the specific context of this research and were placed into the fourth section of the IDPE.

The BNSSS consists of five sub-scales with multiple items that assess competence (5 items), relatedness (5 items), autonomy with perceived locus of causality (3 items), volition (3 items), and perceived choice (4 items). A 7-point Likert scale was used to identify the truthfulness of given items, according to players' feelings and experiences in their main sport, ranging from 1 (not true at all) to 7 (very true). Ng et al. (2011) examined model fit of the five sub-scale factors using confirmatory factor analysis CFI=0.97 and RMSEA=0.06. The Cronbach Alpha score for constructs of BNSSS were competence=0.77, autonomy--perceived choice=0.82, autonomy--IPLOC=0.76, autonomy--volition= 0.61, and relatedness= 0.77. The author concluded that the BNSSS scores were reliable, however scale development is an ongoing process requiring more research to further examine the validity of the instrument.

6.4 Data analysis

The Descriptive Statistics Analysis Toolpack (Microsoft Excel 2013) was used to calculate: mean (M), standard deviations (SD), score range with maximum (Max.) and minimum (Min.), standard error of mean (SEM) and sample variance (S^2) for samples of each construct in the fourth section of the questionnaire. In addition, Z-scores and

frequency distribution statistics were used for per/item and per/player analysis in fourth section.

6.4.1 Results of the Individual Development Process

Descriptive analysis revealed results on the first section (2 items) of the IDPE questionnaire as shown in Table 2. The result from first item, how useful players found the implemented season-round IDP (usefulness of the IDP), was M= 5.39, with a SD of 0.92, and score range of 3 (the lowest) and 6 (the highest). The second item, how much players believed they would benefit from future participation in the same IDP (belief in benefit from future participation in the same IDP), reached a mean score of 5.94, with SD 0.94 and a score range 3 (the lowest) to 7 (the highest).

Table 2. Descriptive analysis of the sample on the usefulness of the implemented IDP and belief in the potential future benefits from participation in the same IDP.

	N	M	SD	Score range	
				Low	High
Usefulness of the IDP	18	5.39	0.92	3	6
Belief in benefit from future participation in the same IDP	18	5.94	0.94	3	7

Furthermore, players' score option selection frequency (f) and its percentile distribution (%) for players' selections (presented in Table 3), indicates most players selected scores in the bottom half of the table with score options greater than 2. Indeed, the majority of the score selection frequency, for Usefulness of the IDP, was above score option 4 (moderate). Score option 6 was selected most frequently (f= 11), representing 61.11% of the total scores, followed by score 5 (f= 4), representing 11.11%. Score option 4 (moderate) represented 11.11% (f= 2) and score 3 (less than moderate) 5.65% (f=1). None of the players selected score 7 (very much). Score selection frequency for players' belief of benefit from participating in a same IDF in the future was similar to the score frequency obtained on the usefulness of the IDP. The most frequently selected score was 6 (f=11), representing 61.11% of the total obtained scores, followed by 7 (very much) (f=4) with 22.22%. After this were scores 5 (f=2), representing

11.11% of all scores, and score 3, selected the least (f=1), representing 5.56%. None of the players selected score 4 (moderate). Furthermore, no scores were selected for scoring option 2 or 1 (not at all) for either question.

Table 3. Players' score option selection frequency (f) and percentile distribution (%) for each scoring option on Usefulness of the IDP and athletes' belief of benefit from future participation in the same IDP.

	Usefulness of the IDP		Belief of benefit from future participation in the same IDP	
	f	(%)	f	%
1- Not at all	0	0.00	0	0.00
2	0	0.00	0	0.00
3	1	5.56	1	5.56
4- Moderate	2	11.11	0	0.00
5	4	22.22	2	11.11
6	11	61.11	11	61.11
7- Very much	0	0.00	4	22.22

The second section investigated the level of impact the implemented IDP had on impact statements. Impact statements were, for the purpose of data analyses, reordered and are presented in Table 4, ranking in order from the highest to the lowest mean (M) score. Standard deviation (SD) values and score range indicate the lowest and highest end of the spectrum. As indicated, there were five impact statements, which had mean scores above 5. Impact statement 2 had the highest mean score of 5.72 (SD=0.90), followed by 5 with a mean score 5.50 (SD=0.99), and impact statement 7 with a mean score of 5.33 (SD=1.14). Impact statements 8 and 6 had the same mean scores of 5.28 and the same standard deviation (SD=1.07). The rest of the four impact statements had mean scores below 5, but above 4 (moderate). The highest mean score of the last 4 was impact statement 4 with a mean score of 4.94 (SD=1.11), followed by 1, with a mean 4.89 (SD=0.90), and impact statement 3 with a mean score of 4.83 (SD=1.10). Of all statements in the second section, the lowest score was impact statement 9 with a mean of 4.61 (SD=1.09). Table 3 shows the statements and scores from the second section of the questionnaire about level of impact.

Table 4. Mean scores, standard deviation, and score range of perceived level of impact on impact statements.

Impact	M	SD	Score range	
			Low	High
2. Helped to highlight my weaknesses	5.72	0.90	4	7
5. It helped to highlight strategies to improve	5.50	0.99	4	7
7. It was a catalyst to help improve myself	5.33	1.14	2	7
8. It made me think about setting goals	5.28	1.07	4	7
6. It helped to enhance my confidence in my ability	5.28	1.07	2	6
4. It helped to get something down on paper	4.94	1.11	2	6
1. Helped to highlight my strengths	4.89	0.90	3	6
3. Helped to highlight the demands of my position	4.83	1.10	2	7
9. Helped to highlight the demands of other positions	4.61	1.09	3	7

The third section of the questionnaire, with fifteen statements, investigated how much players believed they would benefit from this type of IDP in the future. For the results and wording of statements, observe Table 5. The same procedure used in the second section was again used to obtain descriptive statistics for each statement. The highest and only statement reaching a mean score above 6 was statement 14, with a mean score of 6.11 (SD=0.83). The rest of the statements had mean score values between 5 and 6. The second highest mean score was statement 5, with a mean of 5.78 (SD=1.17), followed by statements 3 and 2, with the same mean score of 5.72 but different standard deviations (SD=1.02, SD=1.07). Statements 12 and 13, with the same mean score of 5.61, had similar standard deviations (SD=1.14, SD=1.24). After this were statements 11, with a mean score of 5.56 (SD=0.98), and statement 10, with a mean score of 5.50 (SD=1.04). Statements 9, 8, 15 all had the same mean score of 5.44,

with similar standard deviations (SD=1.10, SD= 1.15, SD=1.15). Statements 1, 4, and 6 had the same mean score of 5.33 and disparate standard deviations (SD= 1.08, SD=1.41, SD=1.14). The lowest mean score of 5.28 (SD=1.41) came from statement 7.

