Haaga-Helia
University of Applied Sciences Ltd.

Creation of a content proposal for the IIHF Player Development Guide

Niklas Lundman

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Abstract

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Author(s)
Niklas Lundman

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The International Ice Hockey Federation (IIHF) is the international governing body of ice hockey and inline hockey. The IIHF has 76 member associations and each of these members is the governing body of the sport in its nation. The IIHF is devoted to the global development and promotion of these two sports by assisting its member associations.

The objectives of this research are, to provide reasoning for the IIHF for investing resources into the process of developing a long-term player development framework for its member National associations as well as to come up with a suggestion for the content of the framework. The research questions relate to the need and to the content of the framework. The name of the framework is: IIHF Player Development Guide.

This research consists of an examination process into the Long-Term Athlete Development Model, a quantitative research and a benchmarking process. The examination process into the Long-Term Athlete Development Model, provides knowledge on the process of long-term player development, which is important in the process of analysing the results of the quantitative research and the benchmarking process. The quantitative research and the benchmarking process provide answers on the research questions and research objectives.

The research resulted in providing a reasoning for the IIHF Player Development Guide and a suggestion for the content of the guide, both based on the results from the quantitative research and the benchmarking process. The results provide understanding on, why the global governing body of ice hockey should produce a long-term player development framework for its member National associations and what should be included in such a framework.

Keywords
Long-Term Player Development, Benchmarking, Quantitative Research, Ice Hockey, Sport Development

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1 Introduction

The International Ice Hockey Federation (IIHF) is the global governing body of ice hockey and inline hockey for both men and women. The IIHF has 76 member national associations, which are all acting as a governing body of the sport in their nation. The IIHF controls the international rulebook, is responsible for the international player transfers, dictates officiating guidelines, runs various programs, which are designed for making hockey familiar worldwide and organizes the IIHF World Championships at all levels. The IIHF is committed to govern, develop and promote hockey globally as well as to develop and control international ice and in-line hockey. The IIHF has given a promise of taking all necessary measures to support the member national associations in their processes of developing young players, coaches and game officials.

The research problem in this study is to be able to provide answers for the following two questions: why should the IIHF, as an international governing body of ice hockey, invest resources into the process of producing a long-term player development framework for its member national associations, and what should be included in the framework? The objectives of this research are to provide reasoning for the IIHF Player Development Guide (IIHF PDG) and to come up with a proposal for the content of the guide.

The purpose of providing a reasoning for the IIHF PDG is to insure the decision makers in the IIHF to see the importance of the guide and to make them invest resources into the project. The purpose of producing a suggestion for the content of the guide, is to provide the IIHF PDG Workgroup a concrete example for the table of content, which they can later utilize in the actual process of building the guide.

The literature part consists of the Long-Term Athlete Development Model (LTAD -model) and the benchmarking concept. The LTAD -model is included, because it provides vital information on understanding the basics of the human maturation and long-term athlete development, which are a necessity in the process of providing a proposal for the table of content of the IIHF PDG. The literature part of the benchmarking concept covers the different types of benchmarking, benchmarking process in general and benchmarking in sport management and development.

The research consists of an examination process into the Long-Term Athlete Development Model, a quantitative research and a benchmarking process. The examination process into the LTAD -model, provides the researcher knowledge on the facts of a long-term

player development, which is important in the process of analysing the results of the quantitative research and the benchmarking process. The quantitative research and the benchmarking process provide answers on the research questions and research objectives.

2 Benchmarking

Benchmarking as a term appeared in the management literature in the 1980s (Söderman & Dolles 2013, 61). Xerox corporation is seen as an initiator of the concept. The profitability curve of the Xerox corporation was pointing down before the organization started to compare its different parts to other companies. Comparison and the changes that Xerox made, based on the results that were found, led to a situation that Xerox became one of the most powerful corporations in the US. (Castonquay 2009, 31.)

The management literature specifies a great amount of different definitions for the concept of benchmarking. However, usually only the terminology that has been used and the amount of information included varies. In all its simplicity, benchmarking is a continuing, systematic process of comparing your own products, services and processes with other organizations. These other organizations are usually the biggest competitors, or market leaders on the chosen area of business. It is possible to compare an organization as a whole or just parts of it, such as processes, functions or products (Andersen & Pettersen (1996, 4). The main goal is to improve the performance of your own company by understanding the best possible methods and procedures. (Bramham 1997, 1; Söderman & Dolles 2013, 62; Tuominen 2017, 226.)

Products, services and processes are only rarely ideal, if they are directly copied from another organization, despite how great results or profits they are generating for the competitor. In the process of benchmarking, all the findings should be adapted to suit the prevalent circumstances and culture of one`s own organization. (Tuominen 2017, 236.)

2.1 Different types of benchmarking

As previously mentioned, management literature identifies a great amount of definitions for benchmarking as a concept. When it comes to the different types of benchmarking, the case is exactly the same (Armstrong, Brown & Smith 2013, 59).

One definition is, that the different types of benchmarking can be specified based on what and to whom something is being compared. It is possible to specify three types of benchmarking, when it comes to what is being compared: performance benchmarking, process benchmarking, and strategic benchmarking. Depending on whom organization is comparing against, four types can be specified: internal benchmarking, competitive benchmarking, functional benchmarking, and generic benchmarking. (Andersen & Pettersen 1996, 4-8.)

Tuominen (2017, 226) identifies that, when an organization is trying to improve its business idea, products, processes or know-how by using the concept of benchmarking, the four different types are: strategic benchmarking, product benchmarking, process benchmarking and know-how benchmarking. Whereas, Armstrong, Brown & Smith (2013, 59) identify the four different types as follows: internal, competitive, functional and generic.

Strategicmanagementinsight.com (2018) provides instead three different types for benchmarking, which are: strategic benchmarking, performance benchmarking and process benchmarking. For these three types of benchmarking they offer four ways to proceed the actual process of benchmarking. These four approaches are: internal benchmarking, external or competitive benchmarking, functional benchmarking, and generic benchmarking.

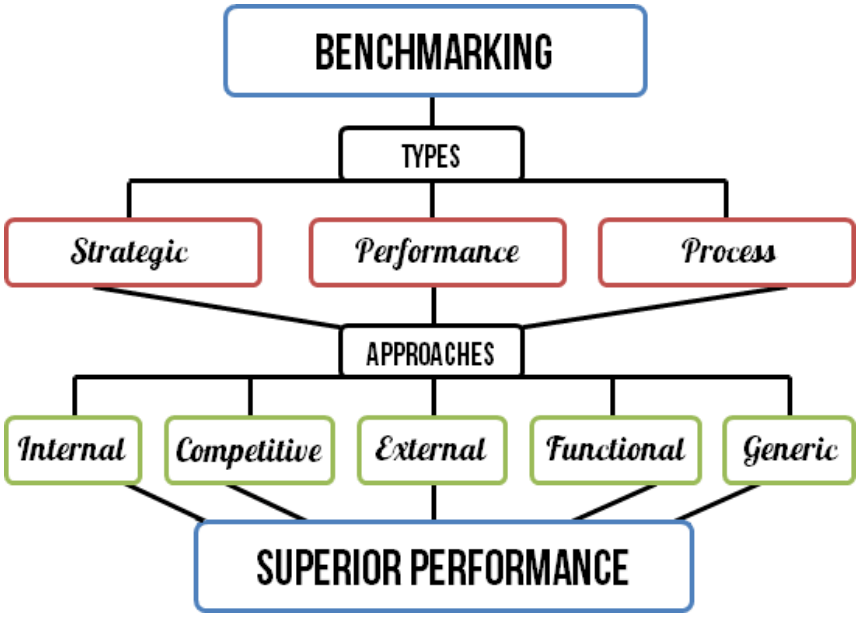

Figure 1. The types and approaches to benchmarking. (Strategicmanagementinsight.com 2018)

As proven, management literature provides a great amount of different variations, when it comes to the types of benchmarking. However, Armstrong, Brown & Smith (2013, 59) clarify that usually when a new approach shows up, it is nothing more than just a new name for already existing form of benchmarking.

2.2 Benchmarking process

As we may see in figure 2, a typical benchmarking process composes of five stages. These stages are: planning, analysis, integration, action and maturity. Each of these five stages include smaller steps, which give a body for any benchmarking process to be done. By following these 12 steps, one is able to build a successful benchmarking process. (O'Rourke 2012, 10.)

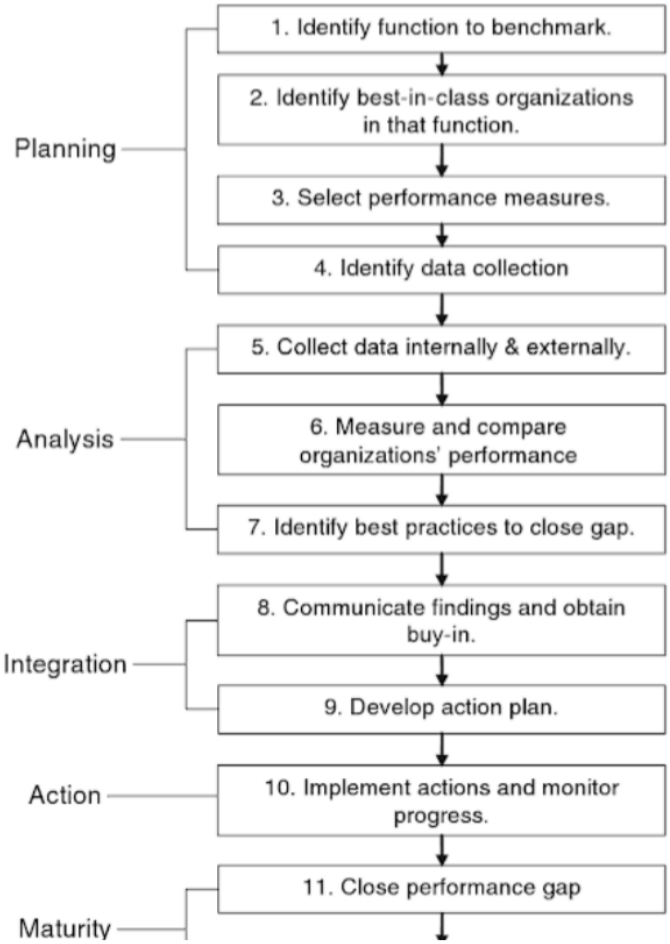

Figure 2. Typical benchmarking process (O'Rourke 2012, 11.)

Each benchmarking process is different and one to become successful, it must be well planned and organised. The whole process should always be started by defining what one wants to benchmark. The goal here is to be able to specify a target inside the organisation that needs to be improved. This target should have a major impact on the success of the organization. (StrategicManagementInsight.com 2018; Tuominen 2017, 243.)

The second step is to find an organization, or organisations, that are going to be benchmarked. The goal is that one is able to come up with the best possible examples, or at least able to find organisations in which the current situation is much better than in ones' own. (Tuominen 2017, 243.) Brainstorming is often used as a tool for gathering a list of potential benchmarking partner. At the beginning of the brainstorming, there are no wrong suggestions. However, during the session, a certain qualifying criteria must be set, for one to be able to cut the amount of candidates and at the end come up with one, or in some cases with multiple, partner. Examples of the qualifying criteria, are, for instance, national vs international organisation, culture, politics, ethics etc. The best possible benchmarking partner may be found internally (within own business), externally (other businesses) or globally (meaning best possible practice despite the business). During the process of searching benchmarking organisations, one should already start to specify the way the data is going to be gathered. (Godling 1995, 66-79; StrategicManagementInsight.com 2018)

After finding the organisation, which is going to be benchmarked, one has to measure and identify the differences in current performance between the own organisation and the other organisation. One should be interested in the current performance level, how rapidly it has increased, and what are the future expectations. (Tuominen 2017, 245.)

When the differences in current situation have been specified and measured, the next step is to recognize the key elements, that make the other organisation successful. These elements can be, for instance, processes or know-how, and there can be found one or multiple. (Tuominen 2017, 245.)

After these key elements have been found and one has a knowledge about how the other organisation is achieving good results, it is time to analyze ones' own organisation. One should confine, describe, measure, and understand his or her own similar processes. Only by knowing and understanding own processes, one is able to proceed comparisons and learn from the other organisation. After acquiring the knowledge about own organisation it is time to start focus on the organisation that is being benchmarked. The other organisation should now be analyzed through the same principles as ones' own. (Tuominen 2017, 246.)

The next step after analyzing both of the organisations, is to set goals for the process. Both short-term and long-term goals should be introduced. Setting these goals is an essential part of benchmarking process. However, understanding the key elements behind the performance, is even more crucial. One must also compose an implementation plan

and a timetable as well as ensure that the owner of the process is dedicated. One has to also control that the process will be concluded as planned and the goals are achieved. (Tuominen 2017, 247.)

Benchmarking is an ongoing process and it is crucial that after the set goals are achieved, new are determined. One should be eager to improve his or her own benchmarking process by benchmarking the best possible organisations. (Tuominen 2017, 248.)

2.3 Benchmarking in sport management and development

The concept of benchmarking has been widely used in the area of sport management and development. For instance, in different areas within elite sports, benchmarking has been used for studying and duplicating operating models of organizations and nations that have succeeded in a certain area within the sport globally. Benchmarking is seen as a good tool to be used, because it provides a method for gaining knowledge on what elite sport systems should comprise, and how those should be delivered. (Söderman & Dolles 2013, 61.)

Benchmarking is well-known of its ability to advance strategic designing, process analysis and evolution, as well as, organizational regeneration. For those reasons, it may offer a chance for managers of elite sport organisations to study and acquire, how to enhance the way of delivering their services and consequently improve probability of the consistent output of elite level athletes. However, there are also many obstacles to the utilization of benchmarking to enhance the elite sport systems. The common mistake is that one is trying to copy something directly form elsewhere without considering, for instance, the political and cultural environment, structural design and infrastructure. The role of benchmarking in elite sport systems should be seen as a learning process where organisations acquire knowledge and ideas about existing operating models. These models should be thoroughly analyzed and, if suitable, adapted. (Böhlke & Robinson 2009, 71 & 81-82.)

Benchmarking process in an elite sport system follows the same steps than in any area of business. Everything will start by defining the benchmarking objects, which in sport industry could be, for example, ones' coach education program. The next would be the selection of a benchmarking subject, which will be followed by data collection and analysis. Everything aims in to a deep understanding of the process. After the data is collected and analyzed, the comparison must be proceeded and improvement recommendations given. One of the most important parts in the process is to evaluate, if the identified practices are possible to transfer in ones' own organisation. (Böhlke & Robinson 2009, 72.)

As discussed above, commonly made mistake is to copy elite sport system development programs directly from other nations or organisations, without considering sectors such as political and cultural background, structural design and infrastructure. That is seen as a downside of benchmarking when it comes to use of the concept in sport management and development. However, when such areas are taken into a consideration, benchmarking has a potential to be an effective tool for developing different processes in elite sport systems and organisations. (Böhlke & Robinson 2009, 78.)

3 Long-Term Athlete Development

The objective of this chapter is to offer knowledge about The Long-Term Athlete Development Model (LTAD -model) and the Long-Term Player Development Model (LTPD -model). The LTAD -model and the LTPD -model are two different terms, but the meaning is completely the same. The only difference between these two is, that in some cases the researchers want to refer to an athlete (often when performing in an individual sport) and in other cases to a player (often when performing in a team ball sport). The LTAD -model and the LTPD -model is seen as the fundamental for the IIHF Player Development Guide.

When we are talking about the LTAD -model, we are talking about an environment where the short-term profits are not to be sought and the early success is not the targeted. We are acting in an environment, where all the actions are well planned, they are systematic and progressive. The ultimate goal is the life through development of the athlete. (Balyi, Way, Higgs 2013, 15.)

3.1 The Long-Term Athlete Development Model

The Long-Term Athlete Development Model (LTAD -model) was first introduced, because the quality of the sport and physical activity wanted to be improved. There was an understanding, that a fundamental change is vital, when developing the current structures in sports, at all levels. It was seen that in this change target must be set on the precise identification of principles and guidelines, which focus on the needs as well as goals of an individual, throughout his or her participation in sports. The aim of LTAD -model is to solve the many deficiencies and following consequences that disturb the present system and to offer positive experiences for participants at all levels. (Balyi, Way, Higgs 2013, 22.)

National governing bodies and different sporting associations, within various sports, around the world, have adopted the model and put it in to practise in their work for developing children and youth into elite athletes as well as in the process of defining training and coaching frameworks with the timing and tempo of maturation. (Ford & al. 2010, 390; Lloyd & al. 2014, 1442.)

The original LTAD -model consists of seven different stages that are designed to guide the involvement, practising, competing and recovery pathways in sport from early childhood to maturity. These different stages will be introduced in details later in this research. The seven stages of the LTAD -model are:

1. Active Start
2. FUNdamentals
3. Learn to Train
4. Train to Train
5. Train to Compete
6. Train to Win
7. Active for Life

(Balyi, Way, Higgs 2013, 26; Canadian Sport for Life 2014, 2.)

Some national sport associations in different sports have built their own LTAD or LTPD models that are composed from more stages than the original model of the LTAD, but are based on the original version. One example is the Hockey Canada's Long-Term Player Development (LTPD) model, which is an eight-stage model and is based on the physical, mental, emotional and cognitive development throughout the cycle of participation of an individual. In this specific model of the Hockey Canada the stages are as follows:

1. Discovery – Male and Female 0-4
2. Fundamentals 1 & 2 – Male and Female 5-6 – Male and Female 7-8
3. Learn to Play – Male 9-10, Female 8-9
4. Learn to Train – Male 11-12, Female 10-11
5. Train to Train – Male 12-16, Female 11-15
6. Train to Compete – Male 16-17, Female 16-18
7. Train to Win – Male 18-20, Female 18-22
8. Excel – Male 21+, Female 22+

(Hockey Canada 2013, 8-9.)

The LTAD -model sets a great focus on the needs of an individual and his or her current stage of development. The model may be seen as a physiological perspective, which provides knowledge on athlete development, hand in hand with biological growth. The LTAD model strives to optimize success in long-term, and is strongly based on the accelerated periods of learning. (Ford & al. 2010, 389.) It is vital for the ones that are participating in the development process of an athlete to understand and remember, that moving from one stage to another must always be based on the skills and capability of the individual and not chronological age. In the LTAD -model the different sectors of athlete's life should also work in co-operation. It means that, for instance, sport, physical activity, education, family life and health must be supervised and linked together. By doing that, it is considerably easier to control, for example, the workloads from the different fields of one's life and that way optimize the development of an individual. The model is developed for both participation and competitive sports. The athletes who have decided to join the performance-oriented path, experience developmentally suitable programs in both competition and training throughout their participation cycle in sports. The ultimate goal there is to boost their participation and optimize their performance. For the ones who have joined more

participation-oriented path, the model offers fundamental sport skills and abilities to keep up the lifelong participation in sports. (Balyi, Way, Higgs 2013, 16, 27 & 29; Canadian Sport for Life 2014, 15.)

The LTAD model was created with the great focus on the improvement of fundamental sport abilities and sport-specific skills. Vision of the LTAD -model is to build pathways for young talents to develop within competitive sport. The model always sets a great emphasis on an individual's personal goals, needs, and the current stage of athletic development. The three key outcomes that the LTAD -model has to offer are visualized in the Figure 3.

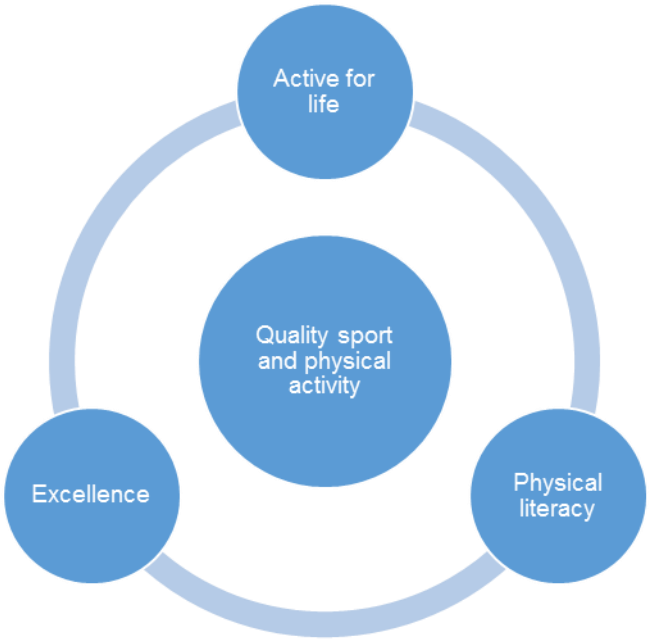

Figure 3. Three outcomes of LTAD (Balyi, Way, Higgs 2013, 33.)

3.2 Long-Term Athlete Development Model Key Factors

The LTAD –model states, that when any coach, club or sport organization is willing to execute its actions through the principles of the model, the ten key factors of the model must be taken into account. The model is strongly based on these key factors and has also received direct criticism because of them. It has been said that the model is strongly based on experiential perceptions and it would need more scientific eligibility (Ford & al. 2010, 390; Lloyd & al. 2014, 1443). However, in this chapter the ten key factors are going to be presented.

3.2.1 Physical literacy

First, out of the ten LTAD -model key factors, is the physical literacy. Physical literacy has a plenty of definitions, but in all simplicity it is the mastering of fundamental movement

skills and foundational human movements as well as sport skills. It is the improvement and the ability in fundamental movement skills and fundamental sport skills, that provide children confidence in a various physically challenging situations, because one is able to move with economy and self-assurance (Ford & al. 2010, 392). It also guarantees that individuals have the opportunity to participate in a wide variety of activities during a lifetime, and increases their potential for future success. Physical literacy prevents children from pulling out from physical activities and sports and supports children to make more physically active and healthier choices in future. (Balyi, Way, Higgs 2013, 26 & 62-72; USA Hockey, 2018; Canadian Sport for Life 2014, 23; Ultimate Canada 2016, 21; Canadian Basketball 2008, 8.)

Physical literacy consists of skills that should be improved prior the growth spurt, that will occur during the puberty. These skills are a fusion of basic human movements, foundational human movement and sport skills. Such skills are vital for both health-focused physical activity and professional sports. The development process of fundamental movement skills begins when the child is born and continues until one reaches the age of 11-12 It has been widely proposed by scientists that the different fundamental movements have a multiple developmental stages (Ford & al. 2010, 392). Foundational human movement skills are, for example, catching, jumping, running, swimming, throwing and pushing. To be able to master physical activity, one has to learn fundamental movement and sport skills in four different environments: on the ground, in the water, on snow and ice and in the air. One key thing to understand is, that if an individual does not learn those fundamental human movement skills during childhood, it will limit future sport and fitness opportunities considerably (see Figure 4). (Balyi, Way, Higgs 2013, 26 & 62-73; USA Hockey, 2018; Canadian Sport for Life 2014, 24-25; Ultimate Canada 2016, 21.)