Table 5. Descriptive results of the perceived level of belief in potential benefits of participation in the same IDP in the future and the score range for each statement.

Benefits from participation in the same IDP in the future	M	SD	Score Range	
			Min.	Max.
14. To record my improvements	6.11	0.83	5	7
5. To set goals for myself	5.78	1.17	4	7
3. To monitor progress	5.72	1.02	3	7
2. To help decide what I need to work on	5.72	1.07	3	7
12. To improve the coach's understanding of me	5.61	1.14	3	7
13. To provide after game analysis	5.61	1.24	2	7
11. To help the coach individualize my training	5.56	0.98	3	7
10. To help in the evaluation of my performance	5.50	1.04	3	7
9. To structure my training schedule	5.44	1.10	3	7
8. To motivate me to improve	5.44	1.15	2	7
15. To take more responsibility for my development	5.44	1.15	3	7
1. To build my confidence	5.33	1.08	2	6
4. To aid communication with my coach	5.33	1.41	1	7
6. To take more control of my development	5.33	1.14	3	7
7. To motivate me to train	5.28	1.13	2	7

The mean scores from each player in the second section of the questionnaire, identifying the scores on impact statements, and on statements from the third section were further combined (the mean scores for corresponding statements), in order to determine the global impact of the IDP on six constructs: confidence, self-awareness, motivation, sports-based knowledge, coach-related performance development, and performance evaluation. The global score on construct confidence was calculated by taking the mean of impact statement 6 (from the second section of the questionnaire) and statement 1 (third section). The self-awareness score was calculated from impact statements 1 and 2 (second section), and from statement 2 (third section). Construct motivation comprises only statements 5, 6, 7, and 8 (second section), while the sports-based knowledge construct takes into account mean scores of impact statements 3, 5, 9 (second section). Coach-related performance development is compiled only from the mean scores on statements 4, 11, 12 (third section), as well as performance evaluation with means on statements 13 and 14.

Table 6 presents the global mean scores for each construct from corresponding impact/future benefit statements. In the table, two numbers separated by a colon indicate the section number of the questionnaire, followed by the order of the statement. The highest score was obtained for the construct performance evaluation (M_c=5.86) followed by coach-related performance (M_c=5.50), motivation (M_c=5.46), self-awareness (M_c=5.44), and confidence (M_c=5.44). The lowest score, and the only score below 5, was for the construct sports-based knowledge (M_c= 4.98).

Table 6. Mean scores measuring the global impact of the IDP on the constructs confidence, self-awareness, motivation, sports-based knowledge, coach-related performance development, and performance evaluation.

Construct with impact/future benefit statement	M_s	M_c
Confidence		5.31
2:6 It helped me to enhance my confidence in my ability	5.28	
3:1 To build my confidence	5.33	
Self-awareness		5.44
2:1 Helped to highlight my strengths	4.89	
2:2 Helped to highlight my weaknesses	5.72	
3:1 To help me decide what I need to work on	5.72	
Motivation		5.46
3:5 To set goals for myself	5.78	
3:6 To take more control of my development	5.33	
3:7 To motivate me to train	5.28	
3:8 To motivate me to improve	5.44	
3:15 To take more responsibility for my development	5.44	
Sports-based knowledge		4.98
2:3 Helped to highlight the demands of my position	4.83	
2:5 It helped to highlight strategies to improve	5.50	
2:9 Helped to highlight the demands of other position	4.61	
Coach-related performance development		5.50
3:4 To aid communication with my coach	5.33	
3:11 To help the coach individualize my training	5.56	
3:12 To improve the coach's understanding of me	5.61	
Performance evaluation		5.86
3:13 To provide after game analysis	5.61	
3:14 To record my improvements	6.11	

Note: M_s – Mean score of each impact/future benefit statement, M_c – Global mean score of the construct derived from M_s.

6.4.2 Results on satisfaction of basic psychological needs while participating in IDF

Instructions, and a scoring key on how to obtain the scores for competence, autonomy with its dimensions, and relatedness, were obtained directly from the author of the BNSSS. The scores are presented in Table 7.

The competence (COM) score was comprised of the mean scores from the five competence items 6, 11, 12, 14, and 17. The general autonomy (A) score was obtained by taking the mean score from the means of each dimension of autonomy for each player: perceived choice (A-PC) with items 4, 9, 13, and 20; volition (A-V) with items 3, 5 (reversed coding item), and 8; and internal perceived locus of causality (A-IPLOC) with a mean score derived from items 2, 15, and 16. The perceived relatedness (REL) score was calculated with the mean scores from items 1, 7, 10, 18, and 19.

The mean score for competence was 5.13, with a sample standard deviation of 0.93. The autonomy mean score was 5.45, with scores ranging from 3.39 (lowest) to 6.75 (highest), and a standard deviation of 0.86. Sub-dimensions of autonomy (volition, perceived choice, and internal perceived locus of causality) had, by listed order, means of 5.37, 5.49, and 5.49, with standard deviations of 0.97, 0.84, and 0.93. The mean scores ranged from 3.67-7.00, 3.50-6.50, and 3.00-7.00. The mean score for relatedness was 4.82 with a sample standard deviation of 1.05. Table 7 displays the mean, standard deviation, standard error of mean, sample variance, and the score range for the fourth section of the questionnaire.