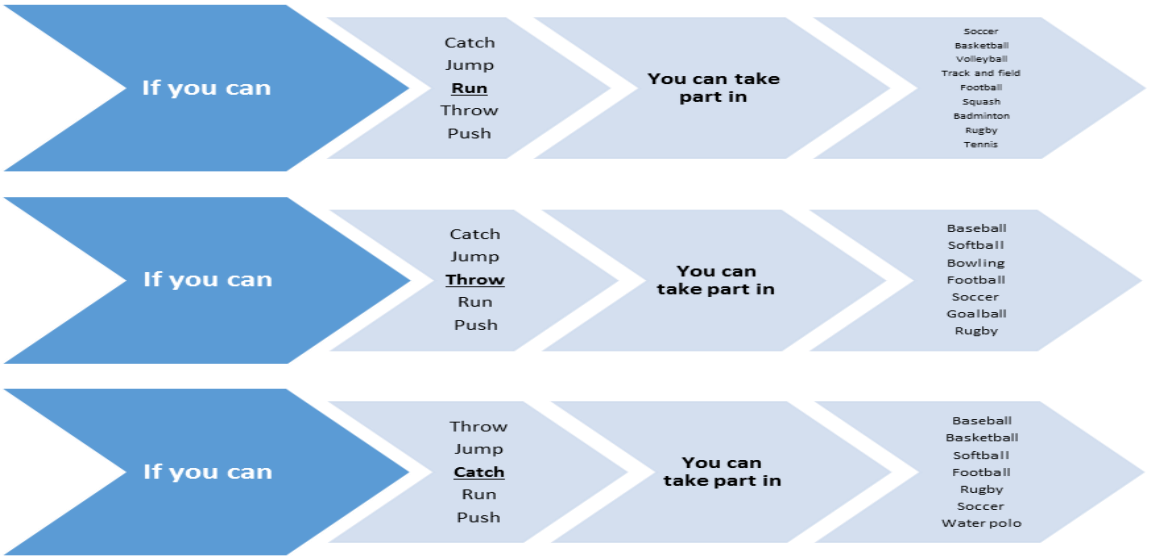

Figure 4. The benefits of having physical literacy in fundamental skills. (Balyi, Way, Higgs 2013, 74.)

3.2.2 Specialization

Specialization is the second of the key factors in the LTAD -model. Specialization means that athlete limits his or her participation to one sport, or specialization within the sport. Athlete concentrates year-round only in one sport, without competing in or even training others, or within the sport plays, for example, only one position. Different sports are divided into two: early and late specialization sports. Early specialization sports may be divided further in two different categories: acrobatic and highly kinesthetic, whereas late specialization into four: early engagement (kinesthetic, team and visual), common, late and very late or transfer. (Balyi, Way, Higgs 2013, 62 & 92; USA Hockey, 2018; Canadian Sport for Life 2014, 26; Ultimate Canada 2016, 25; Canadian Basketball 2008, 10.)

Sports such as figure skating, gymnastics and diving are seen as an early specialization (acrobatic) sports. Those sports are highly acrobatic, techniques must be highly precise, decision making process is relatively simple and they are based on routines. Sports like equestrian, snowboarding, synchronized swimming and swimming are also early specialization sports, but are representing the kinesthetic half. They are highly kinesthetic, they insist also a very precise technique, decision making process is simple, based on routine, they are highly acrobatic, in these sports there is often a need for strength to lift and rotate equipment. (Balyi, Way, Higgs 2013, 93; USA Hockey, 2018; Ultimate Canada 2016, 25.)

Sports such as alpine skiing, freestyle skiing and cross-country skiing are also kinesthetic, but seen as late specialization sports. Even though these sports are late specialization sports an athlete must to acquire a great level of feel for the surface, snow. That means that the early engagement with snow sports is required. Sports in this category are highly kinesthetic and athlete must be very familiar with snow or ice, they are athletic and acrobatic, like in early specialization sports high sport precise technique must be performed and the decision making is simple. These sports are performed with equipment that must be lifted and moved. (Balyi, Way, Higgs 2013, 93; Canadian Sport for Life 2014, 26.)

Basketball, soccer and ice hockey are great examples of late specialization, early engagement, team sports. In these sports is vital that athlete has improved a high level of feel for the ball or the stick with the puck already in the childhood. In these sports, however, fundamental movement skills and universal athletic ability are so vital, that early specialization has a negative influence on athlete. These sports do not contain routines and for that

reason decision making is complex, athletes performing these sports must have multiple skills, sports in this category are kinesthetic, because a feel for the instrument in required, technique is important, but does not have to be precise and these sports are seen very athletic instead of acrobatic. In these team sports athletes are not capable to reach their full potential before the end of the growth maturity. (Balyi, Way, Higgs 2013, 93; USA Hockey, 2018; Canadian Sport for Life 2014, 26.)

Badminton, fencing, squash and tennis are representing the late specialization, early engagement, visual –category. In these sports the need for visual tracking of an object is high and means that early familiarization in these sports is required, but again early specialization may have negative impact. In such sports visual tracking is crucial, decision making is based on the opponent and routines are not possible. These sports are kinesthetic, because the feel for the instrument is vital, technique is again important, but does not have to be precise. Sports in this category are seen more athletic than acrobatic. (Balyi, Way, Higgs 2013, 93-94; Canadian Sport for Life 2014, 26.)

Common late specialization sports are, for example, athletics, baseball, biathlon, bowling, boxing, curling, karate, orienteering, speed skating etc. In these sports visual tracking is vital, these sports require a basic decision making and tactics. In such sports kinesthetics and technique are crucial, but again technique must not be precise. These sports are again, like other late specialization sports, more athletic than acrobatic. (Balyi, Way, Higgs 2013, 94.)

Very late or transfer sports may be such as cycling, golf, rowing, triathlon, volleyball or waterskiing. These are all late specialization sports and the athlete must possess high power to be successful. These sports are very late specialization sports, which means that athletes may transfer from other sports and achieve success in their new sport. In these sports the decision making and tactics are basic. Technique is again important, but must not be precise. Sports in this category require a high kinesthetics and a great volume of practising before entering the train to compete stage. (Balyi, Way, Higgs 2013, 94; Canadian Sport for Life 2014, 26.)

In early specialization sports, which exists considerably less, sport specific training should be started by ages 5 to 7, whereas in late specialization sports specialization may be started as late as between the ages of 12 and 15. In both is vital that athletes have obtained physical literacy before entering the puberty and growth spurt. (Balyi, Way, Higgs 2013, 62 & 92.)

When athletes are focusing on one sport only, they are able to improve the sport specific skills, coordination and fitness necessary for success in that sport, but often the success may be achieved only in short term. Focusing early in one sport limits or even hinders the development of other vital fundamental sport skills. These skills are crucial, if athletes are willing to take part in a variety of sporting and social situations. It is widely recognized that it is advantageous for young athletes to take part in a great number of sports and work with a number of coaches. The early specialization in one sport may also lead to some sport specific overuse and chronic injuries, such as tennis elbow, rotator cuff injuries, stress fractures etc. When young athletes are specialized to one sport already at a relatively early age, there is the risk that they are going to put too much of their selves into it and feel heartbroken if they fail. Sometimes these young athletes become too success oriented and because of the continuous training, they may forget the other essential parts of their lives, such as social skills and connections. By specializing early into one sport, a young athlete has a risk to physiological burnout. (Balyi, Way, Higgs 2013, 90-91; Canadian Sport for Life 2014, 26; Ultimate Canada 2016, 25; Canadian Basketball 2008, 10.)

Children who participate or try a number of sports and make the decision of specialization at older ages are able to achieve higher performance levels that the ones who decide to specialize early. Such individuals have a lower possibility to burn out and also the chance to develop the perfectionist attitudes that many times evolves with early specialization is decreased. Athletes that have tried a number of sport in their early years, develop better movement patterns and decision-making skills, because they have faced a great number of different kind of situations in different sports. It is also often recognized that these athletes are mentally fresh and open-minded for new situations. If athletes have been involved in multiple sports during their youth, they have an advantage when it comes to selecting their sport. They are able to select a sport that suits their mental makeup and physique and if they decide to specialize, they will be familiar with the sport they will excel. (Balyi, Way, Higgs 2013, 91.)

3.2.3 Age

Age of an athlete must always be considered. In the LTAD –model it cannot be done just by looking the date of birth. Superiors must always, know the chronological age of their athletes (the exact age), but also simultaneously observe the relative age (the disparities in age among children with the same year of birth), developmental age (physical, mental, cognitive, and emotional maturity), skeletal age (the maturity of the skeleton), general training age (the number of participation years in sports) and sport-specific training age of

athletes (the number of years since the athlete decided to specialize in one sport). (Balyi, Way, Higgs 2013, 62-63; Hockey Canada 2013, 19; USA Hockey, 2018; Canadian Sport for Life 2014, 29.)

In youth sports a child born January 1 will take part in same programs and competitions as a child born on December 31 at the same year. In practice it means that there can be a situation, where one athlete is basically one year older than another. In most cases children who are the oldest in their team or training group tend to be bigger, have more power and better skills than their teammates who are born later during the same year. That may lead into a situation, where coaches invest more resources and give more playing time for these "older" players, because they may see them overall better players or athletes as they see their younger teammates. In the real world it means that individuals may often be unfairly rejected in the selection process because of their month of birth. (Balyi, Way, Higgs 2013, 106-110; USA Hockey, 2018; Canadian Sport for Life 2014, 29; Canadian Basketball 2008, 12.)

Developmental age is a big factor when it comes to selection of athletes. There is a possibility that the developmental age between two young athletes can reveal a multiple year spread of maturation differences. For that reason, it is vital for coaches to understand the maturation process. Both early and late maturers face some concerns during their maturation process. (Balyi, Way, Higgs 2013, 112; Hockey Canada 2013, 19-21; USA Hockey, 2018 Ultimate Canada 2016, 25.)

Early maturers tend to rely on their advantage which they achieve from their advanced developmental age. They are bigger and stronger than the others. It may lead to a problem in which athletes do not develop their skills or fitness, because they lean on their early physical development. In some point these athletes are going to lose their physical advantage, because the late maturers will catch them, and if they are also lacking the skills needed in their sports, it may easily lead to frustration and drop out around the age of 14 and 15. (Balyi, Way, Higgs 2013, 113; Canadian Sport for Life 2014, 30.)

Late maturers are often seen as less skilled in sports, because they often tend to lack in physical presence. It may again lead in to a situation where they receive lower-quality programming and coaching. If that happens it will have a great influence on their possibilities to fully develop their skills. When late maturers do remain in sport and are provided quality coaching, they have a greater chance to fulfill their potential and become better athletes than early maturers. (Balyi, Way, Higgs 2013, 114; Hockey Canada 2013, 19; USA

Hockey, 2018; Canadian Sport for Life 2014, 29; Ultimate Canada 2016, 25; Canadian Basketball 2008, 12.)

Training programs, during puberty, should be based on the individual states of growth of athletes. Because of that, height of athletes should be regularly measured. By doing so coach is able to diagnose the start of the growth spurt and the peak height velocity (PHV) curve for his or her athletes. The highest point of the curve is the peak height velocity and the radical rise in the curve just before the PHV is the growth spurt (See Figure 5.) (Balyi, Way, Higgs 2013, 115; Canadian Sport for Life 2014, 29.)

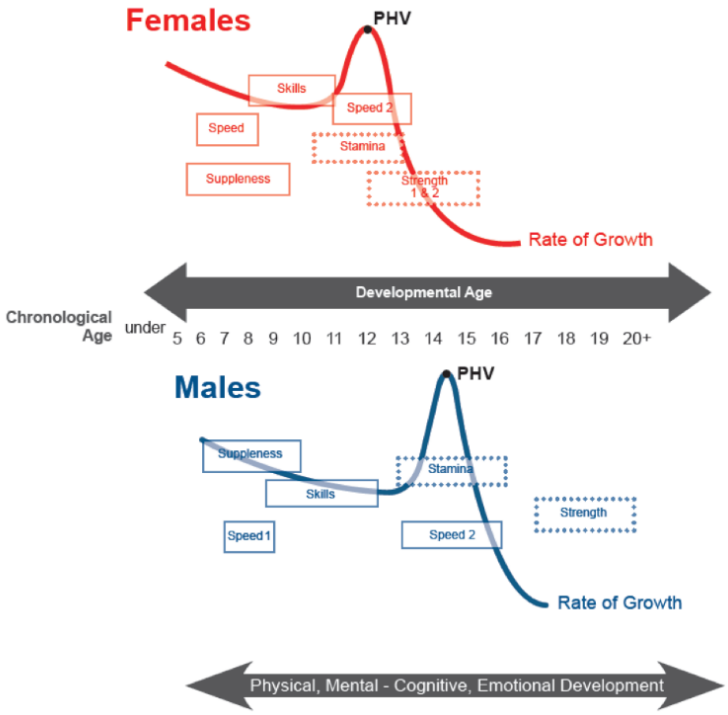

Figure 5. Peak height velocity curve. (USA Hockey 2017.)

On average, PHV occurs in girls around at 12 years of age and in boys around 14 years of age. However, in both genders it is completely normal, if start of PHV takes place two or more years earlier or later than on average. PHV tends to be more intensive in boys. First physical sign in girls is breast budding, which occurs soon after the start of the growth spurt. After that the pubic hair starts to grow. In boys, growth of the testes, pubic hair and penis are signs of the improvements in the maturation process. (Balyi, Way, Higgs 2013, 116; Canadian Sport for Life 2014, 30.)

3.2.4 Trainability

During the maturity process athletes go through different sensitive periods in which training for different abilities is accelerated. To be able to optimize training and competition

programs, coaches must be aware of these sensitive periods. If training and competition are well planned and the periods of accelerated learning are known and recognised, training of abilities such as stamina, strength, speed, skill and flexibility can be optimal executed. There are also great differences in trainability between athletes. Factors such as genetics, developmental age, and diet all have an impact on the trainability of an individual. (Balyi, Way, Higgs 2013, 63; Hockey Canada 2013, 20; USA Hockey, 2018; Ultimate Canada 2016, 26-27.)

Windows of accelerated adaptation for different features, such as stamina, strength, speed, skill and suppleness, are described in figure 6. As we may see, the different time frames for different genders are easy to notice.

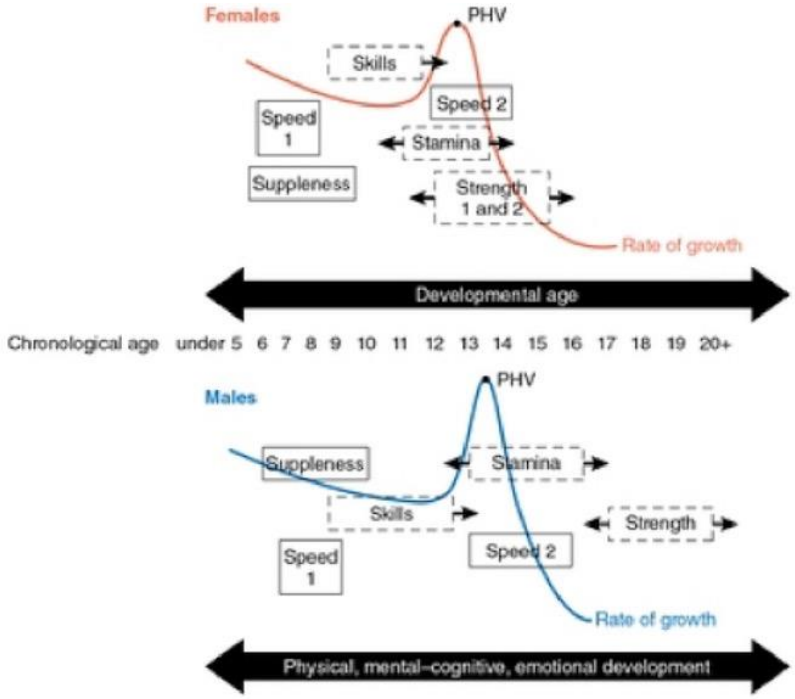

Figure 6. Windows of accelerated adaptation to training. (Balyi, Way, Higgs 2013, 145.)

As the Figure 6 presents, development processes of athletes should be started with speed, suppleness and skill training. The first window for speed training is focused on training the central nervous system, which does control, for example, agility, quickness, and change of direction qualities. This window takes place between the ages of 6 to 8 for girls and 7 to 9 for boys. The volume in training should be held very low, whereas the intensity may be high and exercises should not last longer than five seconds. Systematic training of anaerobic qualities should be started only during the second window of accelerated speed training between the ages of 11 to 13 for girls and 13 to 16 for boys. (Balyi, Way, Higgs 2013, 152; Hockey Canada 2013, 22; USA Hockey, 2018; Canadian Sport for Life 2014, 31-33; Ultimate Canada 2016, 26-27; Canadian Basketball 2008, 20.)

The window of accelerated adaptation for fundamental movement skills and sport skills is between the ages of 5 and 12. When children are physically active their coordination and motor skills develop very well, as does their nervous system. Fundamental sport skills that children should acquire during these seven years are, for instance, agility, balance, coordination, speed, jumping, climbing, walking, skating, hopping, swimming, skipping, throwing, dribbling, kicking, hitting and catching. Coordinative maturity takes place before sexual maturation and is the key reason for early specialization sports to start sport-specific training at 5 to 6 years of age. In these sports the need for acquiring sport-specific and general skills before start of the growth spurt is vital. In all sports, early and late specialization, fundamental movement and basic sport-specific skills need to be developed before the ages 11 and 12, for both genders. Skills should be trained throughout the life cycle, but trainability declines step by step after 11 to 12 years of age. (Balyi, Way, Higgs 2013, 153-159; Hockey Canada 2013, 22; USA Hockey, 2018; Ultimate Canada 2016, 28; Canadian Basketball 2008, 20.)

Suppleness, or flexibility, is a very important training and performance factor and training should be begun at an early training age, already at the age of 6. The period before the puberty, normally from age 9 to 12, is a sensitive period for flexibility training. During this phase optimal levels of flexibility may be obtained. Dynamic mobility and static stretching should be trained before the start of the growth spurt. During growth spurt, a great attention should be paid to flexibility levels. (Balyi, Way, Higgs 2013, 159; Hockey Canada 2013, 22; USA Hockey, 2018; Canadian Sport for Life 2014, 33; Ultimate Canada 2016, 28.)

When athletes reach the onset of the growth spurt, their bodies are capable for aerobic endurance training and window for accelerated adaptation is on. Aerobic base of athletes can be developed, for example, by slow distance aerobic intervals. Aerobic power training should be first started when the pace of growth slows down. Aerobic capacity and power helps athletes to train for longer periods of time, recover between sets or training sessions and general. These two qualities help significantly with recovery from smaller injuries. Always when possible programs for aerobic training for girls between 11 and 15 and boys between 12 and 16 should be planned individually. State of maturity of athletes should be considered and athletes should be divided into groups based on that. (Balyi, Way, Higgs 2013, 145-148; Hockey Canada 2013, 22; USA Hockey, 2018; Canadian Sport for Life 2014, 33; Ultimate Canada 2016, 28; Canadian Basketball 2008, 20.)

Strength training can, and should, be started at an early training age by using own body as a weight. Exercises such as push-ups and chin-ups or various movements with medicine balls, and Swiss balls develop basic movement skills and general strength and power. Good sport-specific flexibility is vital for safe strength training. Gains in strength before puberty are explained by motor learning, development in motor coordination, and neurological adaptations. The window of accelerated adaptation for strength training takes place toward the end of, and immediately after, peak height velocity for girls, and for boys 12 to 18 months after PHV. Optimal for strength training is when athletes have learned correct weightlifting techniques during the window of accelerated trainability for skills, which occurs before the growth spurt. (Balyi, Way, Higgs 2013, 149-151; Hockey Canada 2013, 22; USA Hockey, 2018; Canadian Sport for Life 2014, 33; Ultimate Canada 2016, 28; Canadian Basketball 2008, 20.)

3.2.5 Intellectual, Emotional, and Moral Development

Strong emotions have a big role in different parts of life, also sports. For a coach is vital to understand, that athletes develop emotionally and intellectual individually. When athletes are at different rates of emotional and intellectual development, they will also experience negative and positive emotions differently. Coaches have to be aware of this and understand that it will have an effect on training and competition. (Balyi, Way, Higgs 2013, 63.)

The different stages in physical development of an individual are relatively easy to recognize. Athletes become bigger and stronger, and their features change as they develop sexually. Hard part is to recognize intellectual (how an individual process information), emotional and moral (what is right and what wrong) development of athletes. One of the biggest challenges is that the age at which individuals move intellectually, emotionally and morally from stage to another varies greatly. In individual sports it is already a very challenging task to keep on track of were the individual is going concerning the development process, but in team sports it is exceptionally challenging. Vital aspect for coaches to understand and remember is, that the physical development is not a good indicator of intellectual, emotional, or moral maturity. (Balyi, Way, Higgs 2013, 172-174)

A vital part of making sure that coaching is consistent and the physical, intellectual, emotional, and moral stages are recognized is to understand differences in learning styles. Learning styles are divided into three major categories which are visual learners, auditory learners, and kinesthetic learners. Visual learners learn by seeing demonstrations, videos, and like to observe coach's face and body. These learners tend to think in pictures and have problems doing things they are not able to visualize. They don't like to hear that

much explanations. They just want to see it done and then try it. Auditory learners instead, learn by listening and may even prefer not to observe coach. These learners need verbal instructions and like to ask questions. Kinesthetic learners must have a chance to move, do and touch. They need to have their bodies physically active and they learn by doing. In real life, most children learn best through two or three different learning styles. (Balyi, Way, Higgs 2013, 182-183.)

As mentioned above, individuals develop physically, intellectually, emotionally and, morally at varying speeds. Coaches who are engaged to LTAD should be able to recognize the current stages of their athletes on these areas. (Balyi, Way, Higgs 2013, 183.)

3.2.6 Excellence takes time

It is very important for athletes, parents and coaches to understand that excellence takes time. It does not matter how gifted or talented athlete is, if he or she is willing to become best in sport, it will require years of training and competing. During those years of training and competing, progression in both training of different aspects and performing must be present. Whole pathway from childhood to adulthood must be well planned and executed to ensure optimal improvement. (Balyi, Way, Higgs 2013, 63; Canadian Sport for Life 2014, 42.)

There has always been much discussion about how much time is needed to develop excellence in sports. Usually the amount that comes up is 10,000 hours, or 10 years, of quality training. However, lately the 10,000-hour or 10 years rule has been widely criticized by several researchers. They are saying that the study, on what the suggestion of 10,000-hours or 10 years is based on, was done with the musicians and not with athletes. Same researchers are determining, that the focus should not be set only on obtaining those hours or years in any given activity. It has been stated, that the 10,000-hours rule should not anymore be used as a guideline for long-term athlete development programs. The rule of 10,000-hours or 10 years is not supporting the idea of building individualized programs for athletes, which is seen as a major factor in the process of long-term athlete development. (Lloyd & al. 2014, 1443.)

One major factor, among the training and competing hours, is the level of coaching during those hours and years of training. Everything must not be structured and well planned. Individual practice and free play are also seen very beneficial to developing expertise, as are also hours and days spent in other sports. The LTAD –model gives a great recommendation for free play (unstructured) and participation in other sports. Participation in

multiple sports during the early stages of the LTAD –model appears to support elite athletes to improve skills that serve them in long term. Participating in a number of sports develops capacities that are needed in all sports, for example, power, endurance, muscle, game sense, mental toughness, agility, balance, and coordination. Free play is managed by children themselves, which means that, for example, rules and teams are negotiated independently without support from adults. By doing so, children will improve their creativity and decision making skills. Those hours that children are spending playing free are counted toward the thousands of hours of training that they need to become elite. (Balyi, Way, Higgs 2013, 190-192; USA Hockey 2018; Canadian Sport for Life 2014, 42; Ultimate Canada 2016, 22; Canadian Basketball 2008, 18.)

Excellence takes time and it means that athletes, coaches and parents must have practice patience. The focus on winning should be reduced, because it focuses mainly on the short-term and does not support long-term aspects. Children must also be encouraged to take part in unstructured free play with friends daily on their free time and in school. They should also be motivated to participate multiple sports during their early years, and sport should be kept fun. (Balyi, Way, Higgs 2013, 197-198; USA Hockey 2018.)

3.2.7 Periodization

For an athlete to become successful in sport, periodization is one of the key factors. For optimal development right things must be done at the right time and in right order. Periodization is planning and segmenting the year into timespans for preparation, competition, rest, and recovery. Coach must again be aware of periodization and possess the knowhow in this area of coaching. Coach must be able to organize training components into weeks, days and individual training sessions. It is important also that coach is able to make progression and programs for aspects such as volume and intensity. Progression and programs should be planned long-term and short-term, because only by doing so we are able to secure the optimal development of an athlete. (Balyi, Way, Higgs 2013, 63-64; USA Hockey 2018; Canadian Sport for Life 2014, 38; Ultimate Canada 2016, 28.)

Periodization is time management. It includes, as mentioned above, planning for training, competitions, rest, and recovery. For optimal development of an athlete, plans should be made long-term (multiyear) and short-term (annual). Aspects such as volume, intensity and frequency of training should be covered in these plans. Periodization as a planning technique offers a great way to arrange the different components of training processes, such as skill training, condition training and regeneration. These components are divided into weeks, days, and individual training sessions. Periodization is very flexible tool and

when used appropriately it is an crucial instrument in athlete development. (Balyi, Way, Higgs 2013, 203-207; USA Hockey 2018; Canadian Sport for Life 2014, 38; Ultimate Canada 2016, 28; Canadian Basketball 2008, 16.)

3.2.8 Competition

Competition is a big and essential part of sports, but far too often success of an athlete or coach is determined by the outcome of competitions. However, developmentally planned and implemented competition, which is also stage appropriate for athletes has a great role in the LTAD –model. (Balyi, Way, Higgs 2013, 64.)

In big picture the whole way of competitions should be reconsidered. Young athletes do not need the same kind of competition structure as does high-performance adults. Children may face negative experiences, which may lead to negative influence on them, when they are exposed to high-pressure competition or performance situations before they have had time and repetitions to improve their technical and mental skills and abilities. Children and youth sport should never be all about winning. They are able to build up the competition by themselves and do not need a scoreboard etc. Main goals should always be the development of an athlete, and positive experiences. Competition should not be totally removed from the children's sport, but structures should not be copied from the professional adults. (Balyi, Way, Higgs 2013, 257.)

The LTAD –model recognises specific ratios of training to competition and competition-specific training. During the Active Start and FUNdamental stages, all activity should base on child's own willingness to play and participate and for that reason specific ratios are not given. However, when children make the step into Learn to Train stage a ratio of 70% of training to 30% of competition-specific training and actual competition is given. At Train to Train stage the ratio is changed to 60% of training to 40% competition-specific training and competition. At Train to Compete the numbers are 40% of training to 60% competition-specific training and competition. At the Train to Win stage, only 25% of time should be used in training and up to 75% to competition-specific training and competition. At Active for Life stage, the ratio is based on the passion and desire of each individual. (Canadian Sport for Life 2014, 41.)

3.2.9 System alignment

One important key factor in the LTAD –model is the system alignment. The LTAD –model is an athlete centered and focused model, which is driven by a coach and supported by administration, parents and sponsors. It works as a base philosophy and the engine for

the core business of all kinds of sport organizations. It may have also a great value and impact for coaching education. (Balyi, Way, Higgs 2013, 64-65.)

Collaboration and system alignment are vital for the LTAD –model and efficient implementation of the model depends strongly on those. It cannot be implemented without the health, recreation, sport, and education sectors performing together. For that reason, it is vital that all the sectors recognize their roles. Networking is one key factor to effective system alignment. System alignment leads to better quality in sport and bigger numbers in participation. It is a win-win situation, because the sectors benefit themselves from the collaboration and it becomes possible for everyone to be physically active and remain active for life. The ultimate goal is to define a collaboration pathway that addresses the need of each athlete and maximizes their potential. (Balyi, Way, Higgs 2013, 283; USA Hockey 2018; Canadian Sport for Life 2014, 44-45; Ultimate Canada 2016, 23; Canadian Basketball 2008, 18.)

3.2.10 Continuous improvement

The last key factor of LTAD is the continuous improvement. The world is changing all the time, including the world of sports. When a coach, an administrator or a sport organization wants to be able to keep the pace in this continuously changing world of sport, an incessant improvement and progression must take place. Change is often seen as a threat and is difficult for many, but for optimal development it is vital and must be implemented. (Balyi, Way, Higgs 2013, 63-64; USA Hockey 2018.)

The continuous improvement is one of the most important key factors in the LTAD –model. The records in different sports are constantly being broken and athletes are getting more explosive, faster, and stronger. That shows us that continuous improvement is needed in sports, just to keep up with the others. These improvements cannot happen without a change in the way of performing the daily actions. Coaches among children and youth should get more and more interested about the development of individuals and put not that much focus on the tactics and strategies. (Balyi, Way, Higgs 2013, 293; USA Hockey 2018.)

3.3 Stages of Long-Term Athlete Development

To be able to implement the LTAD –model, coaches and organizations must possess a complete understanding into the seven stages of the model. One key factor to be remembered is, that moving from a stage to another, should always be based on the development of an athlete and not only to chronological age. Chronological age may, and should also, be used as a guide, but as mentioned, other factors must also be observed. The fact that males and females develop at different tempo, must also be considered in the implementation process of the LTAD –model. The ultimate goal of this chapter is to offer a great understanding into each individual stage of the model. (Balyi, Way, Higgs 2013, 295.)

3.3.1 Active Start

Active Start is the first of seven stages of the LTAD –model. It covers the time from birth to age six in both genders. The key objective of this stage is to acquire fundamental movements and be able to use them in play. During this stage, the seed of love in sports can be planted and model of daily activity improved. During Active Start, young children should see and collaborate with athletic older role models. Physical activity is foundation for development of health throughout childhood, but essential during the period from birth to age six. Physical activity during Active Start does enhance the development of brain, coordination and motor skills. It helps also to strengthen bones and muscles, as well as, improves balance and fitness. (Balyi, Way, Higgs 2013, 300 & 301; USA Hockey 2018; Canadian Sport for Life 2014, 48; Canadian Basketball 2008, 25 & 30.)

During this stage, physical activity should be fun and a regular part the child's everyday life. Children should not be forced to be physically active, as well as, physical activity should not be over structured or planned. When children are going trough this first stage of the model, at least 60 minutes of physical activity should be a daily routine. It should be broken down into many short periods of activity. (Balyi, Way, Higgs 2013, 301; USA Hockey 2018; Canadian Sport for Life 2014, 49; Ultimate Canada 2016, 31-32; Canadian Basketball 2008, 25 & 30.)

Physical activity during the first six years of life is critical for brain development. Every time children are mental or physically active, brain and nerve cells must work together, which will lead to brain development. During the first six years of life, human brain produces millions of new brain cells, and billions of synapses. For that reason, it is vital for young children to stay active. Young children should play as much as possible during this stage, because while playing they have to adapt themselves into a great number of different body

movements, positions and play situations. That will teach brain to control these many different movements and positions and that way lead to development in brain. (Balyi, Way, Higgs 2013, 302; USA Hockey 2018; Canadian Sport for Life 2014, 49.)

During the stage of Active Start, the body develops in different ways. First of all, bones and muscles start to strengthen, because as children develop, they set more and more stress on those. The limbs must be strong enough to carry the weight of the body, before a child can learn walking. When the limbs are developed and able to carry the weight of the body, children may start to learn to walk. However, for any movement to take place, the brain and muscles must work together. Usually at around the age of two, the nerve development is evolved enough for that to happen. The biggest improvement in the brain during the stage of Active Start is the increased amount of brain cells and connections produced between them. Also senses, such as, sight, balance, and kinesthesia develop rapidly during this stage. (Balyi, Way, Higgs 2013, 305 & 306.)

During the Active Start children should be engaged with different kind of activities to ensure optimal development. They should perform activities that teach them locomotor skills. It means moving from a place to another by using different styles, such as, crawling, walking, running, jumping, and rolling. Children should also be engaged with activities that require body control skills. Skills that are seen as a body control skills are, for example, balance, coordination, and kinesthesis. Sending and receiving skills, such as, pulling and pushing, throwing and catching, kicking and receiving, should also be learned during this stage through plays that are based on fun and enjoyment. During Active Start, children should be jumping and hanging, because that way they are able to strengthen their growing bodies. They should develop their body orientation skills by placing themselves in a wide variety of positions. By rolling or being upside down, the brain is able to learn to orient itself and to control different body parts in unusual positions. (Balyi, Way, Higgs 2013, 308 & 309; USA Hockey 2018; Ultimate Canada 2016, 31-32.)

3.3.2 FUNdamentals

During Active Start, children have usually learned the basic movements of sitting, standing, walking, and running. When they move to FUNdamentals stage, they are skilled at these. In FUNdamentals stage, children are going to master the fundamental movement skills, which will become cornerstones for the process of learning sport-specific skills. It is vital for children to develop themselves a solid base of fundamental movement skills, because otherwise learning sport specific skills becomes remarkably difficult. For instance, if the fundamental skill of kicking is not learned during FUNdamentals stage, individual will

face a great challenges learning any of sport-specific skills that involve kicking. (Balyi, Way, Higgs 2013, 320 & 321; Hockey Canada 2013, 12; USA Hockey 2018; Canadian Sport for Life 2014, 51; Ultimate Canada 2016, 33-35.)

There is a great amount of fundamental movement skills that should be learned during this stage. By doing so, one is able to build a solid base for learning sport-specific skills in the future. These skills are, for example, turning, stopping, pushing, spinning, walking, running, and many more. In addition to these skills, it is vital for children to learn some fundamental skills, which are nonspecific. These skills are: agility, balance, coordination, and speed. (Balyi, Way, Higgs 2013, 321-323; Hockey Canada 2013, 13-14; USA Hockey 2018; Canadian Sport for Life 2014, 51; Canadian Basketball 2008, 25.)

The LTAD –model includes four environments in which fundamental movement skills competence should be mastered. These are on land, in water, on ice and snow, and in the air. Skills on land are covered already in earlier paragraph. In water children should improve their skills in floating, swimming, jumping, and diving. On ice and snow they should learn to slide. In the air the fundamental movement skills to be learned are related to the ability to orient the body. It means that individual is able to recognize if he or she is upside down or twisting in the air. (Balyi, Way, Higgs 2013, 324; Hockey Canada 2013, 13-14.)

Children do not mature and learn in the same rhythm. However, nearly all children learn fundamental movement skills equally and go through the same stages. In the beginning of life, the brain is not matured enough, and the muscles strong enough, for a child to learn barely any skills. During this phase, it is important that child is allowed to try and explore all possible movements. At some point, child is matured enough to start learning skills. Usually skills start to develop naturally, but learning can be greatly accelerated by providing opportunities for fun practice. There is a time of accelerated learning for every skill. During these phases of accelerated learning, children should be supported with simple and unforced instructions and practice. If these phases are not recognized and utilised, then learning may become much more challenging. (Balyi, Way, Higgs 2013, 325-326; Hockey Canada 2013, 19.)

As already mentioned above, the development of the basic movement skills is vital at the FUNdamental stage. Time in the practice should be used on training those skills and everything should happen in a fun environment. Minor part of the time can be invested to fundamental sport skills or sport-specific technical skills. Time should not be used on training strategies or tactics, during this stage. Small-area games should be favoured to teach children how to play sports and to improve their games understanding. Ratio to be used for

training and competition should be 4:1. Three quarter of the training time should be used playing various small-area games, and one quarter for warming up, instructions etc. Children at this stage are just willing to have fun and need to keep having fun. Otherwise there is a great chance for dropping out from the activity. Extra attention should be placed on ensuring that all children are handled equally. (Balyi, Way, Higgs 2013, 327 & 328; Hockey Canada 2013, 12; USA Hockey 2018; Canadian Sport for Life 2014, 50-51; Ultimate Canada 2016, 33-35.)

3.3.3 Learn to Train

Time between the ages of 9 and 12 is crucial for the skill development. During this period of time, window of accelerated adaptation for fundamental movement and sport skills are open. At this point, children have reached the stage, where they are capable to acquire the general sport skills. These skills are the foundation of all athletic development in the future. During this stage, usually, both genders experience the growth spurt, which opens the possibility for more structuralized methods. Nevertheless, the focus should be held on general sport skills. (Balyi, Way, Higgs 2013, 335-336; Hockey Canada 2013, 40; USA Hockey 2018; Canadian Sport for Life 2014, 52-53; Canadian Basketball 2008, 36.)

At the Learn to Train stage, the nervous system is properly developed and children are able to perform processed technical skills. It means that fundamental movement skills must be improved and advanced, during this period of time. Children who mature later have a benefit when it comes to learning skills. Their Learn to Train stage lasts longer and in that way the window of accelerated adaptation for skill learning stays longer open for them. The Learn to Train stage ends when puberty and the growth spurt begins. Skills that have been learned or not learned during this stage, will have a big effect on the level that is possible for one to achieve in the future. (Balyi, Way, Higgs 2013, 335-336; Hockey Canada 2013, 40 & 45; Canadian Sport for Life 2014, 52; Canadian Basketball 2008, 27 & 36.)

At this stage, children will face the onset of growth spurt. Coaches and parents should proceed regular measurements every three months. The idea with the measurements is to provide an indicator for the start of peak height velocity. Normally the growth spurt lasts 18 to 24 months. (USA Hockey 2018.)

During the stage of Learn to Train, focus should be on developing athleticism, because of its positive effects on long-term success. In team sports, children should play all positions or in individual sports like track and field, do many events. By doing so, children will learn to understand the sport better. (Balyi, Way, Higgs 2013, 337; USA Hockey 2018.)

As already mentioned above, the development of fundamental movement skills is crucial at the Learn to Train stage. However, the fundamental sport skills and technical skills should also be practised. Basic strategies can also be used, because the level of understanding is continuously developing. In team sports, understanding team play can be improved with simple tactical inputs. In individual sports, it comes to how sport is performed. Focus should always be in own tactics and those should not be adjusted to opponents' strategies. Training time, however, should not be used on teaching tactics. (Balyi, Way, Higgs 2013, 338-339; Hockey Canada 2013, 44-45; USA Hockey 2018; Canadian Sport for Life 2014, 52-53; Canadian Basketball 2008, 27.)

Psychological skills, such as, relaxation, imagery, goal setting, concentration, communication, and motivation are also to be introduced. Goal setting is one important part during this stage, because children are starting to have goals. Athletes need goals to aim for, because that way they feel that they have a direction and hours that they use for training and competing have a meaning. The differences among different types of goals (long-, medium-, and short-term) should be introduced and explained. (Balyi, Way, Higgs 2013, 339.)

During this stage, competition should always be about athlete development. Results are one indicator of the work that has been done, but should never be the most important one. Athlete's development in movement skills, sport skills, and in decision making should be observed and monitored. It is also important that the training-to-competition ratio is properly planned and executed. In team sports the 70:30 ratios are suggested. 70 percent of the time should be used for training and 30 percent in competition. At this stage it is all right to make mistakes. Young athletes should be encouraged to try different things and learn from mistakes that will surely occur. (Balyi, Way, Higgs 2013, 343-347; Canadian Sport for Life 2014, 41)

3.3.4 Train to Train

The Train to Train stage is potentially the most important stage of the LTAD –model. During this stage, most young athletes from both genders go through puberty. The biological, physiological, sociological, mental, and emotional development processes make this stage complex and challenging. During puberty a great amount of factors must be taken into account. (Balyi, Way, Higgs 2013, 353.)

At this stage, young athletes should start to limit their focus to two sports. Competition seasons of these two sports should be at different seasons, and that way not conflict with

each other. Specialization to one sport year-round is not recommended at this stage. However, toward the end of Train to Train stage, many athletes start to focus on a single sport. (Balyi, Way, Higgs 2013, 353; Hockey Canada 2013, 53; USA Hockey 2018; Canadian Sport for Life 2014, 57.)

At this stage, young athletes should be able to strengthen, sophisticate and develop basic skills in the sports they are competing in. Decision-making skills keep on improving, as well as, speed, strength, endurance, and flexibility qualities. Those qualities will, however, not improve by doing nothing. A great value should be set in building a strong aerobic base, improving speed and strength qualities, and to further improve sport-specific technical and tactical skills. During this stage, sensitive periods of accelerated adaptation to training all those three (aerobic, speed, and strength) are open and should be utilized. Training and competition ratios follow commonly 60 percent to training and 40 percent to competition split. (Balyi, Way, Higgs 2013, 353-354; Hockey Canada 2013, 50; USA Hockey 2018; Canadian Sport for Life 2014, 56-57; Ultimate Canada 2016, 43-44.)

At Training to Train stage the body is to ready to develop physiological functions during puberty. The heart and the lungs are improving fast, blood volume is increasing, estrogen and testosterone production is increasing, and muscle mass and fat mass increase fast. (Balyi, Way, Higgs 2013, 354.)

At this stage, athletes begin to play and compete with similar rules to adults. It means that coaches are also beginning to bring up tactics more and more in everyday actions. Tactics should support game sense, that is already improved through small-area games in the early youth. Training of fundamental movement skills and technical sport skills must be continued, and led and supervised by qualified coaches. By doing so, one is able to guarantee that athletes receive right type of feedback and corrections. During this stage, skills must be further applied in game environment and situations. (Balyi, Way, Higgs 2013, 356; Hockey Canada 2013, 50; USA Hockey 2018.)

At this stage, athletes should be working on with the basic physiological skills that were introduced in Learning to Train stage: relaxation, imagery, goal setting, concentration, communication, and motivation. During this stage, athletes are going to be introduced into analyzing their personal strengths and weaknesses. Goal setting should be a part of season planning and it should include short-, medium-, and long-term goals. Athletes should be introduced also to self-talk skills and training, and they should be working on those skills. (Balyi, Way, Higgs 2013, 357; Hockey Canada 2013, 50 & 53; USA Hockey 2018.)

At the Train to Train stage, athletes face a high possibility of overtraining, and burnout. To prevent that, it is vital to track training loads, performances and competitions. Other kind of recovery data like resting heart rate and quality of sleep, may and should be recorded on daily basis. Stretching should be used as a daily, prior to bedtime, routine. Also a great focus should be set on nutrition and hydration. (Balyi, Way, Higgs 2013, 358; Hockey Canada 2013, 53; USA Hockey 2018.)

3.3.5 Train to Compete

Athletes that reach the Train to Compete stage have a serious commitment for reaching their goals. Individual career plans and individual programs must be well planned and analysed. Crucial aspects of life such as education need to be included into planning. Athletes should start to build a vision about their future in sports and in life. As with others stages of the model, the steps into and out of the Train to Compete stage do not take place at clearly defined points in time. These steps occur as a result of a great amount of key indicators like biological maturation, overall capability in execution of sport skills, and progress toward sport mastery. This timeframe is not equal by each individual athlete. However, the typical chronological ages for males are from 16 to 23+ years, and for females from 15 to 21+ years. (Balyi, Way, Higgs 2013, 369.)

At this stage of the LTAD –model, athletes should be able to improve and maintain their physical capacities, and to improve their technical, tactical, and playing skills. During the Train to Compete stage, athletes take a big step forward, when it comes to level of specialization in a certain sport, position, discipline, or event. Also the need and importance for, well planned and executed, recovery and regeneration programs grows. Individualization in variety of programs and career plans increases at this stage. Time that is used for training the technical and tactical skills reduces and focus is more set to competition and competition-specific training. (Balyi, Way, Higgs 2013, 369; Hockey Canada 2013, 59; USA Hockey 2018; Canadian Sport for Life 2014, Canadian Sport for Life 2014, 58; Ultimate Canada 2016, 48-49.)

At the Train to Compete stage, athletes should have found a balance in training and competition among fundamental movements skills, sport technical skills, strategies and tactics. Athletes start to match their style of playing the game into their physics. For example, some ice hockey players may use their size and power to play the physical game, which is based on playing without a puck. Whereas, other players may base their game on great puck management skills and skating abilities. Coaches should be able to design individual programs for both players. At this stage, it is vital for athletes to be able to refine their skill

execution, train with speed and pressure that exist in a game situation, build tactical awareness, and raise the level of competition. (Balyi, Way, Higgs 2013, 370.)

During the Train to Compete stage, athletes should be able to strengthen their technical, tactical, mental, and physical preparation. Maturation of an individual plays a great role in determining training programs and periodization at this stage of LTAD. Late maturers should also be given a chance into elite sport, because if that is not the case there is a big possibility for losing great talents. (Balyi, Way, Higgs 2013, 373.)

3.3.6 Train to Win

The Train to Win stage is the ultimate performance stage of the LTAD –model and stands for the final stage of athletic preparation. During this stage, sport- and position-specific skills together with physical, technical, tactical, and mental skills, are going to reach the maximum capacity. As with all other stages of LTAD, the step to this stage is not a clearly defined point in time. It is again a combination of different indicators such as biological maturation and execution capability. (Balyi, Way, Higgs 2013, 375-376; Hockey Canada 2013, 60; USA Hockey 2018; Canadian Sport for Life 2014, 59.)

During the Train to Win stage, it is crucial for athletes to be able to further develop and maintain their physical capacities together with technical, tactical, and playing skills. They must also integrate recovery and regeneration programs into their training and competition processes. Coaches must know and understand the strengths and weaknesses of their athletes. Only by doing so, they are able to plan and execute programs that will allow their athletes to reach the top in their sport. (Balyi, Way, Higgs 2013, 376; USA Hockey 2018; Canadian Sport for Life 2014, 59.)

At the Train to Win stage, fundamental movement skills, sport technical skills, and strategies have reached the ultimate level and should be refined to suit chosen tactics. Tactics is the priority now. Athletes must get familiar with the strengths and weaknesses of their opponents and rivals, if they are willing to reach podium. Coaches maximize fitness preparation of their athletes and refine their skills tactically. Taper and peak must be maximized at this stage. (Balyi, Way, Higgs 2013, 377; Hockey Canada 2013, 60; Canadian Sport for Life 2014, 59.)

The Train to Win stage is the achievement stage of the model. All the skills learned during the earlier stages must be now taken into action. Athletes should now be able to maximize their potential and perform. They must attain healthy habits when it comes to eating,

sleeping, and recovering. Athletes should love winning and hate losing, but not forget ethical manners. Temptation to take shortcuts may be sometimes high, but ethical manners and own values must always be present. (Balyi, Way, Higgs 2013, 377; Hockey Canada 2013, 61.)

At this stage, in team sports one quarter of time in the sports should be invested in training, and the rest – three quarters – on competition and competition specific training. (Balyi, Way, Higgs 2013, 377; Canadian Sport for Life 2014, 41.)

3.3.7 Active for Life

The Active for Life is the last stage of the LTAD –model. Not everyone will, or is capable, to compete at professional or top level in sports, but it would be beneficial for everyone to stay active and participate in sports, throughout their life. Lifelong participation in sports may happen in different roles such as an athlete, coach, official, administrator, parent, or volunteer. (Balyi, Way, Higgs 2013, 382.)

The Active for Life stage has three different streams: Competitive for life, Fit for life, and Sport and physical activity leaders. Competitive for life, is a stream for individuals who love to play games and participate in championships, but not striving for professional contracts. For these athletes is important, that they face appropriate and meaningful competition, because competing is their passion. Fit for life, however, is a stream that includes all physical activities such as gym, running, yoga and Nordic walking. The main goal is to stay fit and healthy for life. For these individuals it is vital that they enjoy the activity they are performing, because feeling good makes them continue. Sport and physical activity leaders, is a stream for people, who enable sport and physical activity to exist. These individuals may be coaching or instruction, officiating, administrating as a volunteer or professional, or working in sport science or sport medicine. (Balyi, Way, Higgs 2013, 383-388; Canadian Sport for Life 2014, 60-61.)