Table 7**.** Summary of descriptive statistics for each construct on the satisfaction of basic psychological needs through participation in IDF. (Competence-COM, Autonomy –A, Volition – V, Perceived Choice –PC, Internal Perceived Locus of Casualty – IPLOC, Relatedness – REL)

	N	M	SD	SEM	S^2	Score range	
Factors						Min.	Max.
COM	18	5.13	0.93	0.22	0.87	2.20	6.20
A*	18	5.45	0.86	0.20	0.74	3.39	6.75
A-V	18	5.37	0.97	0.23	0.94	3.67	7.00
A-PC	18	5.49	0.84	0.20	0.71	3.50	6.50
A- IPLOC	18	5.49	0.93	0.22	0.87	3.00	7.00
REL	18	4.82	1.05	0.25	1.11	2.00	6.40

Per player analysis of obtained scores from each construct was done with the visual representation of Z-scores plotted on a graph (Figure 5). A Z-score of zero represents the mean score of each construct. Thirteen players scored higher than the mean for competence (M=5.13), with only two of these players (G & N) having scores lying outside one SD unit (SD= 0.93). On the other hand, five players scored below average. The scores of two (I & F) fell outside one SD unit, with player F falling significantly below the mean of the data set (Z=-3.15). For the autonomy aspects of the scale, 10 players scored higher than the mean (M=5.45) of the sample with two players (G & R) plotting outside one SD unit (SD=0.86). Of the remaining eight players scoring below the average of the construct, player F significantly scored below one SD unit (Z=-2.38). For relatedness, 61.11% (N=11) of the players scored above the mean score (M=4.82), with two players (A & G) above one SD unit (SD= 1.05). The rest of the players (N=7) scored below the mean, with four players (F, I, M, and S) falling below one SD unit.

For the construct Competence, players G and N had the highest Z-score (Z=1.15) and player F the lowest (Z=-3.15). For Autonomy, player R had the highest score (Z=1.51) and player F (Z=-2.38) the lowest. Finally, student G had the highest score in the construct Relatedness (Z=1.50), while player F had the lowest (Z=-2.68).

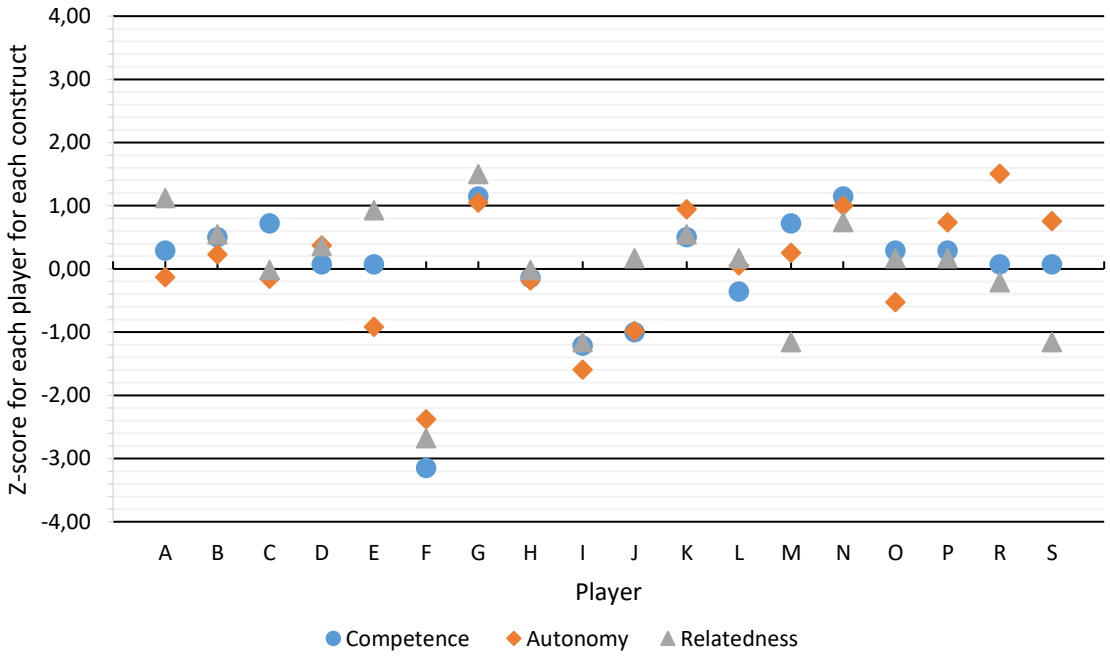

Figure 5. Plotted Z-scores for each player on each construct on a XY-scattered graph. The mean of each construct is represented with the values 0.00 and ±1.00 indicating the amount of SD units player is above or below the mean score.

Itemization of construct scores showing how many times each score was selected for a specific item was calculated and presented in Tables 8 through 10. In addition, the tables show the percentile (%) distribution and SUM, indicating how many times each answer was selected by the players.

For relatedness, shown in Table 8, score 5 was selected 33 (36.67%) times, followed by score 4 (somewhat true) 22 (24.44%) times, with score 6 selected 14 (15.56%) times. Score 2 and 7 (very true) were evenly distributed, each representing 7.78%, followed by the score 3 (6.67%) and the score 1 (not true at all) only once (1.11%). The majority of the selected scores appear in the right half of the table.

Table 8. The distribution and the SUM for the answers of items for the construct Relatedness.

	Relatedness						
Items	Not true at all			Some-what true			Very true
	1	2	3	4	5	6	7
1.	0	1	2	4	7	2	2
7.	1	0	3	6	4	3	1
10.	0	2	0	4	9	2	1
18.	0	3	0	3	8	3	1
19.	0	1	1	5	5	4	2
SUM	1	7	6	22	33	14	7
%	1.11%	7.78%	6.67%	24.44%	36.67%	15.56%	7.78%

Table 9 shows score distribution, SUM and percentile (%) for the construct Competence. The most frequently selected score was 5, representing 41.11% of the selected scores. This was followed by the score option 6 with 28 (31.11%), 4 (somewhat true) with 14 (15.56%) occurrences, and 7 (very true) occurring 6 (6.67%) times. The scoring options with the least amount of occurrences were, in decreasing order, score 2 selected 4 (4.44%) times, score 3 selected 1 (1.11%) time, and score 1 (not true at all) with no selections. The majority of selected score options is positioned in the upper half of the table.