Trend of decreasing physical activity, which leads to increasing obesity, has been going on already a while. Advancements in technology have been powerful in decreasing the need to be active and to move. Children are staying indoors, and outdoor games have gone through an inflation. It seems that the benefits of an active lifestyle have been forgotten. Individuals who gather supplementary physical activity have usually elevated energy and concentration levels, as well as, improved self-esteem, and better behavior. Active lifestyle improves cognitive abilities and information processing. Older people who stay active for life exhibit faster decision-making processes and memory capabilities. (Balyi, Way, Higgs 2013, 384.)

Physical activity for lifetime is good for everyone. It helps to decrease the levels of childhood and adult obesity. Active lifestyle improves mental health and decreases the risk of different chronic diseases. Aged people profit a lot from staying active for life. Probability of falls and broken bones decreases, and they receive support for age-related diseases. (Balyi, Way, Higgs 2013, 384.)

4 Purpose and methodology of the research

Ice hockey is a sport that is nowadays played almost all over the world. However, the level of know-how and resources vary greatly between the hockey nations based on their success, number of players and history among the sport. The purpose of this study is to clarify, by using a benchmarking concept and a quantitative survey, the need for an international coaching tool, as well as provide suggestions for the content of the tool. This tool would be published by the International ice hockey federation, IIHF.

4.1 Purpose and objectives of the IIHF Player Development Guide

In the year 2017 the IIHF recognized a need for a new coaching tool for its member National Associations in all over the world. This new tool, The IIHF Player Development Guide, is directed to the member National Associations of the IIHF and, more precisely, to the sport responsible both in the associations and the clubs. The main objective for the IIHF Player Development Guide is to develop ice hockey throughout the world by offering a knowledge about the different areas of the sport. The tool is to be used when the member National Associations are planning, organizing and executing their national programs.

4.2 Research questions and objectives the research

Research questions have a vital role in a successful research. The researcher should use quite some time in the beginning of the whole research process, to really consider the research questions. That will help the researcher a lot, when he or she is starting to gather the literature for the research. It is also possible, and totally normal, that the research questions will change during the process. (White 2017, 4)

As already earlier discussed, the goal of this research, is to provide understanding into the IIHF Player Development Guide. It is going to offer propositions for the content of the IIHF Player Development Guide as well as reasoning why it should be produced. Based on that, the research questions are:

1. What is the reasoning behind the IIHF Player Development Guide –project?
2. What should be included in the IIHF Player Development Guide?

Now when the research questions have been stated, the objectives of the research may be clarified to be the following:

1. Provide reasoning for the IIHF, as an international sport federation, for investing money and time on the execution of player development pathway

2. Provide the IIHF PDG Workgroup a concrete proposal for the content of the IIHF Player Development Guide

4.3 Research methodology

This research was consisted of three different parts: the examination process on the Long-Term Athlete Development Model (LTAD –model), benchmarking process between the International Ice Hockey Federation, IIHF, and the Fèdèration Internationale de Football Association, FIFA, and the PDG Survey.

The objective of the examination process on the LTAD –model (LTAD), was to provide knowledge on the development process of young athletes. The LTAD –model is a widely used and recognized framework, which is based on the physiological facts of the human maturation. lt was seen as a framework that could provide a great amount of information for the research.

The need for a quantitate research was recognized already at the very beginning of the process. Quantitative data from the field, was seen as a vital element for a successful research and a coaching tool, PDG. The objective of the PDG Survey was to provide information from the people working among the young athletes in the member national associations of the IIHF.

The third, and last, of the research methodologies was the benchmarking process. It was seen as proper tool to be used, when one is willing to learn from the best in the industry. The sport world is full of different kind of player development guides and manuals, provided by clubs, national associations and global governing bodies from a variety of sports.

5 Stages of the study

This study was consisted of three different parts: examination of the Long-Term Athlete Development -model, PDG survey and the benchmarking process between the two global governing bodies in the sports of ice hockey (IIHF) and football (FIFA). The aim of this chapter is to provide understanding in all of these three stages.

5.1 Long-Term Athlete Development -model

The study started with the examination process on the Long-Term Athlete Development -model (LTAD –model). The aim was to familiarize the researcher with the model, which is serving as a foundation for the sport development processes around the world, and to provide propositions on the content of the IIHF Player Development Guide.

This stage consisted of gathering knowledge on the topic by investigating the literature provided on the LTAD –model as well as the athlete development models provided by different organisation within different sports and nations.

5.2 PDG Survey

PDG Survey was compiled by a survey workgroup in which a researcher had an active role. The survey took place in the IIHF Development Camp, which was organized in July 2017 in Vierumäki, Finland.

5.2.1 Survey Methodology

PDG Survey was executed as a quantitative research by using a survey methodology, in the form of a semi-structured questionnaire. The questionnaire was a combination of open-ended and closed questions. The survey questions were based on the brainstorming of the PDG Survey compilers and the feedback from IIHF Player Development Guide – workgroup experts. The questionnaire included a total of 47 questions, and was answered by 67 respondents out of the potential 97. The relatively low number of respondents is explained by the communication problem between the survey compilers. This lack of communication led into a situation, in which one of the target groups was not requested to answer the questionnaire during their classroom session. Link to the questionnaire was sent to the group members after the last session in the 2017 camp and followed with a reminder in a week after the camp was finished, but only 19 out of possible 34 answers were gathered.

5.2.2 Goals and the target group of the survey

The PDG Survey was first compiled and after executed as one part of the IIHF Player Development Guide –process. The goal of the survey was to acquire knowledge about the need for such a framework as the PDG as well as about, what are the needs for the content of the guide. The third goal of the survey was to gather data about the views that the respondents have, when it comes to coach education and development. The survey was targeted for the member National associations of the IIHF, and more precisely for the individuals from these member associations, which were participating one of the four programs in the 2017 IIHF Development Camp. These programs were: the coaches program, the goalkeeper coach program, learn to play program and the MNA leadership program. By executing the survey during the camp, the compiler group was able to reach a group of 67 persons from different positions inside the sport of ice hockey.

5.2.3 Survey analysis

As mentioned before, the survey was put together and executed by a compiler group in which the researcher had an active role. However, the survey analysis is done totally by the researcher himself.

The survey included also questions that are not directly related to the research questions of this thesis. That is the case, because this thesis is only one part of the bigger IIHF Player Development Guide –process, and some other studies are done, based on the same data and material. This analysis will mostly focus on to the questions that are providing important data on the two research questions. More precisely, the question that is focused on the need for such a tool as IIHF Player Development Guide as well as the question that concentrates on the content of the guide, are analysed. Some questions in the survey are not being analysed, because the close correlation to the research question was not found.

5.2.4 Background of the respondents

The survey questions from one to three were focused on gathering a basic knowledge about the respondents. Goal was to acquire information about the program that respondent was attending at as well as the position of the respondent within ice hockey and the position of his or her country within the IIHF Men's World Ranking.

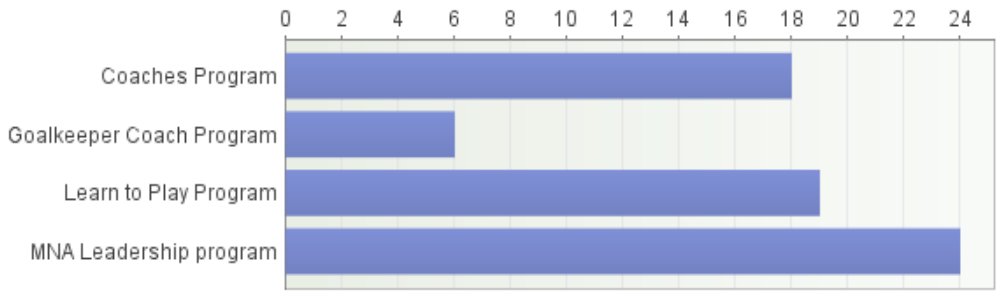

Figure 7. Which Program are you attending at camp? (n=67)

As the figure 7 expresses, the respondents were divided quite equally between three programs of the camp: coaches program (18), learn to play program (19) and MNA leadership program (24). However, the fourth program, goalkeeper program, was represented only by 6 respondents.

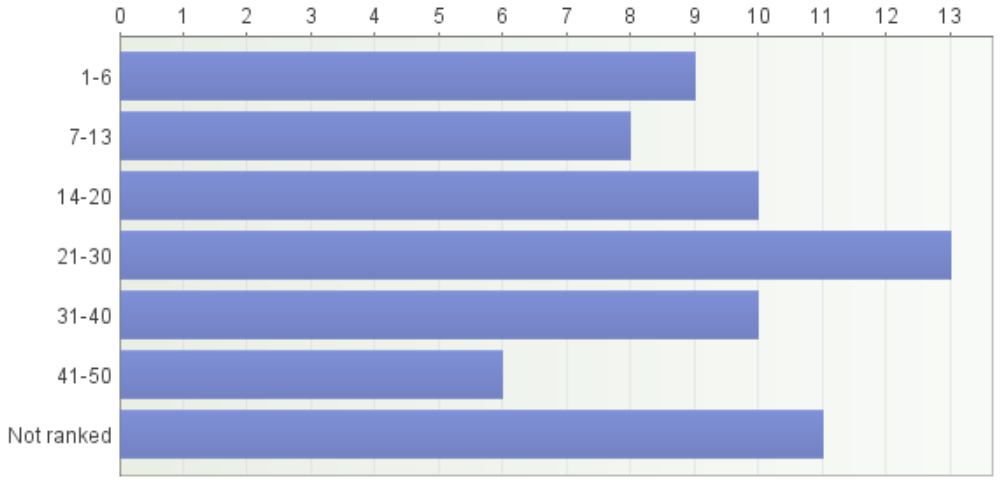

Figure 8. In which position is your country within the IIHF Men's World Ranking? (n=67)

The biggest group of respondents (13) were representing member National associations (see figure 8) with the position 21 to 30 within the IIHF Men's World Ranking. An interesting finding was, that the second largest group of respondents (11) came from the countries which are not ranked at all. Only nine respondents were from the top six ranked hockey nations.

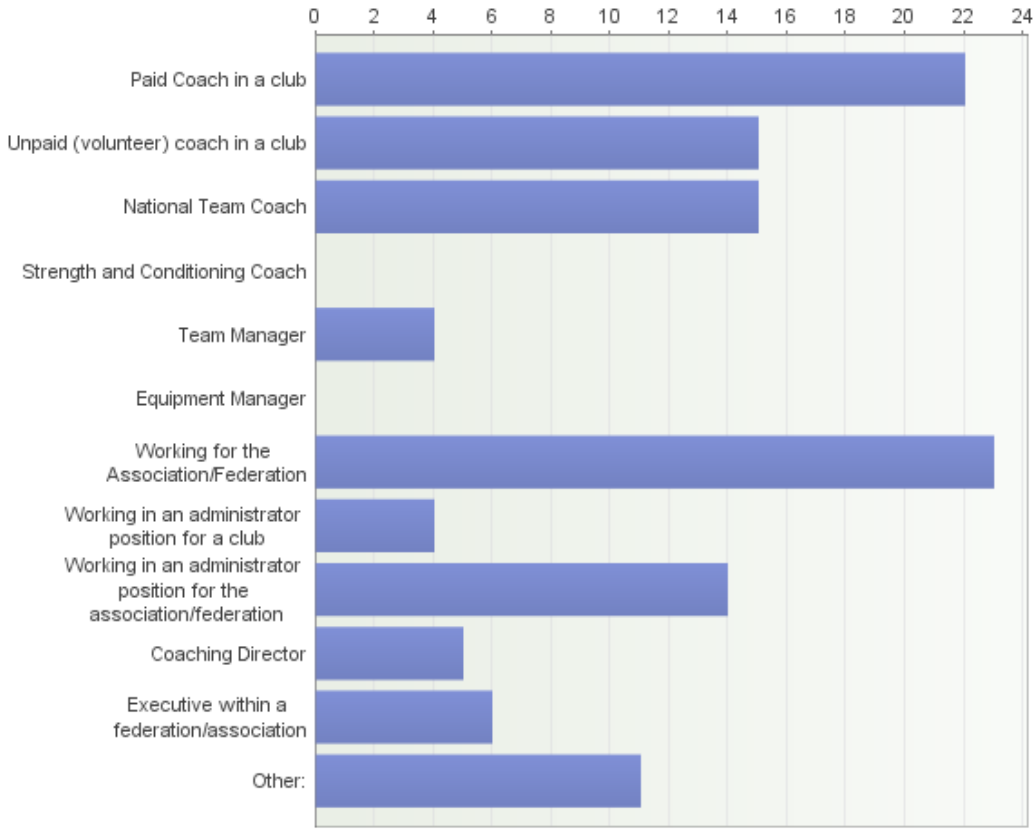

Figure 9. What is your current position within ice hockey? Check all that apply. (n=67)

In the third question (see figure 9) the respondents were asked to choose all the descriptions that apply to their current position within ice hockey. A total number of 23 respondents answered that they are currently working either for the association or for the federation, when it was offered as a possibility. Instead, if one is working in a club was not directly provided as an answer, and for that reason it is impossible for the researcher to verify the exact amount of respondents working in the clubs. However, it was asked if one is working as a paid coach in a club (22), unpaid coach in a club (15) or as an administrator in a club (4). This way it is possible to come up whit a conclusion that, at least a group of 41 respondents were working in a club. It is also possible to make a presumption that when 23 respondents answered that they are working either for the association of the federation, 44 of the respondents are working in a club.

A group of 52 respondents verified, that they are currently working as a coach and five as a coaching directors. An interesting finding was, that none of the respondents was working as a strength and condition coach. A total number of 18 respondents stated that they have a role as an administrator either in a club or in an association or federation. Four respondents were working as team managers.

5.2.5 The need for the IIHF Player Development Guide

With the second part of the questionnaire, the goal was to provide information about the need for such a framework as a IIHF PDG, and simultaneously answer to the first research question.

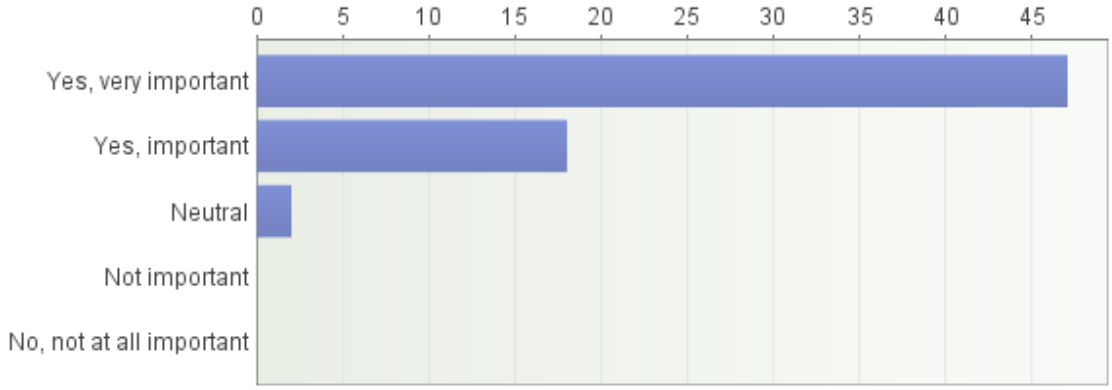

Figure 10. Do you think it is important that the IIHF produces a framework PDG? (n=67)

As we see in the figure 10, when the respondents were asked to express their opinion about the importance for IIHF to produce a framework PDG, 65 out of the possible 67 respondents saw that it is either important or very important.

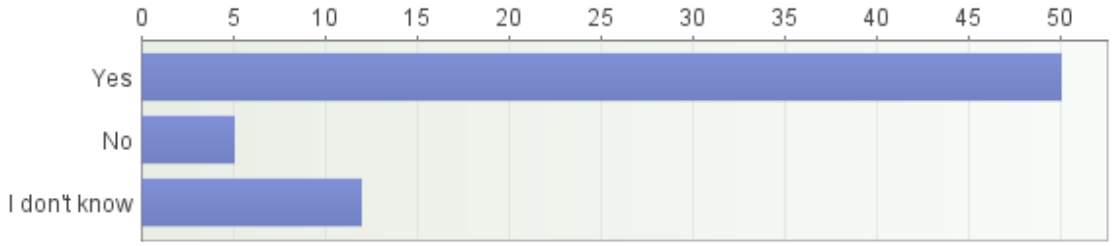

Figure 11. Should the PDG be mandated by Member Associations? (n=67)

When asking, if the PDG should be mandated by the member National Associations of the IIHF, a great majority of the respondents gave yes as an answer (see figure 11).

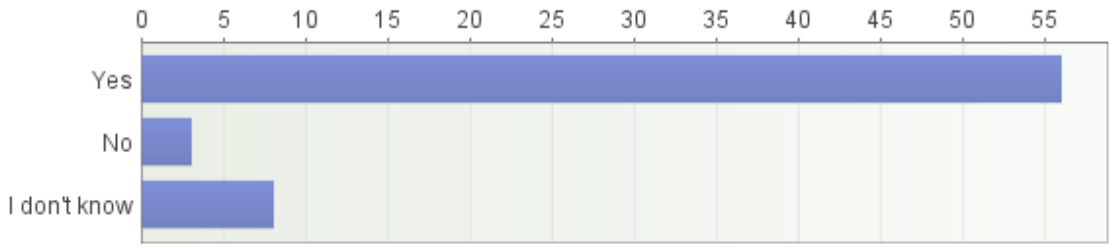

Figure 12. Do you think your National Association would use such material? (n=67)

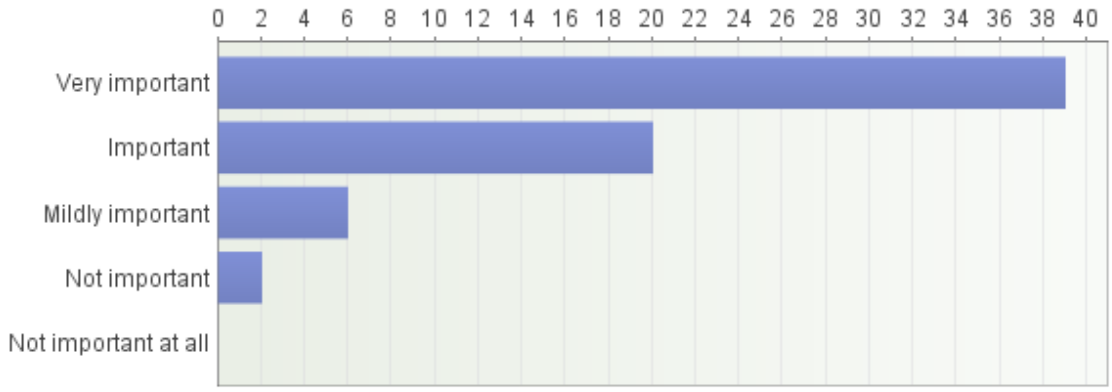

Figure 13. How important is it for your National Association to get such material? (n=67)

The figure 12 points quite clearly out the fact, that the majority of the respondent group is seeing that his or her county would use such a tool in their work. Also when they were asked, how important it is for their National association to acquire such material, the great majority stated that it is either important or very important (see the figure 13).

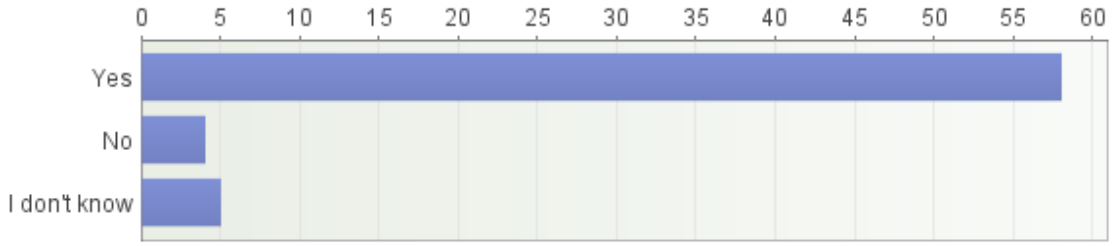

Figure 14. Would the PDG be beneficial for you in your role within your position? (n=67)

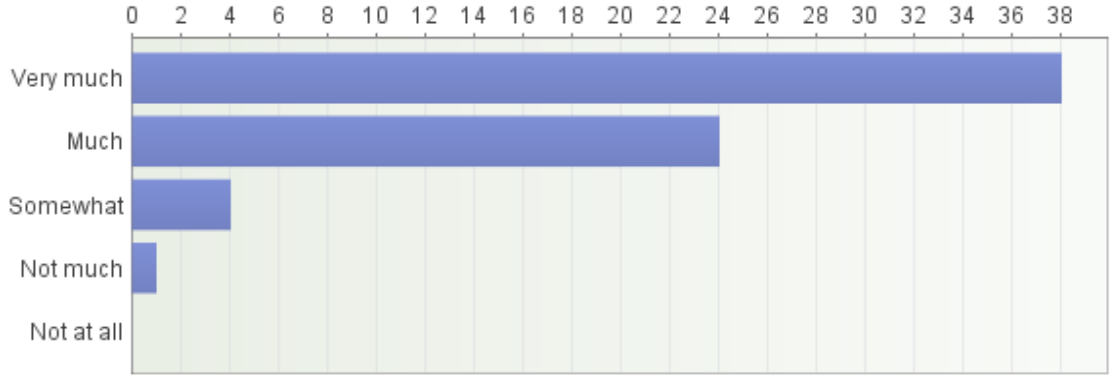

Figure 15. Do you think the PDG will help guide the development of both players and coaches? (n=67)

The figure 14 clarifies, that the majority of the respondents saw that the PDG would be beneficial for them in their work. In addition, as the figure 15 states out, understanding

was that the PDG would help to guide the development of both players and coaches either much or very much. Only one respondent saw that the PDG would not offer much help.

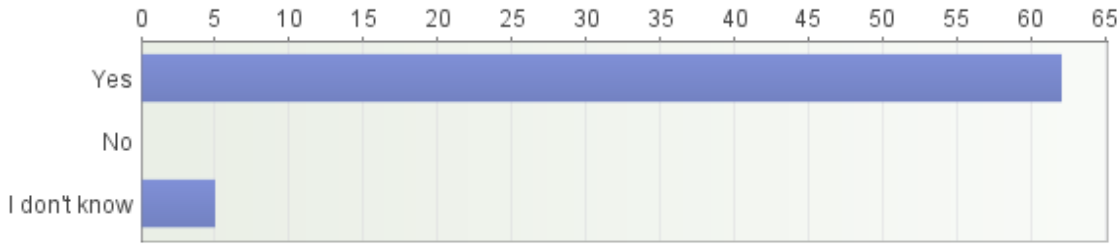

Figure 16. Do you think PDG guidelines will help coaches to prepare better training sessions? (n=67)

As we may see above in the figure 16, when the respondents were asked if they feel that the PDG guidelines would help coaches to prepare better training session., they were quite unanimous with their views. 62 respondents gave yes as an answer and only 5 told that they don't know.

5.2.6 The content of the IIHF Player Development Guide

The third part of the questions was planned to gather information for the second research questions. The respondents were asked by multiple questions to share their thoughts, about the possible content of the PDG.