Table 9. The distribution and the SUM of answers to items for the construct Competence.

	Competence						
Items	Not true at all			Some-what true			Very true
	1	2	3	4	5	6	7
6.	0	1	4	5	5	7	1
11.	0	1	2	6	6	6	3
12.	0	1	3	10	10	3	1
14.	0	1	4	6	6	7	0
17.	0	0	1	10	10	5	1
SUM	0	4	1	14	37	28	6
%	0.00%	4.44%	1.11%	15.56%	41.11%	31.11%	6.67%

Table 10 represents the score distribution and SUM of responses to each of the items, with percentile (%) distribution for each domain of autonomy: Internal Perceived Locus of Causality (IPLOC), Volition (V), and Perceived Choice (PC). The most selected for all three items was the score of 6, selected 23 (42.59%) times for IPLOC, 21 (39.89%) times for volition, and 31 (43.06%) times for perceived choice. This was followed by a score of 5 for all dimensions of autonomy where, for IPLOC and volition, players selected the scoring option 13 (24.07%) times and for perceived choice 19 (26.39%) times. After this was the score of 7 (very true), which was selected 10 times for both IPLOC and perceived choice, representing 18.52% and 13.89% of the total score distribution. Volition was selected 9 (16.67%) times. The IPLOC score selection distribution continued with score 4 (somewhat true) selected 5 (9.26%) times, followed by score 2, selected 2 (3.70%) times, and 3 selected 1 (1.85%) time. Volition continued to decline in sequential score selection with score 3 being selected 6 (11.11%) times, score option 4 (somewhat true) selected 4 (7.41%) times, and score option 2 selected only 1(1.85%) time. Also perceived choice continued its decline in score selection with score 4 (somewhat true) selected 9 (12.50%) times, 3 selected 2 (2.78%) times, and 2 selected 1 (1.39%) time. In no dimension of autonomy was the score 1 (not true at all)

selected, representing a 0.00% distribution from all score selection options. The majority of the scoring options occurred in the higher range of the 7-point Likert scale, i.e., 5 through 7.

Table 10. Distribution and the SUM of answers to items for domains of Autonomy.

Autonomy--Internal perceived locus of causality							
Items	Not true at all			Some-what true			Very true
	1	2	3	4	5	6	7
2.	0	0	1	2	4	8	3
15.	0	1	0	2	5	6	4
16.	0	1	0	1	4	9	3
SUM	0	2	1	5	13	23	10
%	0.00%	3.70%	1.85%	9.26%	24.07%	42.59%	18.52%
Autonomy--Volition							
3.	0	0	3	1	6	5	3
5.	0	1	3	2	3	6	3
8.	0	0	0	1	4	10	3
SUM	0	1	6	4	13	21	9
%	0.00%	1.85%	11.11%	7.41%	24.07%	39.89%	16.67%
Autonomy – Perceived choice							
4.	0	0	0	3	3	8	4
9.	0	1	0	3	8	5	1
13.	0	0	1	2	4	10	1
20.	0	0	1	1	4	8	4
SUM	0	1	2	9	19	31	10
%	0.00%	1.39%	2.78%	12.50%	26.39%	43.06%	13.89%

7 Discussion

7.1 Potential benefits from participation in the framework

The first aim of this study was to identify the athlete-perceived usefulness of the implemented development framework with its future implementation potential as a season-long intervention and to investigate athlete-perceived impacts and benefits throughout the participation. It was hypothesized that players would recognize the IDF as a beneficial strategy with potential for future implementation, since statements linked to several constructs of athletic excellence elicited high impact.

As already noted, the core of the framework consists of a performance profiling strategy (Butler & Hardy 1992) in which perceived benefits were already identified (Wesont, Greenlees & Thelwell 2009). However the identified benefits were named on the basis of structured interviews, in which the questionnaire for identification of perceived benefits was designed and deployed after the profile had been implemented one time. Since this framework used the profile multiple times throughout the season in the modified version developed by the author, and uniquely implemented it multiple times throughout the process, the same characteristics were re-measured. In order to increase the value of the implemented framework, each impacted construct was further connected with relevant findings from the literature.

As emerged from the descriptive analysis of the questionnaire, the majority of players involved in the data collection identified the IDF (more than moderately) as a useful process for their development, with significant belief in its benefit for future participation. Furthermore, descriptive results on statements from the second and third sections of the questionnaire, as well as corresponding statements identifying the global impact IDF had on each of six measured constructs, further supported these findings.

The descriptive evidence from this research indicates that players perceived (more than moderately) the process as beneficial to their performance. On statements identifying metacognitive skill, their strongly perceived future benefits also supports the notion,

that participating in the same individual development structure in the future (performance analysis, progress monitoring, and recording of their improvements) would be beneficial. This would assist in further developing the self-reflection skill, bringing an athlete further onto the pathway to excellence.

In the theoretical rationale about the key sub-phases of the self-regulated learner (Zimmerman 1986.), which posits the importance of the self-regulated process in developing an athlete (Jonker et al. 2015), the literature has identified the metacognitive skill of self-evaluation as important. (Zimmerman 2002.) The extent team-sport athletes can realistically evaluate their own performance and self-reflect on their own development, has been identified as a determinant between good and poor developers and the athletes who reached or participated at the international or national level (Macnamara et al. 2012; Jonker et al. 2010, 2011).

While self-reflection and self-evaluation of one's own performance may be considered as one of the key mediators for athletes to attain high levels of competition and be identified as good developers, the literature has also stressed the quality of the coach-athlete relationship.

Indeed, various scholars have identified that developing an appropriate coach-athlete relationship is essential and beneficial in athletes' development process. It has been identified, however not limited, to have positive effects on individuals' collective efficacy (Hampson et al. 2014), in preventing dropout and burnout of young athletes from organized sports (Rottensteiner et al. 2015; Isoard-Gautheur et al. 2016), in enhancing athletes' wellbeing (Davis et al. 2014), and on athletes' desired physical performance (Jowett et al. 2007). However, in the predisposition to elicit the identified benefits, optimal interpersonal communication pathways inside the coach-athlete dyad need to be chosen and well formed (O'Malley et al. 2014).

As became apparent from the analysis of IDF's global impact on the construct coach-related performance, athletes perceived the process to be highly efficient. While the

name of the construct does not directly imply connection to the coach-athlete relationship dyad, the wording of the evaluated statements proves otherwise. Analysis of the responses to statements anchoring coach-related performance development shows that players perceived the development process as beneficial in aiding communication with their coach, in enhancing the coach's understanding of one-self (the athlete), and assisted the coach to use a more individualized approach in the training program development.

The recognized benefits of participation in the IDF are further supported with concrete findings and suggestions from the literature. For example, Kenow et al. (1999) found team-sport athletes identified that enriched interpersonal communication elicited high levels of compatibility with their coach. Furthermore, Jowet et al. (2005) found that achieving and maintaining harmony in coach-athlete dyads is a major challenge, where state-of-relationship harmony implies stability, fruitfulness, and efficiency in communicating with one another.

Multiple scholars have also identified the need for an individualized approach to athlete development because the adaptation process of multidimensional performance characteristics is nonlinear and results from various factors. As Bergeron et al. (2015) and Lloyd et al. (2012, 2014a) noted, the athlete's rate of adaptation is contingent on physical growth, biological maturation, and behavioural development, therefore making the individualized approach compatible with implementation into training development regimes. Radnor et al. (2016) and Lloyd et al. (2015) specifically investigated individual responses to different forms of resistance training, taking into account maturation, and concluded that individuals in post-PHV (peak height velocity) require more specific training stimulus to increase targeted areas for improvement. This again points to the urgency of integrating individualized approaches to athletes' development in team sports. Therefore, it is essential that sport practitioners working with young aspiring athletes recognize the unique requirements of athletes through athlete-centered practices and take into account, for each athlete separately, the relationship between biological maturation, cognitive development, and athletic performance (Lloyd et al. 2014b).

Results from current research also indicate the potential effects of IDF on the athlete's confidence level.

According to Nicholls et al. (2013), developing the optimal levels of an athlete's self-confidence enhances performance, helps athletes to effectively control emotions, increases effort in goal attainment and persistence in the sport, and helps to maintain psychological momentum. Hays et al. (2007) further delineated multiple dimensions of athlete confidence arising from 10 different sources, one related to coaching. World-class athletes have also identified the coach's advice, social support, appropriate training program and role as motivator as having a positive effect on their confidence.

Descriptive statistics on the evaluation of the benefits from the global theme confidence show that players highly perceived the structure of IDF as helping to build their confidence and optimally serve as a mediator for enhancement in their own ability.

For example, Sari et al. (2015) suggested in a quantitative study, that when athletes perceive they have high self-confidence and trust in their ability, their motivation for practice increases. This in turn produces higher levels of performance, as well as increasing intrinsic and extrinsic motivation. It should also be noted, that the structure of IDF requires athletes to subjectively evaluate their short-term (after each single game) and long-term (end of the cycle) performance on a regular basis.

While the process of subjective-performance evaluation can have positive effects on the athlete's confidence, practitioners need to also acknowledge possible detrimental effects. Indeed, Levey's et al. (2011) investigation of the confidence-performance relationship in a large sample indicated that confidence is positively and significantly associated with subjective performance evaluation, while Weston et al. (2011) suggested the need for caution due to the negative effects long-term implementation might have on confidence. This also should provide a word of caution during implementation of this framework, since athletes in the process were required to use self-regulation learning skills.

Results also indicate the beneficial effects of the framework on the athlete's motivation.

In the literature, motivation is identified as the direction of effort, whether an athlete intrinsically or extrinsically participates in a certain development opportunity and, as efforts intensify, identifying the level of effort the athlete puts into a particular situation, affecting the athlete's constant interaction with achievement of goals and perceptions of competence, self-worth and ability (Weinberg et al. 2015).

The Cognitive Evaluation Theory (CET) (Deci et al. 1984) proposed that controlling the nature of development, exposing young athletes to an environment which neglects their sense of autonomy and emphasizes extrinsic rewards, affects motivation negatively. Therefore the development program should aim to provide self-determined, competency-emphasized development opportunities which promote intrinsic motivation, taking the athlete's interests into account in the process of decision-making about development and goals. This will elicit higher levels of the athlete's self-determined intrinsic motivation, resulting in positive behavioural, cognitive, and affective outcomes (Weston et al. 2011).

This framework elicited a high level of motivation through one season's participation. This was due to implementing this framework, with its core the modified performance profiling strategy, and in accord with the autonomy-supportive nature of profiling (Butler et al. 1992) which had positive effects on athletes intrinsic motivation (Weston et al. 2011). The same effects cited by the literature on motivation were found in this case study, where the profile was used to improve the athlete's motivation, while participating in cognitive behavioural interventions. (Jones 1993.) Furthermore, it was found that profiling assisted athletes in the goal-setting process, after their weaknesses were identified and improved on.

Athlete's participating in this study perceived, above moderately, that the effects of the individual development framework on motivation were efficient. The nature of the development process allowed them the possibility to set goals for themselves, take more

control and responsibility of their own development and, at the same time, increase their motivation to train and improve themselves.

Throughout the literature, goal-setting has been identified as one of the major psychological skills in an athlete's success. Weinberg et al. (2000) reported, for example, that Olympic athletes used goal-setting to help enhance their performance. From this it can be postulated that goal-setting represents an important mechanisms for an athlete's success and optimal development. The same has been suggested by Guelmami et al. (2012). Investigation of the psychological profiles for talented male youth athletes in team-sport games indicated goal-setting as one of the psychological skills used to achieve the peak psychological state. Locket et al. (1985) identified this particular skill as also contributing to one's self-concept and increased self-efficacy. Locket et al. (2002) recently accumulated research papers about the effects of goal-setting and identified that the process does indeed stimulate performance improvement through setting up specific performance standards, indirectly increasing the effort an athlete places on personal development, develops athlete-planning skills, and maintains persistence during difficult times of the athlete's career.