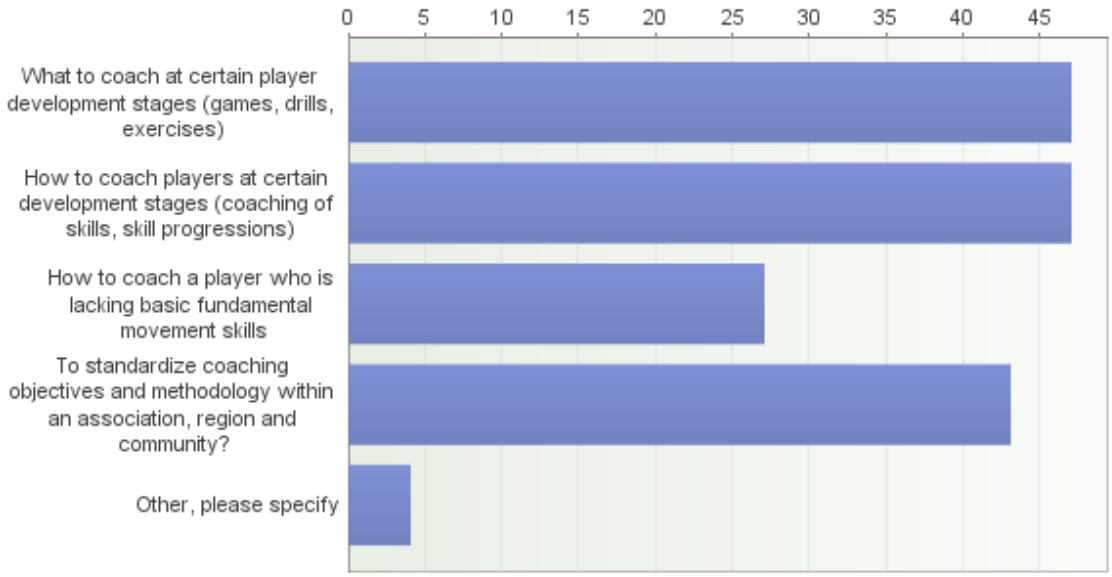

Figure 17. What are your needs considering PDG material? Check all that apply. (n=67)

In the figure 17, the respondents were asked to clarify their needs considering the material in the guide. They were provided with four possibilities as well as with a field were they were able to give their own proposals. As we see, the four possibilities that were provided for the respondents gathered relatively much endorsement. However, only four respondents gave an answer, when they were provided with the open-ended question, where they would have been able to offer their other needs for PDG material.

Based on the answers that are seen in figure 17, the biggest needs seem to be in, how and what to coach at different development stages. 46 respondents out of the possible 67 stated that they have needs for material in this specific area of player development.

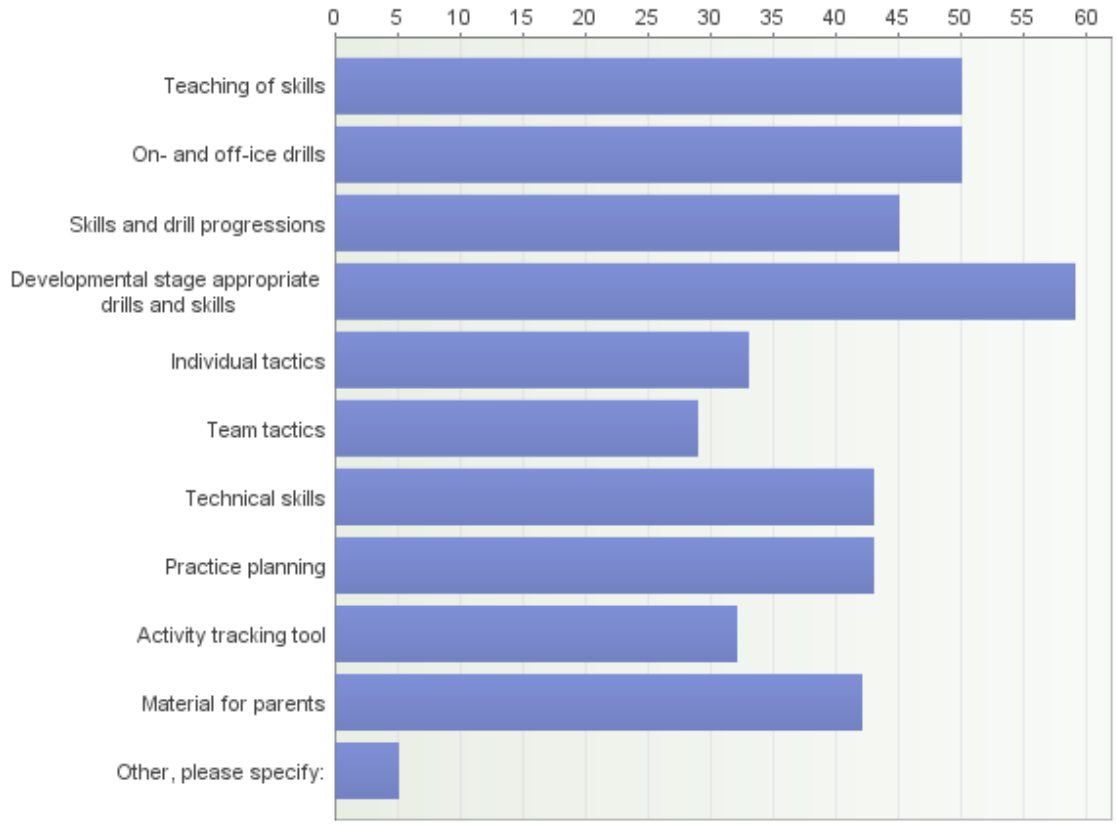

Figure 18. What material would you like to find in the PDG? Check all that apply.(n=67)

The figure 18 is still about the material that should be included in the PDG. Respondents were again provided with 10 different possibilities as well as with the open field, where they were able to write their own ideas. As we may interpret from the figure 18, developmental stage appropriate drills and skills was the most wanted subject. Up to 59 respondents out of the possible 67 expressed that he or she would like to find material related to the subject.

Again only very few (5) shared their own ideas (see Figure 18), when they had the chance to specify them. In these five open answers that were given, materials related to the communication came up twice.

The figures from 19 to 22 were all gathering data on respondent's thoughts, if they need information concerning to different areas of coaching and player development. The respondents had a possibility to answer between yes, no and I don't know.

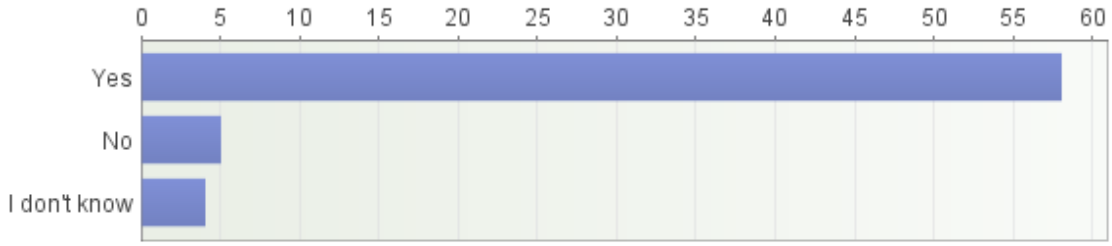

Figure 19. Do you need information on proper nutrition, recovery and rest in the PDG? (n=67)

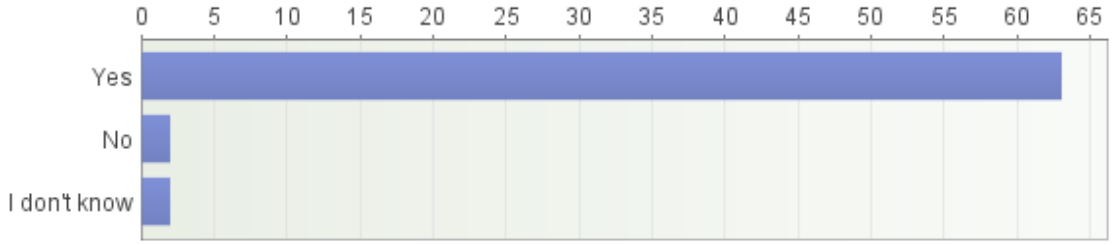

Figure 20. Do you need information on the development of speed, stamina, strength, endurance, flexibility and mobility in the PDG? (n=67)

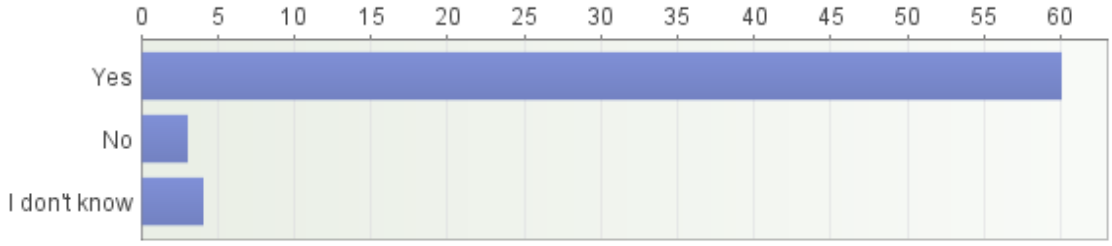

Figure 21. Do you need information on emotional, cognitive, physiological growth and development? (n=67)

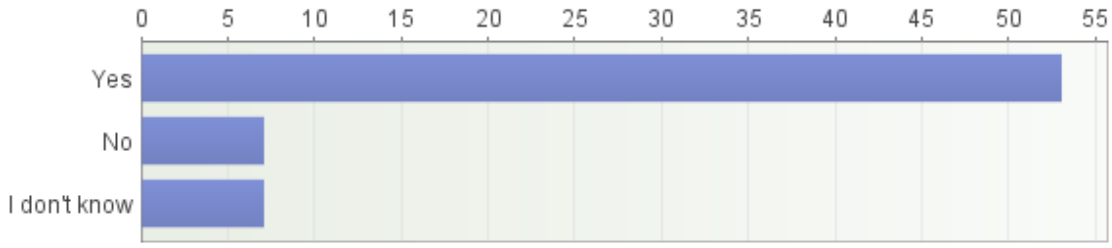

Figure 22. Do you need information on how to develop communication and social skills of players?

As we see in each of the four figures above (19 to 22), a great majority of the respondents feel that they would need information in the PDG, about all of the areas they were provided. The biggest demand seems to be for an information on the development of speed, stamina, strength, endurance, flexibility and mobility, because 63 respondents out of the possible 67 expressed their need for that (see figure 20). When the respondents were asked, do they need information on emotional, cognitive and physiological growth and development a group of 60 answered yes (see figure 21). 58 respondents verified that they would need information on proper nutrition, recovery and rest (figure 19) as well as 53 think that they would like to find material related on communication and social skills of players (figure 22).

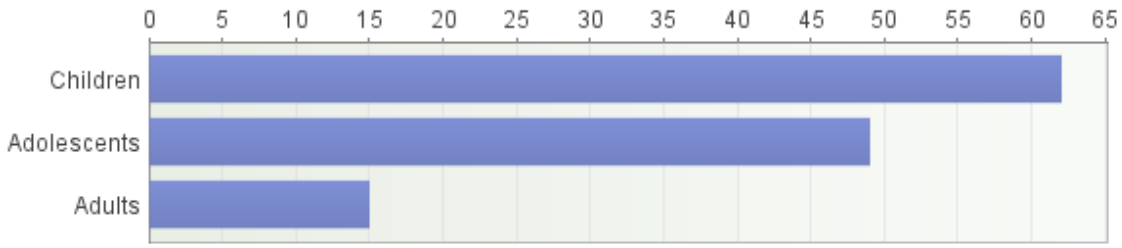

Figure 23. What are the player ages you wish to focus on? Check all that apply. (n=67)

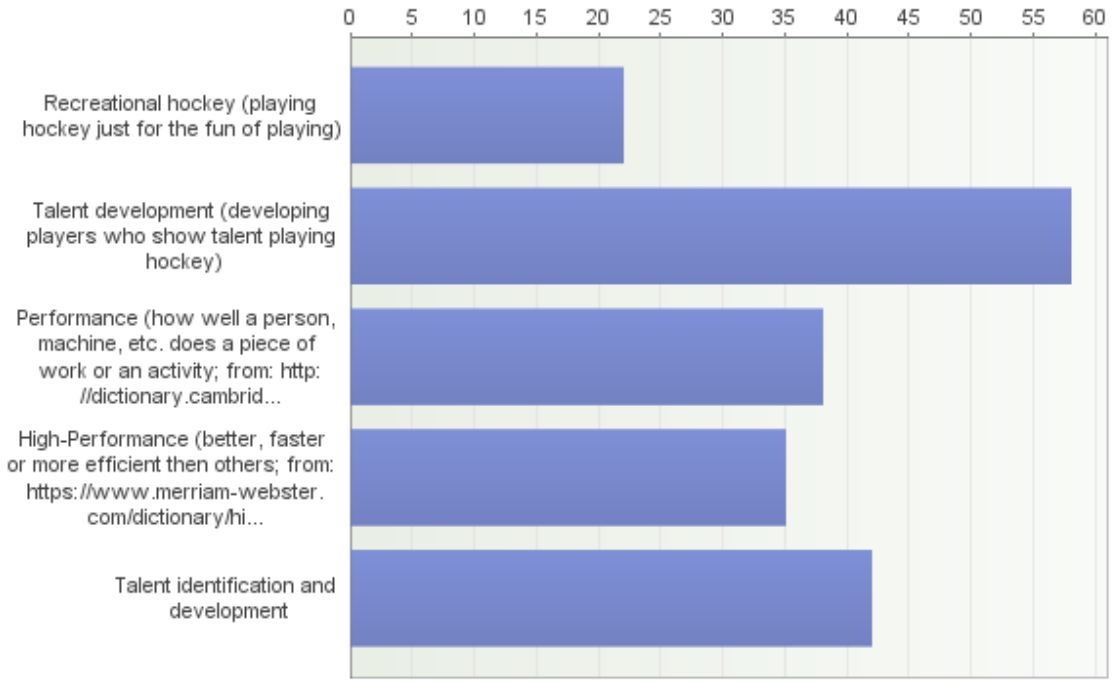

Figure 24. Which competitive levels do you wish to focus on? Check all that apply. (n=67)

The respondents were also asked about the ages of the players (figure 23) and the competitive levels (figure 24) they would like to focus on. They were again asked to check all the possibilities that apply for them.

As we may see in figure 23, a great amount of respondents stated, that they would like to focus on the children and adolescents, when they were provided with three possibilities: children, adolescents and adults. However, only 15 respondents out of the possible 67, verified that they would like to focus on adults.

When the group was asked about the competitive level (see figure 24), a largest group of respondents (58) verified, that they would like to focus, at least, on talent development. Second highest endorsement had talent identification and development, with 42 votes. Recreational hockey gathered the lowest amount of votes (22).

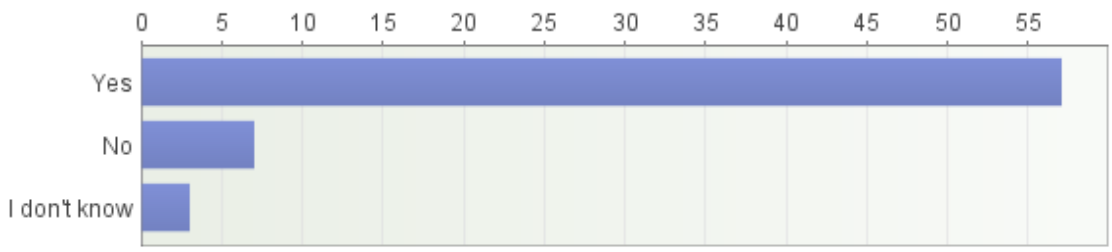

Figure 25. Should the PDG feature information on step by step skill development? (n=67)

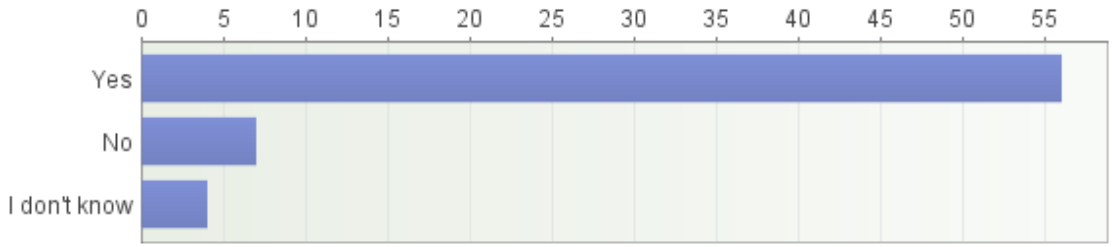

Figure 26. Would it be important that basic movement and sport-specific movement skills are featured in the PDG? (n=67)

When the respondents were asked, if they feel that the PDG should feature information on step by step skill development, a great majority of the group was choosing yes as their answer (see figure 25). As well as, in the following question about the importance of including information on basic movement and sport-specific skill in the PDG (figure 26).

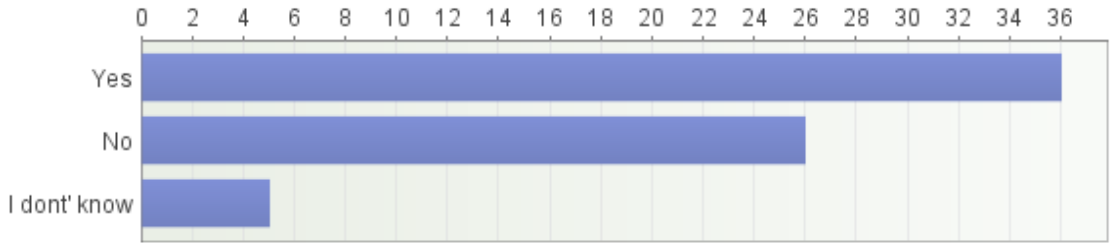

Figure 27. Are you regularly organizing Fun Hockey Days, Free Hockey Days or other events to recruit new players? (n=67)

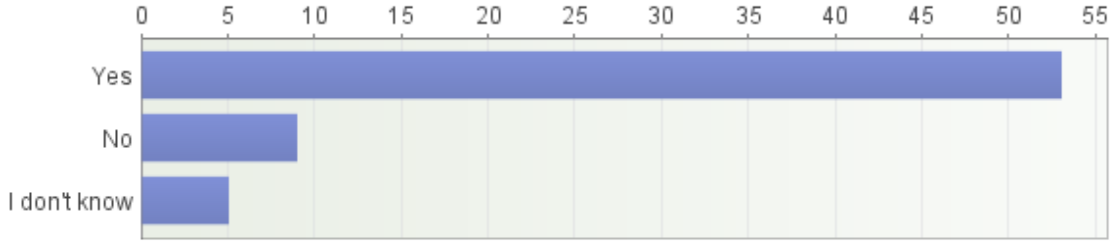

Figure 28. Do you need material on how to successfully organize such events? (n=67)

The figures 27 and 28 are closely related to each other, because the respondents were first asked, if they are regularly organizing Fun Hockey Days, Free Hockey Days or any other events to recruit new players (figure 27). After that, they were asked, if they need material on how to successfully organize such events (figure 28).

When they were asked, if they are regularly organizing such recruit events (figure 27), 36 out of the 67 respondents answered yes, whereas 26 answered no. Five individuals gave an answer that they don't know. The "I don't know" answers may be explained with the fact, that it was not explained in the question, what does it mean to be "regularly" organizing these events.

When the group was asked, if they need material on how to successfully organize those events, 53 respondents expressed their need. Only nine answered no and five that they don't know (figure 28).

As a conclusion: there would be a need for such an information, because relatively low amount of respondents (36) stated that they are regularly organizing recruit events, but on the contrary, a high number of respondents (53) verified that they would need information related on the specific topic.

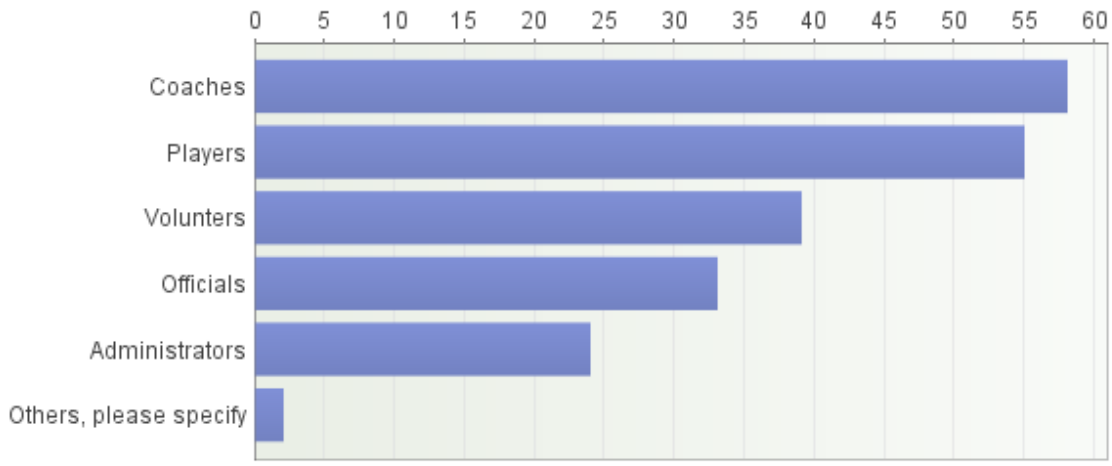

Figure 29. What areas do you require recruitment information for? Check all that apply. (n=67)

The figure 29 is still focusing on to the recruitment information needs of the respondents. They were asked, in which specific areas (coaches, players, volunteers etc.) they would require recruitment information for. They were provided with five possibilities and, again, with an open field. The largest amount of votes was gathered clearly by the areas of coaches, 58 votes, and players, 55 votes.

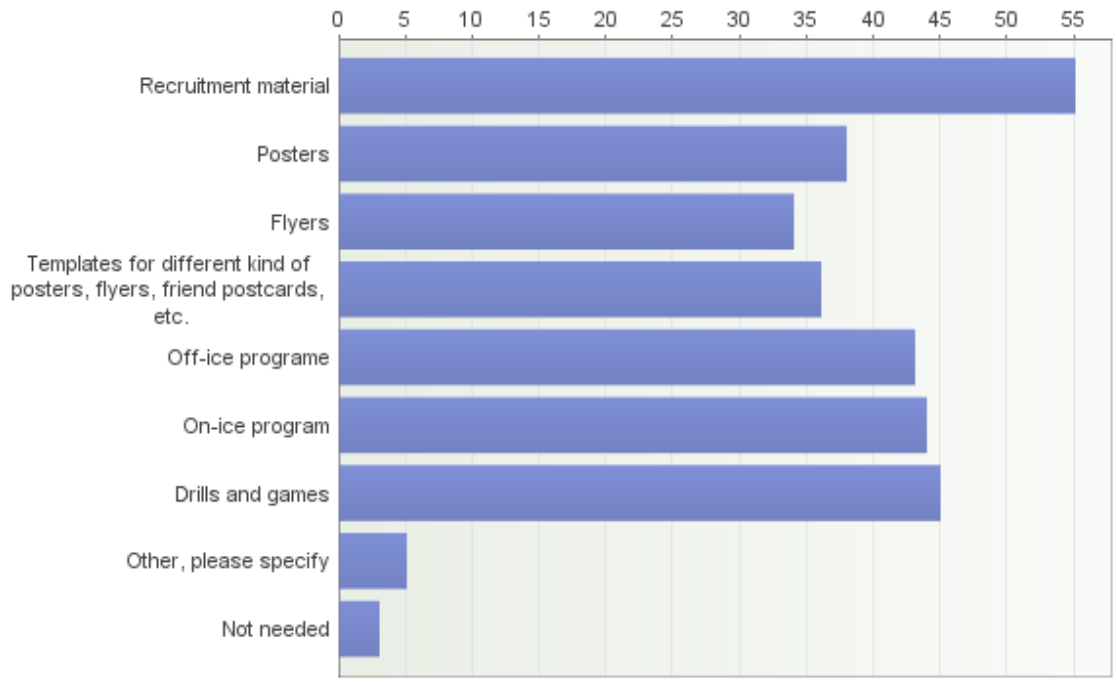

Figure 30. Do you need the following materials for player recruitment? Check all that apply (n=67)

The figure 30 illustrates how did the respondent group answered, when they were asked, if they need material for player recruitment in different sections of the recruitment process. Respondents were again asked to check all points that apply. Each one of the seven possibilities that were provided for the respondents, gathered more than 50% of the possible votes. The biggest need seems to be for recruitment material generally (55 votes) and the smallest need for flyers (34 votes).

5.3 Benchmarking process

The second stage of the study is the benchmarking process between the International Ice Hockey Federation, IIHF, and Fèdèration Internationale de Football Association, FIFA. The process will be executed by following a typical benchmarking process. However, normally a typical benchmarking process consists of five different stages (planning, analysis, integration, action, and maturity), but this research covers only the first two stages: planning and analysis. That is the case, because this research does not include the actual planning, writing and implementation processes of the IIHF Player Development Guide. As discussed earlier in chapter 4 (Purpose and methodology of the research), the purpose of this study is to clarify, by using a benchmarking concept and a quantitative survey, the need for an international coaching tool, as well as provide suggestions for the content of the tool.

Firstly, the study will offer some overall information about the IIHF as an organisation, and later proceed the stages of planning and analysis step by step.

Planning stage of this benchmarking process includes:

1. Identification of the benchmarking topic
2. Selection of the benchmarking partner
3. Selection of the product from benchmarking partner, that is going to be benchmarked

Analysis stage of this benchmarking process consists of:

1. Introduction of the current situation in the IIHF (concerning the player development material)
2. Introduction of the FIFA as an organisation
3. Analysis of the product from the benchmarking partner
4. Comparison between the products of the organisations.

The actual suggestions for the IIHF are given later in the chapter 6.

5.3.1 International Ice Hockey Federation

The IIHF was founded on May 15, 1908 in Paris, France. The IIHF is a global governing body of 76 member National Associations in Ice Hockey and Inline Hockey for both men and women. The IIHF carries responsibilities such as international promotion of the hockey, control of the international rulebook, process of international player transfers,

officiating guidelines and organizing IIHF World Championships at all levels for men, women and juniors. (International Ice Hockey Federation 2017.)

5.3.2 Objectives, Mission Statement and Vision of the IIHF

The current IIHF Statues and Bylaws, which is the written end result of the decisions taken by the annual Congress 2014 in Minsk, offers a broad understanding to the IIHF as an organization. In the very beginning it specifies the objectives of the organization. One objective, that is segregated from the others and may be seen as a main objective of the IIHF, is the promise of worldwide dedication to both growth and development of ice hockey and inline hockey. (International Ice Hockey Federation 2014, 2.)

The IIHF Statute 2 defines a great number of objectives for the IIHF. It also specifies the matters in which the IIHF is going to proceed all necessary measures to attain them.

> The objectives of the IIHF are:
>
> - to legislate for and govern the activities and operations of the IIHF in compliance with good governance principles.
> - to govern, develop and promote ice hockey and inline hockey throughout the world;
> - to develop and control international ice hockey and inline hockey;
> - to promote friendly relations among the Member National Associations;
> - to operate in an organized manner for the good order of the sport;
> - to maintain the integrity of the sport in relation to international competition;
> - to organize and control international competition; and
> - to promote and actively participate in the fight against the use of Doping and Competition Manipulation in ice hockey and inline hockey.
>
> The IIHF will take all necessary measures to attain the following:
>
> - to comply with Swiss law as it applies to the status of the IIHF;
> - to conduct its activities in accordance with the best good governance practices and its Statutes, Bylaws and Regulation/Codes;
> - to arrange sponsorships, media, license rights, advertising and merchandising in connection with all IIHF competitions;
> - to establish and maintain clear jurisdiction over ice hockey and inline hockey internationally;
> - to establish uniform international regulations and official playing rules;
> - to support the development of young players;
> - to support the development of coaches and game officials;
> - to organize all events and competitions of the IIHF;
> - to control international transfer of players;
> - to establish and maintain contacts with other sports federations and organizations;
> - to plan, implement, evaluate and monitor information and education programs for drug-free sport;
> - to support the development of the new ice hockey rinks and the improvement of existing ice hockey facilities;
> - to develop, educate, and emphasize sport's role in promoting environmental consciousness and sustainability; and
> - to implement appropriate policies in relation to IIHF Member National Associations regarding sexual harassment, equal opportunity, health, safety and such other matters as arise from time to time as issues to be addressed in hockey or inline hockey;
> - to deal with social responsibility in connection with IIHF and its activities.

(International Ice Hockey Federation 2014, 11-12.)

The mission statement of the IIHF is very narrow and it consists of the things, that are already listed in the Statute 2. The mission statement has some differences to Statute 2 in diction of the objectives, but the key message is the same. The IIHF puts great focus on the governing, developing and promoting hockey throughout the world. It promotes friendly relations among the Member National Associations and operates in an organized manner for the good order of the sport. In the mission statement the IIHF also announces, that it will take all necessary measures to aid the Member National Associations in the development of young players, coaches and game officials. (International Ice Hockey Federation 2017.)

The IIHF announces, that their vision is to compile an international library of coaching, player, administrator and officiating educational materials. This library would include books and videos which have been developed by the IIHF and its Member National Associations. The IIHF will also discuss with each county to survey their requirements and that way provide them the best assistance possible to develop the game within their own country's culture and hockey situation. (International Ice Hockey Federation 2017.)

5.3.3 The IIHF Sport Department and Development Programs

The IIHF Sport Development Program was launched 1997 and it co-operates with the member National Associations. The key objective is to develop and promote hockey globally. The intrest of the IIHF is to offer coaching, player, officiating, medical and administrator material for its member National Associations. The IIHF Sport Development Program provides National Associations recources, such as materials mentioned above, to organize and operate the educational programs in their countries. The member National Associations receive a support and assist from the IIHF, but they must organize and provide the programs by themselves. Eventually the member National Associations have also the responsibility to offer a high quality instruction, training and supervision, when organizing and executing their programs. (International Ice Hockey Federation, 2017.)

The IIHF Sport Development Program consist of five different development programs, which are the IIHF Coach Development Program, the IIHF Official's Development Program, the IIHF Junior Hockey Development Program, the IIHF Medical Development Program and the IIHF Adminstrator Program. The IIHF offers also a Learn to Play manual, it co-operates with the International Ice Hockey Centre of Excellence, located in Vierumäki, it collaborates with the Haaga-Helia, which provides Haaga-Helia Degree

Programme in Sport Coaching and Management, also located in Vierumäki, and organizes the IIHF Hockey Development Camps. All these materials and programs have a vital role in the mission of the IIHF, which is to develop and promote ice hockey worldwide. (International Ice Hockey Federation 2017.)

As mentioned earlier, the IIHF provides also Hockey Development Camps. These camps are used as a platform to start IIHF development and educational programs. The IIHF wants to assist the National Associations to specify their personal objectives, which will again help the IIHF in their mission of global growht and development of the game. The IIHF states, that the main function of the camp is not to develop individual players, but to provide the Leadership Program participants the required awareness, expertise and tools to develop players, and the game, in their countries. Recruitment and retention are emphasized in the camps and programs, because of the fact, that continous growht of ice hockey is a very high priority for the IIHF. (International Ice Hockey Federation 2017.)

The National Association Program is integrated with the program of the camp to assist the member National Associations to plan, organize and operate their domestic development programs. The IIHF uses these Hockey Development Camps to develop the partnership between the IIHF and its member Associations, educate the forthcoming ice hockey leaders worldwide, boost Fair Play and Respect, provide necessary tools to help National Associations to meet the Minimum Participation Standards of the IIHF for World Championship participation, offer academic sessions and practical experience that can help improve each member National Association, develop the skills of hockey leaders throughout the world, provide practical IIHF Development Program examples, develop networks amongst the ice hockey family to share issues and find solutions, provide personal growth and development of all the participants, and to Promote international friendships and relations. (International Ice Hockey Federation 2017.)

5.3.4 Selection of the benchmarking topic

As mentioned above, one objective of the IIHF is to develop and control international ice hockey. IIHF also states, that it will take all necessary measures to support the development of young players and coaches. IIHF as a governing body of ice hockey is not, at the moment, providing any detail specific guides for its member National associations for the development of young players or coaches. Based on those promises, made by the IIHF, and on the fact that the material IIHF is providing for its member national associations is old and partly outdated, an international player development guide was chosen as topic of this benchmarking process.

5.3.5 Selection of the benchmarking partner

The selection of the benchmarking partner was a challenging process. The whole process started with a brainstorming session. The goal was to come up with a list of possible partners, without placing any qualifying criteria at this point. The first idea was to choose the best possible example internally, inside the own field of sport, ice hockey. There would have been a couple of very good options, for example, the Long Term Player Development Model by Hockey Canada or the American Development Model by USA Hockey. However, because of the fact that Hockey Canada and USA Hockey are both National associations, whereas IIHF a global governing body of the sport, those were not seen as a best possible partners for the process. At his point the process of setting the qualifying criteria was begun. The first criterion was, that the benchmarking partner should be an international sport federation. By specifying that, the decision of using external approach for determining the partner was chosen. The best practise is going to be found from outside the sport of ice hockey, but inside the sport world.

The next step was to survey international associations in others sports. At this point the second qualifying criterion was set, the benchmarking partner needs to be an international ball sport federation. It was seen important, that the benchmarking partner is going to be found from another, globally popular, team ball sports, because otherwise the comparison and adaptation would have been too complicated. At first, the goal was to find out, if the other global governing bodies in their sports, are providing such a tool for their member National associations, and to come up with the best possible example. Following, globally popular, international ball sport federations are providing such a tool: Fédération Internationale de Volleyball (FIVB), International Basketball Federation (FIBA), International Floorball Federation (IFF), International Handball Federation (IHF), and Fèdèration Internationale de Football Association (FIFA).

FIBA and FIFA stand quite quickly out, with their guides "Coaches Manual" (FIBA) and "Youth Football" (FIFA). The other guides from the other federations were not at the same level as these two. At this point, it was already clear that one of these two, is going to act as a benchmarking partner for the IIHF. It was time for the comparison between these two. Both manuals were great examples of sport specific long-term athlete development models. There was also a great amount of topics, which were found from both manuals and the chose based only on the manual was not seen as a possibility.

At this point the chose was made, it is time to compare these two sports with another and by doing that, to be able to specify the best possible example for the PDG. Both sports,

basketball and football, are team ball sports and both are played with a ball, instead of a puck. Basketball is an inside sport, whereas football outside. The biggest differences in these two sports are, that in basketball the ball is controlled by hands and in football by feet, the number of players on the field as well as the fact that only football has a goalie, and the way to score points (basketball) and goals (football). In basketball the way to score points is to get the ball into the basket (1, 2 or 3 points), while in football the way to score goals is identical to ice hockey, the ball must cross the goal line. Rules of these to games are, of course, totally different and similarities to ice hockey are also hard to find, but that was not seen as a meaningful factor. Basketball (2.) and football (1.) are seen as a two most popular sports in the world (totalsportek.com; biggestglobalsports.com). However, when it comes to the most played sports in the world, football is found from the place 1, whereas basketball from the place 5 (pledgesports.com; realbuzz.com).

As mentioned above, the comparison between the two sports and their manuals was made. Both would have been proper partners for the IIHF in this particular benchmarking project. There was no data available about, how broadly the manuals are being used on the field among the member national associations, or the impact of the manuals on the development of young players. That led to a situation, that the best possible (external) benchmarking partner was chosen based on the following criteria: benchmarking partner has to be an international federation of a globally popular team ball sport, it should have a same kind of structure as ice hockey (way to score goals, goalie etc.) and, if possible, be the most played and popular sport in the world. Football was the sport that fulfilled all these criteria and the FIFA as the global governing body of the sport, was chosen to act as a benchmarking partner for the IIHF.

5.3.6 Current situation in the IIHF concerning player development material

In 2000 IIHF launched the Learn to Play Program, which is targeted at children, primarily between the ages of 6 and 9 years old, and at the coach/instructor education in member national associations around the world. The aim is to be able to teach the entry-level players the basic technical skills in ice hockey in a safe, fun and pleasant environment. (International Ice Hockey Federation 2010, 5-6.)

The Learn to Play Program includes Practice Manuals for four levels (A, B, C & D). Each of those four includes 20 suggested training plans to teach entry-level players the basic ice hockey skills. In each level, the first 15 plans are highly detailed and the last five less. The aim with the last five is to provide a coach/instructor a possibility to enhance his or her planning and organisational skills. The program is based on practising and playing

cross-ice. (International Ice Hockey Federation 2010, 6.) The reasoning for the IIHF Learn to Play Program to be based on cross-ice playing and practising, can be found from the LTAD –model, which recommends small-area games for teaching children how to play sports and for improving their game understanding.

Manuals are produced in 2010 and can be seen as old fashioned. All examples are provided in drawings, instead of pictures or videos, which could nowadays be easily executed. Some of the skills and explanations can be seen as outdated, but mostly the material applies still in todays' modern ice hockey. The biggest downsides are, that the manuals are concerning only the entry-level players (between the ages of 6 and 9), material is only provided for basic ice hockey skills, and that the material is almost 10 years old.

In 2003 the International Ice Hockey Centre of Excellence (IIHCE) was founded in co-operation between the Finnish Ice Hockey Association, the Sport Institute of Finland and the IIHF. The IIHCE is located in Vierumäki, Finland. The objective of the IIHCE is to develop the game of ice hockey by research and education. IIHCE is regularly providing new educational material, which composes of manuals, videos, lectures, guides, and drills. Among previously mentioned materials, the IIHCE provides hockey training camps, international conferences, seminars and tournaments. Despite the large amount of material from the IIHCE, a concrete manual, or guide, for a global player development, has not been provided. For that reason, the IIHF Learn to Play Program Practice Manuals are seen as the only player development manual, provided by the IIHF.

5.3.7 Indroduction of the benchmarking partner – Fèdèration Internationale de Football Association

FIFA was founded on May 21, 1904 in Paris, France. FIFA is a global governing body of 211 member National Associations in Football. It has performed as a pioneer among international sporting federations in different areas of sport management and development. FIFA carries responsibilities such as continuous development and promotion of the game of football, organization of FIFA's own competitions, control of regulations and provisions in football, ensuring that the game of football is achievable for everyone, promoting the development process of female football, integrity, ethics and fair play inside the sport. FIFA has nine committees, which act on the following areas: development, finance, football stakeholder, governance and review, medical, member association, organising, players' status, and referees. Each of these nine is responsible to report the FIFA Council, in its own field of function. (Fèdèration Internationale de Football Association 2018; Fèdèration Internationale de Football Association 2016, 6.)

5.3.8 Benchmarking object – FIFA's Youth Football –manual

FIFA as a global governing body in the game of football, has dedicated itself into a process of continuous development of the sport. FIFA has produced a number of different manuals and surveys such as FIFA Youth Football Survey, FIFA Coaching Manual and FIFA Youth Football –manual, which all focus on the development of the sport among its member National associations globally. In this study we will focus on the Youth Football –manual. Youth Football -manual is seen as a benchmarking object for the IIHF Player Development Guide, because of the fact that it is dedicated on the development of young players among football, similarly as the PDG by the IIHF will be within ice hockey.

FIFA Youth Football –manual consists of 12 chapter and 257 pages (see figure 31 on the following page). It can easily be said, that the foundation for the manual lays on the long-term athlete development model. Various chapters, such as technique (chapter 4), strategic approach (chapter 5), physical preparation of young players (chapter 6), the mental and educational aspects of basic training (chapter 7), and training games (chapter 8), are strongly combined to the LTAD –model.

FIFA Youth Football	Name of the chapter	Subsections	Summary
Chapter 1	Current trends in Football	• Different behavior • Individual qualities • Game systems and tactical flexibility	Provides information on the current trends in football. Discusses about zonal system, defensive game, attacking game, transition, animation and effectiveness of play, individual qualities needed in modern football, and playing systems and tactical flexibility.
Chapter 2	The player in training	• Training adapted to the stages of learning • Advice for the training of young players	Specifies the stages of learning, which are used by FIFA, and provides advice for the training of young players on the following aspects of player development: technical, tactical, athletic, and psychological and educational.
Chapter 3	The instructor	• The instructor-educator • The instructor-trainer • The instructor-coach • The instructor-confidant • The instructor's ongoing education	Explores the numerous roles of an instructor among young players as well as the different requirements on those roles. Provides tools and propositions for an instructor on various aspects of coaching.
Chapter 4	Technique	• Aspects of technique • Developing technique • How to improve technique • Technical training in the basic training stage • Technical training in the intermediate training stage	Focuses on the technique. Provides a definition for technique as well as knowledge on the different aspects of technique. Discusses about how to develop technique during the different stages of learning. Provides methods for teaching technique and examples of drills for technical training in basic and intermediate training stage.
Chapter 5	Strategic approach	• Tactics • Developing tactical understanding at basic training level • Refining tactical understanding at intermediate training level • Tactical work in cycles • Systems of play • Set-piece strategies	Dedicated for the strategic approach. Provides definition for strategic approach as well as for various sectors, which are related to the topic. Discusses about tactics in football, about switching roles, tactical evolution, and developing tactics. Provides knowledge and examples on tactical understanding on basic and intermediate training levels. Brings understanding on the principles of play and gives propositions how to teach these in cycles. Introduces the different systems of play and set-piece strategies, with details and suggestions for coaches.
Chapter 6	Physical preparation of young players	• Physical conditioning in modern football • The physical demands of modern football • Training coordination skills • Endurance training • Strength in football • Speed in football • Recovery and regeneration • Physical tests for young players	Provides understanding on physical conditioning in general and on the specific demands of modern football. Introduces the basics of endurance, strength and speed training as well as recovery and regeneration. Offers examples on training/executing all of those. Discusses about physical tests for young players and provides recommendations on what should be tested.
Chapter 7	The mental and educational aspects of basic training	• The educational potential of football • Training mental strength	Defines, based on the current trends in football, that mental strength is a key capacity for players at top level and an important part of their training. Discusses about the educational potential of football, and provides knowledge on mental strength and how to train it.
Chapter 8	Training games	• The benefits of small-sided games • Examples of training games	Discusses about training games and how they affect on the training. Provides knowledge on the benefits of small-sided games as well as various examples of small-sided games.
Chapter 9	The goalkeeper	• The young goalkeeper (6 to 12 years old) –introductory phase • The young goalkeeper (13 to 15 years old) – basic training • The young goalkeeper (16 to 18 years old) – intermediate training	Provides knowledge on the coaching and training of a goalkeeper on introductory phase, basic training level and intermediate training level. A great number of pictures and examples of drills are introduced.
Chapter 10	Planning	• Planning the training • Warming up (start) • The training mix	Discussed about planning as an important part of coaching and player development. Provides knowledge on planning the training by introducing principles of planning training, and planning periodization and annual cycles. Various drills technical training in basic training level and technical-tactical training at the intermediate training level are given. Offers also a short introduction on warming up in football and on general warm-up methods. The training mix is also covered.
Chapter 11	Youth competitions	• Structuring youth competitions • Evaluating the match	Provides an introduction on the topic and suggestion on structuring youth competitions. An example of match evaluation sheet is also provided.
Chapter 12	Football academies	• Structure and organisation of an academy • Recruitment of young talent • The various player evaluation sheets	Provides a definition for football academies and clarifies the need. Offers suggestions on structure and organisation of an academy. Discusses about talent in football and gives propositions on recruitment of young talents. An example of player evaluation sheet and another of a player's self-evaluation sheet, are provided.

Figure 31. Content of the Youth Football –manual by FIFA

5.3.9 Reasoning behind the Youth Football –manual

FIFA states that the youth training is vital for the organisation, because it is seen as a factor that will secure the strength and success of the sport in future. FIFA sees the Youth Football –manual as one part of the engagement to their member associations. By offering a worldwide, free, training framework, FIFA is able to support its member associations in the process of providing more possibilities for youth football. FIFA as a governing body of football wants to provide a manual, which will not only improve professional structures and offer guidance for youth football coaches among its member associations, but also allow those to determine realistic objectives and suitable training as well as competition structures for their youth football programs. (Youth Football, 3-6.)

5.3.10 Content of the Youth Football –manual

Youth Football –manual, provided by the FIFA, is an international coaching tool, which concentrates on elite youth training. It composes of 12 individual chapters, which all deal with the different factors in that particular process. (Youth Football, 6-7.)

FIFA has used analyses, that are made of the late international competitions, to expose and specify the current trends in the game of football. Chapter 1 in the manual considers these studies. FIFA defines, that the findings of those analyses represent the outcome of training and gives them an opportunity to formulate the future. Chapter has three subsections: different types of behaviour, individual qualities, and playing systems and tactical flexibility. Different types of behaviour, provides knowledge on the current trends in zonal system, defensive game, attacking game, transition, and animation and effectiveness of play. Individual qualities, discusses how the individual qualities of a player or a goalkeeper effect the matches and the results at all levels. It provides information on effective attacking play, compact defensive lines, and qualities of goalkeepers. Playing systems and tactical flexibility, discusses about different playing systems on a modern football. It defines how good teams are able to stay tactically flexible and how their game is intelligent. (Youth Football, 8-17.)

The analyses of existing trends in elite youth football has proven that it is essential to pay attention to psychological aspects in order to achieve the elite level of the sport. Same analyses have also specified, that the basic training of the sport itself, must not be underestimated or neglected. Nowadays sport plays a big education role in the process of developing young athletes. FIFA clarifies that training of sport, should not be focusing only on the development of skills that are vital in the particular game itself, but also on improvement of personal and social skills. Chapter 2 in the Youth Football –manual, specifies the

four different stages of learning (used by FIFA), which are introduction (age 6 to 12), basic training (age 13 to 15), intermediate training (age 16 to 18), and advanced training (age 19 to 21) as well as discusses on the importance of the learning objectives. Chapter provides advice for the training of young players on the following aspects of player development: technical aspects, tactical aspects, athletic aspects, and psychological and educational aspects. Those are composed of the observations, made by the Technical Study Groups at various FIFA U17 and U20 World Cups. (Youth Football, 18-29.)

An instructor in the game of football, has several different roles and requirements. One has to be able to fulfil these requirements, in terms of being able to provide young athletes all-round training as well as the possibility to be prepared for the sport in future. An instructor among youth football is a trainer, an educator, a coach and a person of trust. Chapter 3 of the manual explores these numerous roles as well as their requirements. The understanding of the different roles and their requirements, are vital for an instructor in the process of developing young players. Chapter provides hands-on tools and propositions for an instructor, on the following aspects: methodology of training, feedback, main educational methods, repetition as a fundamental principle of learning, educational approach of the global-analytical-global method, and match coaching. It discusses, for example, how an instructor should know the character of his or her young athletes, because only by doing so, one is able to create a confidential relationship with a young player. A confidential relationship between an instructor and a player is vital for the development process of personalities and psychological skills of young athletes. These skills will be needed on the way to the highest level of the sport. (Youth Football, 32-43.)