Another beneficial aspect of the implemented framework indicated by this study is in the last two constructs, subjectively evaluated by athletes. According to athletes' perception, implemented strategy for individual development throughout the season raised self-awareness and increased their sport-based knowledge, which is in accordance with findings from Weston et al. (2011, 2013).

Results from the questionnaire indicate that athletes perceived the framework to be highly efficient in assisting them to highlight their strengths and weaknesses and helped them decide what they needed to work on in order to improve, therefore raising their self-awareness.

Beside the benefits of developing athletes' self-awareness, this case study also helped expand their sport-specific knowledge. Athletes rated the framework to be most effi-

cient in knowledge development by helping them highlight strategies about how to improve their weaknesses and develop an understanding of the requirements of their playing position. The potential benefits of these last two measured impacts relate directly to the athlete's increase in self-control and the quality of self-regulatory skills in approaching development.

As reviewed by Jonker et al. (2015), awareness and knowledge of an athlete about one's self, increases the capacity to optimally reflect on the current level of performance. Constant reflection on one's own process, with the addition of performance monitoring, enables comprehension and turns the obtained knowledge towards improvement of the developmental aspects for a better future performance.

7.1 Satisfaction of basic psychological needs throughout participation

The second part of the study investigated the extend players satisfied their own basic psychological needs throughout participation in IDF.

As identified in the literature review of this thesis, satisfying the athlete's needs for autonomy, competence and relatedness is the prerequisite for the development of intrinsically-produced behaviours of optimal engagement. Upon need satisfaction, needs will assume the role of fuel and allow one to function optimally and effectively, experience ongoing psychological growth, integrity, well-being and an increase in performance. Sport practitioners are therefore urged to design practices where each athlete is able to reach this innate prerequisite for optimal development.

In line with this hypothesis, results revealed that participation in this type of the framework throughout the season did, in general, elicit high levels of autonomy, competence, and optimal levels of relatedness for the majority of players.

The framework allowed athletes to be actively engaged in their self-determined development process, leading to high levels of autonomy. To identify the levels of satisfaction of the need for autonomy, analysis of its three sub-constructs was done.

Analysis of athlete responses indicates that the framework had a significant effect on their perceived inner locus of casualty. The high effect on it was elicited by the framework, which allowed them to pursue their own established goals and allowed for selection and development of self-determined constructs they believed to be important to further development of optimal performance. According to the results, athletes also felt an internal need to be part of this development, which further increased their perceived internal locus of casualty.

These results are in accordance with the literature, which shows that providing choice and acknowledgement of people's inner experience, is marked by a shift towards internal experience, prompting more internally perceived locus of causality (IPLOC). IPLOC is identified as a mechanical predisposition for intrinsic motivation and, subsequently, optimal performance (Deci & Ryna 2000, 234).

As further identified in the literature review, another sub-construct of autonomy can be fostered by the practitioner developing practices which allow an athlete to participate in development willingly – with volition. Throughout the season, athletes indicated that they highly perceived participation in the development opportunity willingly, by their own free will, and were not forced to do things they did not want to. It was the structure of the framework which allowed them to participate volitionally.

Further, they highly perceived the framework to significantly affect the third construct of autonomy, perceived choice. The high perceived choice levels attained were due to the framework integrating the athletes into the decision-making process concerning their own development. They were given opportunities to make choices and decisions, and had a say in how things were done.

However, in order for one to be fully intrinsically motivated, the need for competence and relatedness also needed to be satisfied.

For complete satisfaction of the need for competence, practices deployed by the practitioner need to allow individuals to develop feelings of being effective in various tasks

needed to be accomplished and established on the basis of self-identified performance weaknesses.

As identified by the review of the athlete-perceived scores on statements identifying the construct competence, participation in the implemented framework produced satisfaction of the need competence. The athletes highly perceived the framework as helping them become more skilled at playing ice hockey, overcoming challenges faced during the season, and developing the ability to perform well. In the process they were also given opportunities to feel good about their play.

The last important need to satisfy in developing practices to foster intrinsic motivation is the individual's need for relatedness. As reviewed, this need is represented with one's desire to be respected, connected, and cared for by others who are part of the person's social environment. This is achieved once one genuinely feels connected to others, has identified his position inside the group, and feels secure.

From the scores presented in the empirical part, it becomes evident that, in general, the levels of relatedness were optimally satisfied. As indicated through participation under the implemented development framework, the majority of the players adequately felt close to other people on the team and surrounded by caring people who could be trusted. Furthermore, to a certain degree, players showed concern for others on the team and formed close relationships with its members, developing a sense of belonging. However, it is important to mention, that the lower score obtained for this need should not allow the framework to be identified as inefficient. This is because the intrinsically-motivated behaviours that people engaged in mainly happened in isolation.

8 Conclusion: Origin of the framework and first-hand experiences

In conclusion, I would like to present my first-hand experiences as the main person responsible for implementing the framework in this study. But before that, there are some important facts which might help in better understanding my critique of the framework.

I am an aspiring coach beginning his coaching career. Despite having some knowledge of ice hockey obtained through my playing career and studies, there is a lot to learn. Due to time constraints and lack of staff resources, which every head coach battles, while coaching at the junior level of ice hockey in Finland I was forced to develop practice in accordance with the current athlete development guidelines, while simultaneously using the experience to invest into the team and my own learning process.

During the entire time the presented development process was implemented at the team level, I was its head coach, a position I was holding for the first time in my career. This demanded that I be completely in charge of both the individual's and the team's development process. The brainstorming process during the pre-season about what kind of development process needed to be created from the perspective of the team and athletes, led me to the framework described in this thesis.