Chapter 4 focuses totally on technique and consists of following subsections: aspects of technique, developing technique, how to improve technique, technical training in the basic training stage, and technical training in the intermediate training stage. Beginning of the chapter provides a definition for technique. It describes technique as a factor which generates the content of the sport as well as leads all the tactical objectives needed for a team to perform well together. It is also defined, that good coordinative skills are required for being able to reach good technical abilities. (Youth Football, 46.)

After providing general definition for technique, chapter 4 moves to the first subsection: Aspects of technique. It describes how the basic techniques are the foundation for both, attacking and defensive techniques. It states that a player should practise the basic techniques before, or at the beginning, of each individual training session. Chapter provides concrete drills for the development of the basic techniques, more precisely, for controlling the ball on the ground, in the air, return of the ball in the air to the ground, ball arriving on

the ground, and ball arriving in the air. It provides definition for attacking techniques as well as explains, which techniques are seen as attacking movements or individual attacking techniques. A definition for defensive techniques is also given together with factors that may effect defender's behaviour during the game and techniques that are defensive movements or individual defensive techniques. At the end of the first subsection, is explained that a 1-on-1 situation is one of the most often occurring situation during a game. 1-on-1 situation is always a duel between attacking and defensive techniques. (Youth Football, 47-51.)

The second subsection of chapter 4, Developing technique, starts with a statement, that the ability to control and use the ball creates the base for technique development. It defines that the work on technique should be one of the main priorities in training. This subsection provides basic information and understanding on technique in basic training, technique in intermediate training and technique in the advanced training level. At the end of the subsection is provided concrete tools and examples for the individual development within group training, in a separate session or in a specific individualised session. Also an example of a specific 60 minutes training session is given. (Youth Football, 52-54.)

The third subsection in chapter 4, how to improve technique, provides different methods for teaching technique. It discusses about the importance of repetitions and proper demonstration, balance between the quantity and the quality, execution, correcting and encouraging, confident player and how challenges should be set and "homework" given. (Youth Football, 58-67.)

The last two subsections concentrate on giving specific drills for the technical training in both basic and intermediate training stage. The part of technical training in the basic training stage, includes eight different drills or games for improving passing and control and four for each of the following: shooting, shooting at the goal after a pass, shooting at the goal from a cross, 1-on-1 situations with a goalkeeper, 1-on-1 duels, four for headers as well as basic practice games. The part of technical training in the intermediate training stage, in turn, provides four examples for each of the following: varied games on a medium-sized pitch, game formats with numerical advantage to improve possession play, finishing on small pitches, exercises and game formats, and cognitive games. (Youth Football, 68-73.)

Chapter 5 is dedicated for the strategic approach. As previous chapters, chapter 5 stars with the definition on the topic and thereafter delves into the several subsections. These subsections are: tactics, developing tactical understanding at the basic training level, refining tactical understanding at the intermediate training level, tactical work in cycles, system of play, and set-piece strategies. (Youth Football, 74-77)

Tactics, first of the subsections in chapter 5, begins with a short paragraph, which provides general information on the topic. This paragraph is followed by ones for switching roles, tactical evolution and developing tactics. The subsection ends with a paragraph, that tactics start in 1-on-1. It is stated that free play offers players the freedom to improve their creativity and for that reason it should be included in training sessions. (Youth Football, 78-79.)

The second subsection, developing tactical understanding at the basic training level, starts with a determination of the tactical problems, which the young footballers possess at the start of the basic training cycle. Later focus is set on the developing of tactical qualities. This subsection provides really useful hands-on tools and tips, for the development process of tactical qualities among young football players. (Youth Football 80-81)

The next subsection, refining tactical understanding at the intermediate training level, describes, that the intermediate training level, is the final stage of the player development. The goal during this stage is to be able to finish the development of players' physical and technical capability as well as to adjust their tactical understanding and awareness. The main idea in this section is that, players should be technically well educated by the time they reach the intermediate training level. The good work that has been done, can now be utilized as a core for more detailed individual and team tactics. The subsection is included with a great amount of concrete tips and pictures on the tactical details of defensive and attacking plays. (Youth Football, 83-99.)

Tactical work in cycles, fourth of the subsections in chapter 5, provides understanding on the topic of teaching general principles of the game. It is defined, that the process of teaching those principles takes time and can't be thought simultaneously. Working in cycles is suggested. This subsection includes three cycle examples, that coaches may use in their everyday work with young players. (Youth Football, 100-103.)

The last two subsections in chapter 5, focus on the systems and strategies in the game of football. The first one, systems of play, includes several different examples of systems that may be used in a game. Each one is introduced with a picture and text description.

The second one, set-piece strategies, does the same for the different set-piece situations. It discusses, for example, should a team choose a man-to-man or zonal marking at corner kicks, and on what the individual players should focus on in these situations. Again very useful hands-on tools for coaches among young players. (Youth Football, 104-113.)

Chapter 6 deals with the physical preparation of young players. It starts again with a short introduction on the topic before moving on to the subsections. The eight subsections in chapter 6 are: physical conditioning in modern football, the physical demands of modern football, training coordination skills, endurance training, strength in football, speed in football, recovery and regeneration, and physical tests for young players. Each one provides research based knowledge on the specific topic as well as suggestions for a coach. The knowledge provided in Chapter 6 is partly football specific, but the great amount of general long-term athlete development information, can easily be exploited in other sports as well. (Youth Football, 118-161)

Chapter 7 is dedicated for the mental and educational aspects of the basic training. Mental strength is seen as one of the key factors in todays' high level football and it should be also a prominent part of a daily training. Chapter 7 includes two subsections: the educational potential of football, and training mental strength. It discusses, for example, how football as a sport, provides education potential on fair play and performance, and what are the various factors of mental strength. Chapter 7 defines, that it is common for young talented athletes to possess deficiency in the mental factors, but also that those can be improved by regular and continuous training. However, it is mentioned, that certain aspects cannot easily be improved by training (aggressiveness for instance). The last part of the chapter provides again very good examples, to be used in the process of developing the mental aspects in various game scenarios. (Youth Football, 162-173.)

Chapter 8 is about training games. Training games are a great tool to develop the competitiveness inside a training session as well as to make the session more fun and intensive. This chapter includes two parts. First part discusses about the benefits of small-sided games and the second one provides examples of training games. (Youth Football, 174-183.)

Chapter 9 is targeted for training a goalkeeper. This chapter consists of three different stages: introductory phase, basic training, and intermediate training. It offers understanding in the coaching work among goalkeepers on all those three stages. Principles of the goalkeeping and its' different techniques, are introduced with photos and explanations. As an addition for those, chapter 9 provides very useful drill examples, that may be used by

any coach who is working together with young goalkeepers. It serves also information on the physical, psychological and tactical preparation of a goalkeeper. (Youth Football, 184-209)

Chapter 10 is about planning and it includes three parts, which are: planning the training, warm-up (start), and the training mix. General information about planning and its' importance is provided. The first part, planning the training, concentrates on to principles of planning training sessions and to periodization as well as annual cycles. A great amount of information is provided in writing and many examples of periodization and planning on charts. One example of a technical training session in basic training stage and one technical-tactical at the intermediate training stage is presented.

Second subsection, warm-up (start), provides general information on objectives of warm-up and on warm-up methods. Also an example on pre-match warm-up is introduced. Last of the three parts in chapter 10, the training mix, is about the key elements on the training process to avoid over-training. General information on each key element is provided. (Youth Football, 210-235.)

Chapter 11, youth competitions, discusses about the structuring youth competitions, and introduces an evaluation tool for coaches to be used in match analysis. FIFA with its' member associations as well as confederations possess a great responsibility in the process of structuring youth competitions. Chapter provides knowledge on the main principles of structuring these competitions, and on the process of match and player evaluation. (Youth Football, 236-241.)

Chapter about football academies, which is also the last of the 12 chapters in the youth football –manual, provides general information on the topic itself as well as on the objectives which any academy in the game of football should have. It recapitulates guidelines and propositions for structure and organization of an academy, and recruitment of young talents. It discusses, for instance, about the goals, objectives, programmes, staff structure, welcome centre, school, young trainees and training conditions, of these academies. Chapter provides also one example of a player evaluation sheet for a coach as well as one example of a player's self-evaluation sheet. (Youth Football, 242-255.)

5.3.11 Comparison of the player development guides from IIHF and FIFA

As discussed earlier, the Practice Manuals of the IIHF Learn to Play Program and the Youth Football –manual from the FIFA, are seen as player development guides, that these two global governing bodies in their sports are providing for their national member associations. Manuals from both organisations are aiming for the better development of young players, which has a major impact on the development of sports.

The Long-Term Athlete Development Model (LTAD –model) can be seen as a foundation for the manuals from IIHF and FIFA. In the introduction of the Practice Manuals from IIHF, is clearly stated that ice hockey at the age of 6 to 9, should be based on having fun and everybody should be allowed to participate. Those two values are the cornerstones at the FUNdamental stage of the LTAD –model. The introduction verifies as well, that the whole IIHF Learn to Play Program is based on cross-ice playing and practising, which is also recommended by the LTAD –model, because of the positive impact that it has on teaching children to play sports and on their development on game understanding.

Youth Football –manual clarifies in the introduction, that the manual has a view of a long-term concept for youth training. The manual introduces four stages of learning, which are: Introductory stage U12, Basic training U16, Intermediate training U19 and Advanced training U21. In the LTAD –model the different stages, and moving from stage to another, are rather based on the development of an individual than on the chronological age, but rough guidelines are given. These four stages in LTAD –model are: Learn to Train U12, Train to Train U16, Train to Compete U18, and Train to Win U21. Also the learning objectives by the Youth Football –manual, for those four stages, are highly similar to the ones, provided by LTAD –model. During the Introductory stage (age 6 to 12), children are introduced to the sport. Participation should provide enjoyment and general sport skills should be learned before moving to the next level. As the both, LTAD –model and Youth Football –manual, clarify, at the basic training level (age 13 to 15) young players should be able to strengthen, sophisticate and develop basic skills in their sport. Decision-making skills keep on improving, as well as, speed, strength, endurance, and flexibility qualities. A great value should be set in building a strong aerobic base, improving speed and strength qualities, and to further improve sport-specific technical and tactical skills. Because of the maturation level, mental aspects such as concentration and self-confidence should be trained. At the Intermediate training stage (age 16 to 18), players should be able to improve and maintain their physical capacities, and to improve their technical, tactical, and playing skills, in order to improve their performance.

The actual comparison of these two products, Practice Manuals by IIHF and Youth Football –manual by FIFA, is quite short. The similarities are, as mentioned above, that both share the same objective, which is to develop the level of young players by providing material on player development, and that both are based on the Long-Term Athlete Development –model. However, the fact is that the Practice Manuals from the IIHF are very old fashioned and providing only material for teaching the basic skills of ice hockey between the ages of 6 to 9, whereas the Youth Football –manual is quite opposite. It is up-to-date, and providing study based material on a broad scale concerning the development of young football players. It covers all the different development stages during the childhood and youth as well as provides both, general information on the maturation process of a young player, and sport specific information, drills and examples.

As a conclusion, the Practice Manuals of the IIHF Learn to Play Program are aimed for the coaches, instructors and players on the grass root level, in the smaller member national associations. The Youth Football –manual, instead, is a player development framework, which provides a great amount of knowledge, hand-on tools and understanding on coaching in football. Youth Football –manual is a proper tool for coaches without any background among football and for the ones with several years of experience.

6 Results and suggestions for the IIHF

The objective of this chapter is to provide reasoning for the IIHF Player Development Guide as well as a concrete suggestion for the content of the guide. The reasoning and the content suggestion, are based on the findings from the PDG Survey and the benchmarking process between IIHF and FIFA.

First, the results of the PDG Survey and the benchmarking process are introduced. Those will be followed by the reasoning for the IIHF PDG, based on the results, and as an end product, a suggestion for the table of content of the IIHF PDG is provided.

6.1 Results of the PDG Survey

PDG Survey provided a great amount of important information, from the people acting in the national member associations, which the IIHF as a global governing body in the game of ice hockey, should definitely utilize in their process of improving the sport worldwide.

The group of 67 respondents from a various different positions within ice hockey, all from the national member associations, stated clearly, not only, that there is a major need for such a framework as the IIHF Player Development Guide, but also that it should be mandated by the member associations. The great majority of the group stated that their national association would use such material and it would be either very important or important for them, in the process of developing young players and the sport in general. There was a mutual understanding within the group, that PDG would help the respondents in their current position as well as to guide both players and coaches. PDG was also seen as an important tool, that will help coaches to prepare better training sessions, which again is an important factor in the long-term player development.

The results of the PDG Survey pointed out that the needs for the content of the guide are extremely broad. Respondents expressed, for example, that they have needs for the PDG on what and how they should coach at certain player development stage, how they should coach a player who is lacking basic fundamental skills, and for standardizing coaching objectives and methodology within an association, region and community. They also stated, that they would be eager to find material in the PDG on teaching of skills, on- and off-ice drills, skills and drill progression, developmental stage appropriate drills and skills, individual and team tactics, technical skills, practice planning, activity tracking tool, material for parents, communication, and goaltending. The majority of the respondents notified that they would need information on development of speed, stamina, strength, endurance, flexibility, and mobility as well as on proper nutrition, recovery, and rest. Information on

emotional, cognitive, physiological growth, communication, and social skills of players were requested as well as guidelines and knowledge on step by step skill development and both basic movement and sport-specific movement skills.

Results point out, that the respondents wish the PDG to focus on providing information on the development of sport among children and adolescent. Another factor that came up, was that the respondents would like to focus rather more on competitive levels within sports as on recreational ice hockey.

Only approximately half (53.8%) of the respondent group stated, that they are regularly organizing some kind of recruiting events to acquire new players. However, majority (79.1%) stated that they would need material on the process of organizing such events. What was not asked in the survey is, if they are organizing events on recruiting new coaches, volunteers, officials or other personnel. Results define that the biggest need for recruitment information is on the recruitment of coaches and players. It can also be stated, that the need for material is, again, extremely broad. Respondents verified, that they would need material on recruitment, posters, flyers, templates, on- and off-ice program, drills and games, social media and budget.

6.2 Results of the benchmarking process

The benchmarking process between the two international federations, IIHF and FIFA, provided a plenty of important knowledge for the researcher, on the process of providing reasoning for the IIHF PDG as well as the suggestion for the table of content. Firstly, it clarified that the material provided by the IIHF, for the development of young ice hockey players, is not at the level of the material provided by the FIFA. The existing manuals by the IIHF, are old and extremely narrow on the knowledge that is provided. They are aimed only on the development of entry-level players at the age of 6 to 9, and any research based knowledge on the long-term player development, excluding basic ice hockey skills, are not provided. FIFA, however, is providing a player development framework for its member national associations, which covers the long-term development of young football players extensively. The Youth Football –manual by the FIFA, is a great combination of general, research based, knowledge on the development stages of young players, and a football specific, information and examples on teaching techniques, tactics and formations of the game.

As a conclusion, at the moment FIFA, as a global governing body of football, is providing a great tool for its member national associations, for the process of long-term development of young players. The material provided by the IIHF instead, is, at the moment, not on the level that it should be, if we consider that we are talking about a global governing body of ice hockey, which has also given a promise of taking all the necessary measures to support the development of young players and coaches. The suggestion for the content of the IIHF PDG, will be strongly influenced by the Youth Football –manual, provided by the FIFA.

6.3 Reasoning for the IIHF Player Development Guide

As the analysis and results of the PDG Survey clearly define, there is a great need and demand for such a framework as the IIHF Player Development Guide. IIHF as a global governing body of ice hockey, has the responsibility to provide a solution for this existing need, within its member national associations. By implementing the Player Development Guide, IIHF is not only providing a tool for the current need on the field of ice hockey, but also executing and fulfilling organisation's own objectives. As mentioned earlier (Chapter 5.5.2 Objectives, Mission Statement and Vision of the IIHF), IIHF has defined the development and promotion of ice hockey globally as one of its' main objectives. IIHF has also promised to take all the necessary measures to support the development of young players and coaches. By executing the Player Development Guide, IIHF would take one big step in the process on fulfilling those objectives and promises.

As discussed earlier (see chapter 3.1 The Long-Term Athlete Development –model), the LTAD –model was first introduced, because the need for improvement in the quality of the sport and physical activity was recognized. The aim of the LTAD framework was, and still is, to solve the many deficiencies and following consequences that disturb the present system and to offer positive experiences for participants at all levels. By assimilating the last two sentences, one is able to understand, that those are reasons and arguments, why IIHF, as an international association of ice hockey, should be producing their version of the framework. The demand for a player education tool, provided by the IIHF exists.

The benchmarking process clarified, that many of the international federations, in other globally popular ball sports, are providing player development manuals for their member national associations. Manuals that are provided by, for instance, FIFA and FIBA are such tools, that those will sure have a positive impact on the development of football and basketball worldwide. IIHF as an international federation for ice hockey, should join FIFA and

FIBA, and provide a concrete player development framework, which would help member national associations in their work on the development of young players and the sport.

6.4 Suggestions for the content of the IIHF Player Development Guide

The main objective of this research was, together with the reasoning for the guide, to provide a concrete suggestion for the content of the IIHF Player Development Guide. On the following page the suggestion for the table of content of the IIHF Player Development Guide is introduced. It is based on the results from the PDG Survey and the benchmarking process between the two global governing bodies, IIHF and FIFA.

As we see in figure 32, on the following page, the suggestion is, that the IIHF Player Development Guide, would compose of 12 Chapters. The layout of the provided table of content, is strongly based on the Youth Football –manual. As introduced earlier, the Youth Football –manual consists of 12 chapters. However, in the proposal for the IIHF, chapter 4 (Training games) of the Youth Football –manual, is included in chapter 5 (Tactical approach) and chapter 12 (Football academies), is excluded. Chapter 12 is not covered, because unlike in football, academies are not popular in ice hockey, and based on that, the need for such material was seen irrelevant. Chapters 7 (Proper nutrition of young ice hockey players) and 12 (Role of the parents in youth ice hockey) are provided, because the need stand out in the results of the PDG Survey.

IIHF Player Development Guide	Description of the Chapter	Content
Introduction		Clarifies: • Reasoning behind the IIHF PDG • Vision and objectives of the guide • Content of the guide
Chapter 1	Current trends in Ice Hockey / Modern Ice Hockey	Provides knowledge on the current technical and tactical trends in ice hockey. Discusses about, how has the ice hockey as a game developed during the past few years, and what are the current trends in the game (Individual qualities and team tactics). Should be based on the latest Olympic Games, IIHF World Championships and U20 World Championships.
Chapter 2	Developmental stages during the childhood and youth	Introduces the four developmental stages during the childhood and youth (FUNdamentals, Learn to Train, Train to Train and Train to Compete). Provides study based facts on the maturation process of player and defines the coaching objectives for all of the stages. Covers following key factors of long-term player development: physical literacy, specialization, and excellence takes time.
Chapter 3	The Coach	Provides understanding on the various roles of a coach among young ice hockey players. Discusses about the demands and factors that must be taken into a consideration, while interacting with players at different developmental stages.
Chapter 4	Skills in ice hockey	Provides, study based, knowledge on teaching and learning processes of skills in general. Covers the current ice hockey skills in skating, stick handling, passing, and shooting as well as divides those skills on the different developmental stages (skill progression). Serves proper execution techniques on those skills in video format, and provides an example of well organized skill training sessions on each skills entirety on each developmental stage.
Chapter 5	Tactical approach	Provides knowledge on individual and team tactics in ice hockey as well as proposal for developmental stage appropriate execution of the two topics. Introduces the, study based, arguments of small-area games in the process of developing the tactical awareness of young players as well as various examples of small-area games.
Chapter 6	Physical training of young ice hockey players	Discusses about the physical demands in modern ice hockey. Introduces the, study based, facts of training the different physical qualities such as speed, endurance, strength and suppleness as well as provides developmental stage appropriate knowledge and examples on training of those qualities. Provides, study based, information on trainability and age as key factors of long-term player development. Covers the recovery and regeneration by providing general information on the topics and by offering an example of regeneration type of training in the sport. Discusses about the physical testing for young players in ice hockey and provides developmental stage appropriate examples for testing.
Chapter 7	Proper nutrition of young ice hockey player	Discusses about the importance of proper nutrition and provides, study based, knowledge on the topic among young ice hockey players. Introduces examples of proper meal plans for all the developmental stages as well as a tool for tracking the nutrition of young players.
Chapter 8	Mental and educational aspects of ice hockey	Discusses about the educational potential in ice hockey as a sport – what are the values that can and should be learned while performing in the sport, and how can they be transferred on other factors in life. Provides information on intellectual, emotional, cognitive, and moral development of a young player as well as on how to develop communication and social skills.
Chapter 9	The goalkeeper	Introduces the technical, tactical and physical demands of modern goalkeepers and provides knowledge and material on the coaching of goalkeepers at the different developmental stage. Covers the basic techniques as well as individual tactics. Discusses about the psychological demands of young goalkeepers and provides know-how on the coaching the topic itself.
Chapter 10	Planning	Discusses about the importance of planning in ice hockey. Introduces the concept of periodization and provides understanding on, how to use it at the different developmental stages.
Chapter 11	Competition in youth ice hockey	Discusses about the competition in youth ice hockey at the different developmental stages. Provides understanding on the importance of long-term development versus short-term achievements in competitions.
Chapter 12	Role of the parents in youth ice hockey	Discusses about the role of parents in youth ice hockey. Provides knowledge and tools that a coach may use, when communicating and interacting with parents.

Figure 32. Suggestion for content of the IIHF Player Development Guide

Based on the PDG survey, the guide should mainly focus on the competitive levels of ice hockey among children and adolescents. However, it is strongly suggested by the researcher, that the guide should be based on the long-term player development model. That is justified by the fact, that the LTAD –model covers all the various factors concerning the development of children and youth in any sport. In the long-term player development model, the line between recreational and competitive sport, within the late specialization sports such as ice hockey, for children is not recognized. As suggested, chapter 2 in the guide, should introduce the four developmental stages during the childhood and youth. On the first stage, FUNdamentals, all activities should be based on having fun and enjoyment. Also the possibility to participate should be guaranteed for all. The learning objectives of FUNdamentals stage and the second developmental stage, learn to train, are mostly on the learning of fundamental movement skills, basic ice hockey skills, and game understanding. Based on those facts, it is suggested, that material which is provided for these two developmental stages, would not be introduced as a material for competitive ice hockey, but as a material that applies for all, despite the current skills of a player. Material for the train to train and train to compete, can be directed on the competitive side of the sport.

In order to fulfill the objective of the guide, which was to provide a comprehensive long-term player development pathway for the member national associations of the IIHF, and the need that was indicated by the results of the PDG Survey and the benchmarking process, the content of the guide must be broad. As the results of the PDG Survey clarified, the need on the field for the following material was pointed out: teaching of skills and skill development, on- and off-ice drills, skills and drill progression, developmental stage appropriate drills and skills, basic movement and sport-specific movement skills, individual and team tactics, technical skills , practice planning, parents, proper nutrition, recovery, rest, development of speed, stamina, strength, endurance, flexibility and mobility, emotional, cognitive and psychological development, communication and social skills. As we may see in figure 32 and in the description of the content suggestion for the guide, on the following pages, the proposal covers all the desired topics.