A significant role in all this was played by the character of the team and the entire organization. At the time I integrated into the club's system, its culture was in transition from "hobby hockey" to "high-performance competitive" hockey. The transition started with the men's team moving up from the second highest level to the elite level of Finnish ice hockey. However, the coaches at the team's junior level had trained players through the previous years using "result oriented" development, neglecting the principles of the individual approach and autonomy support in deployed practices.

On the one hand, this represented an optimal time to expose my players to the proposed framework while, on the other hand, threw up challenges I needed to confront and engage in battle.

According to players, the previous coaches had not allowed the players to take any degree of self-initiative in their own development process. They were not asked to self-reflect on learning or their own performance. Before the coaches had told them what to do and how to do it, while not transferring the knowledge on how and why certain multidimensional performance characteristics needed to be developed and how those related to their performance. This indicated to me that implementation of the new development process would take longer than expected. It meant there was a necessity to introduce and elucidate some fundamental topics related to ice hockey in order to make implementation of the framework for players efficient, motivated and fully grasped.

Once the framework was implemented, everything ran smoothly at first due to the initial hype of a novel approach to their development. However, later in the season players start to disengage. We identified that the cause of this shift originated from the current coaching staff's behaviour and player habits that had developed over the years with the old system. It did not originate from a decrease in motivation.

The framework allowed players to choose what they wanted to improve, why and what will be gained. For me this was a learning experience. Eventually it led me to improve the framework's implementation process.

From the early days in the old team, the players had constantly been told what to do and how to do it. They were never offered a sense of freedom and were constantly monitored by the coaches to see if they were really executing the instructed program. According to the players this was the origin of their disengagement. Our coaching staff, on the other hand, was not regularly present and the shift to the new development program happened too fast. In our absence the players started to use their free

time to socialize instead of developing their skills. This major experience was important to our experience, as it might be for other coaches who adapt the principles or the framework as a whole. It served as a word of caution and was something we learned from.

If a sport organization wants to implement an athlete-first approach, my advice is to break the framework into smaller, easier units which can be gradually expanded, progressively introduced across multiple categories. The shift towards athlete-centered and self-determined development and learning takes time. In the integration of the new system, the culture of the clubs, the habits and coaching practices deployed, as well as the age categories, are all important and need to be taken into account.

An additional observation regards the interplay between the team's results, engagement in the program practices, and motivation. On the one hand, there was a reduction of players' motivation which occurred after consecutive losses of more than 4 games (in a timeframe of 2 weeks). On the other hand, as results from the empirical part indicate, players satisfied their basic psychological needs through participation in the program. And the literature identified this as fuel for further intrinsic motivation.

Compared to the empirical results from the thesis, observations indicate that unsuccessful results of the team's performance might shift the player from being motivated to amotivated for their development. But it could also indicate that coaching practices which rely solely on producing intrinsically motivated behaviours (at least for the age group coached and used as subjects for this research) might not be optimal for performance sports, or at least for high performance sports. However, this hypothesis needs further empirical research. Coaches experiencing similar problems through practices with characteristics of this framework should try to identify what drives extrinsic motivation and related behaviours. By knowing how to elicit both aspects of motivation (intrinsic and extrinsic), a coach may be able to shift the athlete's behaviour from amotivated to motivated, despite the team's result.

The deployed framework also had a positive effect on my own development as a coach. Through discussing the facilitative nature of the framework during the implementation of the performance profile, I was able to learn a lot from my players. Cyclical implementation allowed multiple times during the season for players to expand their own identities on the three aspects of performance profile. This often presented new challenges for me, since many times they described chosen constructs differently than I did and needed assistance in achieving them. Subsequently, I had to repeatedly refer back to the latest literature to provide the solutions and guide them towards attainment of the next level in performance. This developed of my own expertise and increased my knowledge base to be used in the future and regularly on a daily basis.

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Attachments

Attachment 1. Individual Development Process

1. Cycle – Individual player development form

Name:_____Start of the cycle:_____ End:_____

1. Technical/tactical aspect

Game situational roles (GSR)				
Situation:	**Offensive game**		**Defensive game**	
Role:	**Playing with the puck (GSR 1)**	**Playing without the puck (GSR 2)**	**Defending the player with the puck (GSR 3)**	**Deffending the player without the puck (GSR 4)**
Characteristic:				
Area of the field: Neutral zone Offensive zone Defensive zone				
Evaluationa (1-10): Player				
Evaluation (1-10) Coach				
End of cycle: Player (1-10)				
End of cycle: Coach (1-10)				
Average from internet				

2. SKATING- Physiological aspect (Select two capacities you would like to improve in upcoming cycle)

3. CHARACTER - Psychological aspect

Characteristic	Evaluation (1-10)	End of cycle evaluation (1-10)	Average score from after game evaluation

1. Cycle – Individual player development form

OFF ICE SPECIFIC MEASSUREMENTS		
Physiological capacities	Pre cycle result	Post cycle result
Maximum strength		
Explosive strength		
Muscular endurance		
Muscular endurance		
Cardiovascular endurance (aerobic and anaerobic capacity)		
Biomotro abilities		

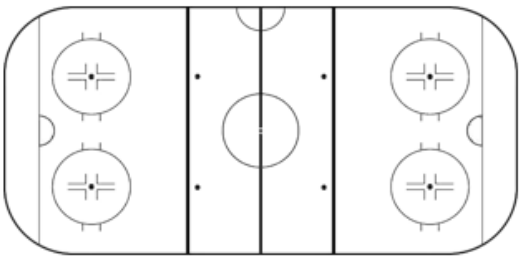
ON ICE SPECIFIC MEASSUREMENTS		
30m speed skating		
500m endurance skating		
Skating agility		
Stickhandling		

Attachment 2. Development of GAME identity

Name: _____ Date:_____ Cycle no._____

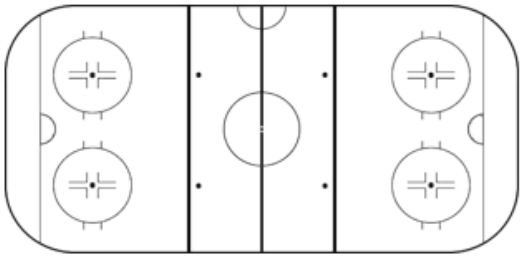
Game Situational role description:

1. Offending with the puck - (Offensive) :_____
2. Offending without the puck – Offensive):_____
3. Defending opponent with the puck – (Defensive):_____
4. Defending opponent without the puck – (Defensive):_____



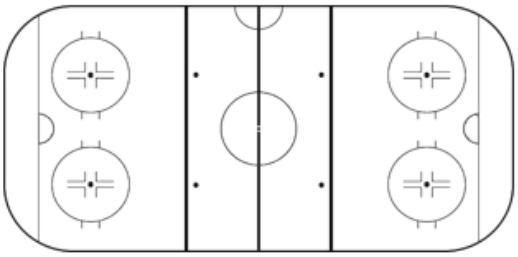
Role: 1 2 3 4	Time:	Reps:	Sets:
Procedure & crucial points:			

Reflection:



Role: 1 2 3 4	Time:	Reps:	Sets:
Procedure & crucial points:			

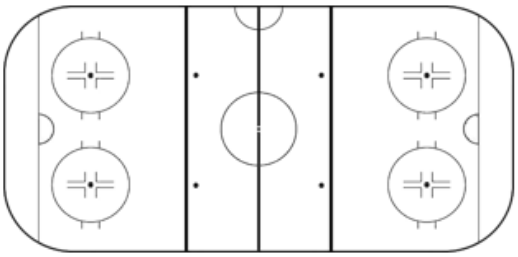
Reflection:



Role: 1 2 3 4 Time: Reps: Sets:

Procedure & crucial points:

Reflection:



Role: 1 2 3 4 Time: Reps: Sets:

Procedure & crucial points:

Reflection:

Analysis of cycle:

Attachment 3. Individual Development Process Evaluation Questionnaire

Name: Date:

1. Generally, how useful did you find the Individual development process and performance profiling strategy to be so far?

Not at al			Moderately			Very much
1	2	3	4	5	6	7

How much do you believe that you would benefit from participating in a similar/same individual development program in the future?

Not at al			Moderately			Very much
1	2	3	4	5	6	7

2. Please indicate, on the scale provided, the level of impact the "Individual development process" had on the following:

	Not at all			Moderately			Very Much
1.Helped to highlight my strengths	1	2	3	4	5	6	7
2.Helped to highlight my weaknesses	1	2	3	4	5	6	7
3.Helped to highlight the demands of my position	1	2	3	4	5	6	7
4.It helped to get something down on paper	1	2	3	4	5	6	7
5.It helped highlight strategies to improve	1	2	3	4	5	6	7
6.It help to enhance my confidence in my ability	1	2	3	4	5	6	7
7.It was a catalyst to help improve myself	1	2	3	4	5	6	7
8.It made me think about setting goals	1	2	3	4	5	6	7
9.Helped to highlight the demands of other positions	1	2	3	4	5	6	7

3. Please indicate on the scale provided the extent you would benefit from this type of individual development process in future:

	Not at all			Moderately			Very Much
1.To build my confidence	1	2	3	4	5	6	7
2.To help me decide what I need to work on	1	2	3	4	5	6	7
3.To monitor my progress	1	2	3	4	5	6	7
4.To aid communication with my coach	1	2	3	4	5	6	7
5.To set goals for myself	1	2	3	4	5	6	7
6.To take more control of my development	1	2	3	4	5	6	7
7.To motivate me to train	1	2	3	4	5	6	7
8.To motivate me to improve	1	2	3	4	5	6	7
9.To structure my training schedule	1	2	3	4	5	6	7
10.To help in the evaluation of my performance	1	2	3	4	5	6	7
11.To help the coach individualize my training	1	2	3	4	5	6	7
12.To improve the coach's understanding of me	1	2	3	4	5	6	7
13.To provide after game analysis	1	2	3	4	5	6	7
14.To record my improvements	1	2	3	4	5	6	7
15.To take more responsibility for my development	1	2	3	4	5	6	7

4. Please answer the statements according to your feelings and experiences when participating in INDIVIDUAL DEVELOPMENT PROCESS throughout the season of ice hockey (off-ice trainings, on-ice trainings, games, meetings, etc.).

Individual development process ...

	Not true at all					Somewhat true	Very true
Individual development process ...							
1. ... helped me to overcome challenges in ice hockey	1	2	3	4	5	6	7
2.... helped me to get more skilled at ice hockey.	1	2	3	4	5	6	7
3.... made me feel being good at ice hockey.	1	2	3	4	5	6	7
Throughout the individual development process...							
4.... I got opportunities to feel good at ice hockey	1	2	3	4	5	6	7
5.... I developed the ability to perform well in ice hockey	1	2	3	4	5	6	7
6.... I got opportunities to make choices	1	2	3	4	5	6	7
7.... I had a say in how things are done	1	2	3	4	5	6	7
8.... I could take part in the decision making process of my development.	1	2	3	4	5	6	7
9.... I got opportunities to make decisions.	1	2	3	4	5	6	7
10... I felt I am pursuing goals that are my own.ng	1	2	3	4	5	6	7
11... I have had a sense of wanting to be part of it.	1	2	3	4	5	6	7
12.... I felt that I am developing what I want to be developing	1	2	3	4	5	6	7
13... I felt close to other people in our team	1	2	3	4	5	6	7
14... I shown concern for others on our team	1	2	3	4	5	6	7
15... there were people in our team who cared about me.	1	2	3	4	5	6	7
16... There were people who I could trust	1	2	3	4	5	6	7
17... I had close relationships with people who were part of our team.	1	2	3	4	5	6	7
18... I felt forced to do things that I do not want	1	2	3	4	5	6	7
19. I felt I participated in Individual development process willingly	1	2	3	4	5	6	7
20. I chose to participate in Individual development process according to my own free will.	1	2	3	4	5	6	7