The PDG Survey pointed also out, that a need for material concerning the recruitment of coaches, players, volunteer, officials and administrators exists. However, based on the benchmarking process, that kind of material was not seen as relevant for a guide that is aiming on the long-term development of young ice hockey players, and for that reason it is excluded from the proposal. Suggestion for the IIHF is to provide a separate framework on the topic.

In the following paragraphs the suggestion for the content of the IIHF PDG is introduced in details. Guide is suggested to start with an introduction, which provides the reader information on the reasoning behind the IIHF Player Development Guide, vision and objectives of the guide, and a description of the content of the guide.

Chapter 1, in the proposal, is aiming to provide the latest trends in modern ice hockey. Those trends should be based on the findings from the latest Olympic Games and IIHF World Championships on both genders as well as on U20 World Championships in men. Those, previously mentioned, competitions are providing each year a proper general view on the current trends within the sport. Chapter covers the technical and tactical aspects of today's ice hockey. Findings, that are provided in chapter one, are going to act as a foundation throughout the guide.

Chapter 2 covers the developmental stages of player during childhood and youth. Chapter introduces the four stages, FUNdamentals (U8), Learn to Train (U12), Train to Train (U16) and Train to Compete (U20) as well as discusses about the learning objectives on each stage. Chapter is strongly based on, the study based, facts of the long-term athlete development model. It provides understanding on the key factors of the model as well as on the stage specific details that must be considered in training process of a young player.

Chapter 3 discusses about the responsibilities, demands, skills and requirements of a coach in a development process of young players. It provides knowledge on the various roles of a coach. Those roles are, for instance, educator, trainer, coach, and confidant. The fact is, that a coach who is working among young ice hockey players, is not only responsible for the results or technical development of his players. One is a person of trust, who has an important role in the development process of the mental features of young players. Chapter attempts to provide understanding on coaching, not only as an ice hockey specific framework, but as a framework, which is supporting the maturation process of a young person in general.

Chapter 4 is dedicated for skills. It provides, study based, knowledge on skill learning and development. It introduces the facts, of the long-term athlete development model, concerning the window of accelerated adaptation for skill learning. It provides understanding on the topic on each of the four developmental stages. Chapter introduces the modern techniques on skating, stick handling, passing and shooting as well as a proposition for developmental stage appropriate skill progression. It discusses about the importance of good technical skills in modern ice hockey. At the end, chapter provides an example of

well planned and organized, developmental stage appropriate skill training session on each of the four skills.

Chapter 5 covers the tactical approach in ice hockey. It is strongly based on the findings from the latest Olympic Games and World Championship on both genders as well as U20 World Championship in men. Findings that were already introduced in chapter 1. Chapter discusses about the tactical approach on each of the four developmental stages. It provides knowledge on the topic in the concept of long-term player development. That is seen as an important aspect, because tactical approach on the FUNdamental or Learn to Train stage, where the emphasis on training should be on the learning and development of fundamental movement skills and basic ice hockey skills, has a totally different meaning than, for example, on the Train to Compete stage, on which the players should be able to strengthen their individual tactics as well team tactics. Chapter introduces the, study based, arguments for small-area games in the process of long-term player development as well as provides examples of different small-area games.

Chapter 6 discusses about the physical demands of the modern ice hockey and provides information on the physical qualities of today's ice hockey players on the top level. It provides knowledge on the trainability and age, which are key factors of the long-term athlete development model. It introduces, study based, facts for training the different physical qualities such as speed, endurance, strength and suppleness as well as developmental stage appropriate examples for training those. Chapter covers the recovery and regeneration by providing general information on the topics and by offering an example of regeneration type of training in the sport. It discusses about the physical testing for young players in ice hockey and provides developmental stage appropriate examples for testing.

Chapter 7 is about the proper nutrition. It discusses about the importance of proper nutrition among young athletes in general as well as the requirements and demands specific in ice hockey. Chapter provides examples of well planned, proper, meal plans for young players on each developmental stage by including suggestions of breakfast, snacks, lunches and dinners. It provides an example of a tool that is suitable for players to track their daily nutrition.

Chapter 8 covers the physiological growth and development as well as the educational potential of the sport. It discusses about the values and mental skills, that are learned by participating in ice hockey, and how those values and skills can be exploited in life outside the sport. Chapter provides knowledge on intellectual, emotional, cognitive, and moral development of a young player, which is again one of the key factors in the long-term athlete

development model, and the development process of improving the communication and social skills.

Chapter 9 is dedicated for the goalkeepers. It introduces the technical, tactical and physical demands of modern goalkeepers and provides knowledge and material on the coaching of goalkeepers at the different developmental stages. Chapter covers the basic techniques as well as individual and team tactics on goalkeeping. It discusses about the psychological demands of young goalkeepers and provides know-how on the coaching the topic itself. The objective is to be able to provide a goalkeeper specific chapter, which will offer both, goalkeeper specific knowledge and examples for goalkeeper coaches, as well understanding on the differences in coaching a goalkeeper versus a player for team coach.

Chapter 10 is about planning. Planning is an important part of coaching at any level and in any sport. Chapter discusses about the importance of the topic in ice hockey in general as well as about the specific demands on the proper execution of long-term player development. It introduces periodization, one of the key factors in the long-term athlete development model, and provides knowledge on, how to use it at the different developmental stages. Chapter provides developmental stage appropriate tools and examples on planning trainings, and planning periodization and annual cycles. The focus in the chapter is strongly on the long-term development of an individual player, instead of team.

Chapter 11 discusses about the competition among junior ice hockey. The aim is to provide knowledge on, what does the competition mean at each of the four developmental stages, what is the difference between long-term player development and short-term team achievements, and what is the meaning of well planned and organized competition in the process of long-term player development.

Chapter 12 is aiming to provide understanding on the role of parents in children and youth ice hockey. The main objective is to provide knowledge and tools for coaches, which they can use when communicating and interacting with parents. Chapter covers the responsibilities of parents and what are the factors, that they should understand and consider, in the process of long-term development of their child.

The last suggestions for the IIHF is to carefully consider, on what parts of the development process among children and adolescence, they really want to focus on. The IIHF PDG is a coaching tool provided by the governing body of ice hockey. It will most likely receive a great amount of publicity within the sport and the member national associations. It

gives the IIHF a great opportunity to outline the operational models and the priority sectors, that they want the member national associations to focus on. With the PDG, IIHF has a tool by which they are really able to influence globally, on the way ice hockey as a sport is develop, and young players raised.

7 Conclusions

The objectives of this research were to provide reasoning for the IIHF, as an international sport federation, to invest money and time on the execution of IIHF Player Development Guide, and to provide the IIHF PDG Workgroup a concrete proposal for the content of the guide. This research, that consisted of a quantitative research and a benchmarking process, succeeded to be effective in terms of its objectives.

As indicated in chapter 6 (Results and suggestions for IIHF), a reasoning for the global governing body of ice hockey, IIHF, was provided and a suggestion for the content of the IIHF Player Development Guide designed and introduced, in a simple one-page document. This suggestion, for the table of content, will be forwarded to the IIHF Player Development Guide Workgroup for further deliberation and elaboration so that the actual execution of the guide may begin.

7.1 Answers to research questions

Typically for this kind of research, which composes of a quantitative survey and a benchmarking process, the objective was to come up with answers to the research questions by referring to data collection and analysis. The research has succeeded in terms of answering to the research question, that were introduced in section 4.2 and were indicated to be following:

1. What is the reasoning behind the IIHF Player Development Guide –project?
2. What should be included in the IIHF Player Development Guide?

The PDG Survey provided vital information on the first research question. It was able provide valuable data from the field, concerning the reasoning for IIHF to produce the IIHF PDG. The results of the survey stated clearly that there is a major need, among the member national associations, for such long-term player development framework. The analysis on the IIHF as an organisation, that was executed as a part of the benchmarking process, provided also valuable information on the first research question. Objectives, mission statement and vision of the IIHF, stated how the organisation has engaged itself to the development of junior ice hockey, and to provide material on the development processes within the sport.

PDG Survey provided answers also on the second research question. Valuable information on the topic, was gathered from the 67 respondents from the member national associations. The data provided vital knowledge on, what are the demands on the field and what the guide should include. The analysis of the Youth Football –manual from the benchmarking partner FIFA, provided as well valuable knowledge on the content of a long-term player development framework, which is provided by an international federation in the biggest team ball sport in the world. The knowledge that was gathered from the analysis, was strongly effecting on the proposal that was given in section 6.4.

7.2 Enhancement suggestions and future use

As mentioned various times, this research composed of a quantitative research and a benchmarking process. The researcher had never used either of those, previously mentioned, methodologies in his earlier projects and naturally some factors could have been done better. The questionnaire that was executed during the IIHF Development Camp in July 2017, could have been better planned and organized to suit the objectives of this research. It would have been beneficial to perform the benchmarking process first and the PDG Survey after. That would have helped in planning and organizing the questionnaire so, that the survey would have been providing more detailed data on the content of the IIHF Player Development Guide. If the benchmarking process would have been performed before the execution of the PDG Survey, the researcher and the Survey Workgroup, would have had more knowledge on the framework of a player development guide, that was provided by an international sport association. That knowledge would have helped in the process of planning and determining the question that were asked. The benchmarking process would have provided the general view of the content of the IIHF PDG and the survey questions, would have then been better directed to provide the specific needs inside those areas of long-term player development.

Lack of time was the main problem with the PDG Survey. About a month before the IIHF Player Development Camp, the decision was made, that the survey will take place, during the 2017 camp in Vierumäki, Finland. The questionnaire was composed in quite a hurry and a possibility for performing the benchmarking process, before the execution of the questionnaire, was not realistic. At that time, it was not even decided, that the concept of benchmarking is going to be used in this research.

Despite the lack of time in the process of planning the questionnaire, the workgroup was able to come up with an entirety, which provided a great amount of data. The data, as in-

troduced in section 6.1, pointed out that the demand for the content of the IIHF PDG is extremely broad. However, as mentioned above, it would have been beneficial, if the questionnaire would have been planned in a way, that it would have provided more specific and detailed data within this broad field of material, that is demanded.

The benchmarking process was very efficient in terms of providing the structure for the content of the IIHF PDG. By analysing the Youth Football –manual, the researcher was able to produce a detailed view, about what a long-term player development guide of an international ball sport federation should include. However, the process of choosing a benchmarking partner between the Fèdèration Internationale de Football Association, FIFA, and the International Basketball Federation, FIBA, was challenging. It was impossible for the researcher to measure, which of the two global governing bodies, has produced a more efficient tool for its member national associations. There is no data available about, for instance, how many member national associations are actually using the player development frameworks, provided by FIFA and FIBA as well as no knowledge is provided on the influence of those frameworks in the process of developing the sport.

As mentioned in the last paragraph, the process of choosing the benchmarking partner was challenging. It could have been beneficial for the research, if the player development frameworks from both global governing bodies, FIFA and FIBA, would have been included in the benchmarking process. It would have provided a more extensive view on the topic. However, the benchmarking process, as it was exceeded, provided enough knowledge for the researcher in terms to be able to provide a proposal for the IIHF PDG Workgroup.

7.3 Validity and reliability of the research

When estimating the validity and reliability of the research, it is good to think, if it would have been beneficial for the research to include other international ball sport associations in the benchmarking process as well. However, the lack of time forced researcher to perform the benchmarking process only with FIFA. Football is the biggest and most played sport in the world and FIFA is known for its work for the development of sport and its resources.

As Heikkilä (2014, 1.) mentioned, for the reliability of a quantitative research, group of respondents and sampling has to be prominent and large enough, response rate high and the questions must measure the right things covering the research problem entirely. In the PDG Survey the number of respondents could have been higher and, as mentioned earlier, some of the questions could have been more detailed, but both factors are adequate and the survey can be seen as reliable.

The researcher is convinced, that the combination of the benchmarking process and the quantitative research, was the right choice for this kind of research. The results from both were highly similar and provided answers for both, research questions and objectives. Based on those, the validity and reliability of the research are both high.

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Appendices

Appendix 1. The PDG Survey

PDG Survey

The International Ice Hockey Federation (IIHF) is in the process of creating a Player Development Guide (PDG). The objective of the framework PDG is to provide the Member National Associations with resources, guidance and tools to develop ice hockey players and coaches in their countries as well as to recruit more players to the game. The foreseen users of the PDG are coaches, instructors, players, parents and administrators who manage the respective Programs. The users will be provided with relevant content, such as video, which they can use for every day programming.

The purpose of this questionnaire is to collect feedback from the MNA Representatives attending the relevant Programs in the 2017 IIHF Hockey Development Camp. Given the general objective of the PDG and the foreseen users of it, the opinion of the MNA Camp Participants is extremely important already in the design and development stage of this resource. Therefore, it is very crucial that all the questions are answered with full honesty. The questionnaire is anonymous.

The questionnaire makes reference to terms recreational, performance and high performance. Recreational refers to fun and non-competitive ice hockey. Performance refers to competitive and serious ice hockey. High performance refers to elite level, highly competitive and very serious ice hockey.

The IIHF wishes to thank all of the MNA Representatives for their feedback!

1. Which Program are you attending at camp? *

- ◯ Coaches Program
- ◯ Goalkeeper Coach Program
- ◯ Learn to Play Program
- ◯ MNA Leadership program

2. In which position is your country within the IIHF Men's World Ranking? *

- ◯ 1-6
- ◯ 7-13
- ◯ 14-20
- ◯ 21-30
- ◯ 31-40
- ◯ 41-50
- ◯ Not ranked

3. What is your current position within ice hockey?
Check all that apply. *

- ☐ Paid Coach in a club
- ☐ Unpaid (volunteer) coach in a club
- ☐ National Team Coach
- ☐ Strength and Conditioning Coach
- ☐ Team Manager
- ☐ Equipment Manager
- ☐ Working for the Association/Federation
- ☐ Working in an administrator position for a club
- ☐ Working in an administrator position for the association/federation
- ☐ Coaching Director
- ☐ Executive within a federation/association
- ☐ Other: _____

4. Do you think it is important that the IIHF produces a framework PDG? *

- ◯ Yes, very important

◯ Yes, important

◯ Neutral

◯ Not important

◯ No, not at all important

5. Should the PDG be mandated by Member Associations? *

◯ Yes

◯ No

◯ I don't know

6. Do you think your National Association would use such material? *

◯ Yes

◯ No

◯ I don't know

7. How important is it for your National Association to get such material? *

◯ Very important

◯ Important

◯ Mildly important

◯ Not important

◯ Not important at all

8. Would the PDG be beneficial for you in your role within your position? *

◯ Yes

◯ No

◯ I don't know

9. Do you think the PDG will help guide the development of both players and coaches? *

◯ Very much

◯ Much

◯ Somewhat

◯ Not much

◯ Not at all

10. Do you think it is important for the development of players to experience playing abroad? *

- ◯ Yes
- ◯ No
- ◯ I don't know

11. Do you think PDG guidelines will help coaches to prepare better training sessions? *

- ◯ Yes
- ◯ No
- ◯ I don't know

12. What are your needs considering PDG material?
Check all that apply. *

- ☐ What to coach at certain player development stages (games, drills, exercises)
- ☐ How to coach players at certain development stages (coaching of skills, skill progressions)
- ☐ How to coach a player who is lacking basic fundamental movement skills
- ☐ To standardize coaching objectives and methodology within an association, region and community?
- ☐ Other, please specify

_____

13. What material would you like to find in the PDG?
Check all that apply. *

- ☐ Teaching of skills
- ☐ On- and off-ice drills
- ☐ Skills and drill progressions
- ☐ Developmental stage appropriate drills and skills
- ☐ Individual tactics
- ☐ Team tactics
- ☐ Technical skills
- ☐ Practice planning
- ☐ Activity tracking tool

☐ Material for parents

☐ Other, please specify: _____

14. In which formats would you like to access the materials? Please rate the importance of formats. Check all that apply. *

	Very important	Important	Mildly important	Not at all important
Video	○	○	○	○
Video and text	○	○	○	○
Accessible on a homepage	○	○	○	○
Downloadable	○	○	○	○
Accessible through an app	○	○	○	○
Pictures	○	○	○	○
Posters	○	○	○	○
Activity cards	○	○	○	○
Manuals	○	○	○	○
Pictures and text	○	○	○	○
PPT/PDF format	○	○	○	○
Booklet	○	○	○	○

15. Do you think the PDG should be available in different languages? *

○ Yes

○ No

○ I don't know

16. Do you need information on proper nutrition, recovery and rest in the PDG? *

○ Yes

○ No

○ I don't know

17. Do you need information on the development of speed, stamina, strength, endurance, flexibility and mobility in the PDG? *

- ◯ Yes
- ◯ No
- ◯ I don't know

18. Do you need information on emotional, cognitive, physiological growth and development? *

- ◯ Yes
- ◯ No
- ◯ I don't know

19. Do you need information on how to develop communication and social skills of players? *

- ◯ Yes
- ◯ No
- ◯ I don't know

20. What are the player ages you wish to focus on? Check all that apply. *

- ☐ Children
- ☐ Adolescents
- ☐ Adults

21. Which competitive levels do you wish to focus on? Check all that apply. *

- ☐ Recreational hockey (playing hockey just for the fun of playing)
- ☐ Talent development (developing players who show talent playing hockey)
- ☐ Performance (how well a person, machine, etc. does a piece of work or an activity; from: http://dictionary.cambridge.org/dictionary/english/performance)
- ☐ High-Performance (better, faster or more efficient then others; from: https://www.merriam-webster.com/dictionary/high%20performance)
- ☐ Talent identification and development

22. What is an important outcome of a training session in your opinion? Check all that apply. *

- [ ] Players are having fun
- [ ] Players learn something new
- [ ] Good use of time
- [ ] Players develop new skills
- [ ] Coach develops
- [ ] Communication
- [ ] Team building
- [ ] Understanding
- [ ] Fair Play
- [ ] Other

_____

23. Should the PDG feature information on step by step skill development? *

- ◯ Yes
- ◯ No
- ◯ I don't know

24. Would it be important that basic movement and sport-specific movement skills are featured in the PDG? *

- ◯ Yes
- ◯ No
- ◯ I don't know

25. Are you regularly organizing Fun Hockey Days, Free Hockey Days or other events to recruit new players? *

- ◯ Yes
- ◯ No
- ◯ I dont' know

26. Do you need material on how to successfully organize such events? *

- ◯ Yes
- ◯ No
- ◯ I don't know

27. What areas do you require recruitment information for? Check all that apply. *

- ☐ Coaches
- ☐ Players
- ☐ Volunters
- ☐ Officials
- ☐ Administrators
- ☐ Others, please specify

_____

28. Do you have enough volunteers (coaches, instructors, administrators, managers, etc.) to help organizing events (e.g. free Try Hockey events; skating school; hockey school; World Girls' Ice Hockey Weekend; etc.)? *

- ◯ Yes
- ◯ No
- ◯ I don't know

29. Do you need the following materials for player recruitment? Check all that apply. *

- ☐ Recruitment material
- ☐ Posters
- ☐ Flyers
- ☐ Templates for different kind of posters, flyers, friend postcards, etc.
- ☐ Off-ice programe
- ☐ On-ice program
- ☐ Drills and games
- ☐ Other, please specify

_____

- ☐ Not needed

30. Are you trying to increase the number of recreational ice hockey players (non-competitive league/non-serious league) in your country? *

- ◯ Yes
- ◯ No
- ◯ I don´t know

31. To which of these age categories are you trying to recruit players to? *

- ☐ Children under the age of 10 years
- ☐ Adolescent U18
- ☐ Adults
- ☐ Adults +30 years of age

32. What is the most important outcome for you of a Learn to Play program? *

- ☐ Children are having fun
- ☐ Children learn something new
- ☐ Children join the team/club after the Learn to Play Program
- ☐ Other, please share _____

33. Do the clubs in your country have programs for recreational players (non-competitive) and for competitive players? *

- ◯ Yes
- ◯ No
- ◯ I don't know

34. What are developmental areas of priority for your youth players? Check all that apply. *

- ☐ Fun
- ☐ Community
- ☐ Develop new skills
- ☐ Team building
- ☐ Learn to trust other players
- ☐ Learn to support other players
- ☐ Fair Play

☐ Other, please give an example

_____

35. Do you need a strategy to minimize the drop-out rates of your players? *

◯ Yes

◯ No

◯ I don't know

36. Do you think your National association needs a coach education program? *

◯ Yes

◯ No

◯ I don't know

37. What in your opinion should be included in a coach education? Check all that apply. *

☐ Skill development for players

☐ Technical aspects of the game

☐ Tactical aspects of the game

☐ Team tactics

☐ Team plays

☐ Individual player tactics

☐ Certification system

☐ Materials for coach education for different levels and domains

☐ Subject matter expert coaching on developmental stages of players

☐ Physiology

☐ Nutrition

☐ Rules and Regulations

☐ Ice Hockey specific conditioning

☐ Sport Psychology

☐ Player evaluation

☐ Self-evaluation

☐ Designing a training program

☐ Implementing training methods

- [ ] Developmental stage specific skill development
- [ ] Planning and evaluating a training program
- [ ] Creating a positive team culture
- [ ] Managing risks
- [ ] Coaching styles and skills
- [ ] Parent management
- [ ] Parent education
- [ ] Other, please share:

_____

38. Do you think a coach should have the following capabilities? Check all that apply. *

- [ ] Develop a vision for the team, club and organization
- [ ] Be able to plan long-term goals/strategy for players/programs
- [ ] Build the environment for the team/club/organization so that the goals of the player's/program's can be fulfilled
- [ ] Build positive relationships with stakeholders
- [ ] Conduct skill-level appropriate practices
- [ ] Select and prepare for appropriate competitions
- [ ] Have the knowledge to make informed decisions on the training program/plan of the players/program in view of training performance in a dynamic environment
- [ ] Reflect on own performance
- [ ] Continuously wotk on personal and professional development

39. Is it important for you that coaches develop their own coaching philosophy? *

- ◯ Yes
- ◯ No
- ◯ I don't know

40. Do you expect coaches to continuously work on developing their professional knowledge? *

- ◯ Yes
- ◯ No
- ◯ I don't know

41. In your opinion, are ethical working standards for coaches important in a coach education? *

- ◯ Yes
- ◯ No
- ◯ I don't know

42. Do you think a coach education program should also include practical demonstrations where core competences/capabilities must be demonstrated? *

- ◯ Yes
- ◯ No
- ◯ I don't know

43. Are the following areas important for you to be included in a coach education? *

	Yes	No	I don't know
Professional knowledge (Sport/Science/Technical and Tactical aspects)	◯	◯	◯
Interpersonal knowledge (Social contact/Relationships)	◯	◯	◯
Intrapersonal knowledge (Coaching philosophy/life-long learning)	◯	◯	◯

44. What are the coaching functions, competences, knowledge and values that you would like to be reflected in a coach education? *

- ☐ Coaching philosophy
- ☐ Developing the environment
- ☐ Communication skills
- ☐ Problem solving skills
- ☐ Personal and professional development
- ☐ Life-long learning
- ☐ Participant-centred coaching

45. Do you require a certification system for coaches? *

- ◯ Yes
- ◯ No
- ◯ I don't know

46. For which areas do you need coaches? Check all that apply. *

- ☐ Coaches for recruitment initiatives
- ☐ Coaches for beginners
- ☐ Coaches for non-competitive players
- ☐ Coaches for adult players
- ☐ Coaches for emerging players
- ☐ Coaches for competition players/teams
- ☐ Coaches for performance players/teams
- ☐ Coaches for high-performance players/teams

47. Do you curently feel you are a valued voice with your National Association? *

- ◯ Yes
- ◯ No
- ◯ I don't know

Possibility for a comment:

◯ _____