

Development of the positional playing skills in different gamesituation roles in ice hockey

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<p>Title of thesis Development of the positional playing skills in different gamesituation roles in ice hockey</p>	<p>Number of pages and appendices 40 + 2</p>
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<p>The principal objective of the thesis is to provide coaches' video material to teach the most important playing skills based on players position assigned by the coach needed in ice hockey.</p> <p>The material is targeted for coaches, head of coaches and coaching educators. The aim of the video material is to provide a better illustration of the positional playing skills required in the different game situation roles. In theory part different aspects related to playing skills are introduced to provide a reader better understanding about complex nature of playing skills needed to play ice hockey in elite level.</p> <p>Based on theoretical framework. On ice drills to develop playing skill in both playing positions, forward and defensemen were created. Filmed and edited material is available in hockey centre website managed by International ice hockey centre of excellence. All the filmed material is divided by player positions, game-situation role, game situation and zone of the rink to form a complete drill bank. By video material purpose is also to give simple picture how to play most typical game situation depending on players' position.</p> <p>This thesis is made in cooperation with International Ice Hockey Centre of Excellence and authors Club, Espoo Blues to serve development of Finnish and International ice hockey. Thesis project was started 2008 and finished 2011.</p>	
<p>Keywords Ice hockey, playing skills, position, gamesituation role, offence, defence</p>	

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1 Introduction

Many times coaches, scouts etc. discuss which abilities make a quality player. Someone likes good skaters, while the other likes hard working players who are not afraid to sacrifice their body for the teams' best. With this thesis project a whole new angle for player development has been taken by looking at how a player's position affects playing in different game-situation roles.

The greatest challenge in ice hockey coaching is to develop individual players in a way so that they are able to use all physical, technical and tactical qualities effectively during the game. For this reason this thesis project has as its principal objective playing skills needed most in both offence and defence depending on the player's position.

The theory part introduces what the term "playing skill" means, and what technical and tactical skills and qualities a player has to master in order to perform playing skills effectively in different game situations during the game.

To illustrate the big picture behind playing skills the starting point is always the game. Video clips taken from 2008-2009 Espoo Blues SM-league games present the most common situations faced by players in different positions. To get a broader view of elite level ice hockey, various national and international games from different leagues and tournaments have been followed in both senior and junior levels from 2008 to 2011.

The focus in this project is in both offensive and defensive situations, because to develop better players for today's fast paced and individually demanding elite level ice hockey a player has to have a comprehensive understanding and an advanced skill level to succeed. The challenge in playing skills, especially when observing them based on playing position, is that there are not much data available and the terminology alternates a lot. To keep all material in order and to avoid complicated terminology all categorising is done according to ones used by Finnish Ice Hockey Association.

I prefer a reader to take a closer look at both parts of this project, theory and video material, to get a good view about the positional playing skill development. The drills

illustrated in the video material are kept simple and game-like, so it would be easy to relate to the game the on first look. This model should give a picture of what technical and tactical requirements are needed to play the game effectively.

To focus on playing skills that can be developed on ice, all the physical and mental qualities are excluded from this project. The drills used in the video material are all based on playing skills required to achieve the team play objectives without any connections to team play system or tactics, which may sometimes limit the use of some skills or options in decision making.

2 Long-term player development

The ultimate goal of player development is to help the individual player to reach his full potential, measured by his season-long performance on ice. To be able to play ice hockey effectively a player obviously needs the skills to play the game on both sides of the puck, offence and defence. Playing skills are a combination of technical skills and hockey sense, meaning that a player must understand what technical skill or combination of technical skills he must use to help his team the most effective way according the situation (Vähä-Ruohola, 2009).

Technical skills e.g. skating, passing, and shooting, lay the foundation to move on ice and give a player the fundamental abilities to play the game.

Hockey sense is the knowledge needed to play the game according to the rules and objectives of the game, as well as an understanding of the game-situation roles needed for decision making for the advantage of one's own team during the game (Westerlund et al. 1986).

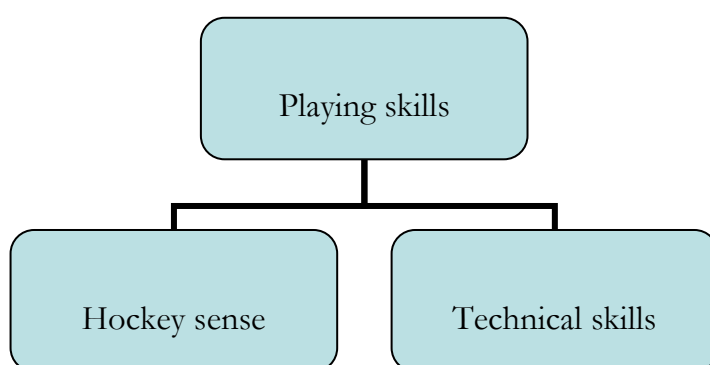


Figure1. Composition of playing skills (IIHF 2007, 2)

2.1 Significance of training

In a long-term perspective of player development, the most important aspect is the “ten-year rule”. An athlete must practice his sport 10 years or 10,000 hours to become an expert in his field (Baker 2003, 86).

The ten-year rule becomes important when doing periodization of the training. To have enough quantity and quality in training is highly important, especially in playing skill development because it is structured from two different components, technical skills and hockey sense. Most importantly, coaches and other people who are in charge of player development should aim to produce experts in their sport.

In his review article “Early specialization in sports” Baker (2003, 86) introduced the following characteristics to explain expertise in sports.

- Experts have greater task-specific knowledge.
- Experts interpret greater meaning from available information.
- Experts store and access information more effectively.
- Experts can better detect and recognize structured patterns of play.
- Experts use situational probability data better.
- Experts make decisions that are more rapid and more appropriate.

To link together the ten-year rule and the characteristics of an expert development of playing skills, the following factors must be understood for players to reach their full potential in adulthood.

- The amount of hours spent for training should be 1000 hours per year within 10 years, which means a child should be active in sports 2,7 hours a day from age 10 to age of 20 when he grows out of juniors.
- Game-like conditions must take place in each practice, so players can gain task-specific knowledge to learn to understand the game.
- Coaches should give lot of data and models about the game to promote development of hockey sense.

2.2 Challenges in long-term player development

Professor Mark Williams has studied the training history behind elite level athletes in Britain. According to Williams, an athlete will have a chance to reach an elite level in adulthood if he has reached 10,000 hours of quality training (Järvinen 2009, 8). This

contradicts a typical explanation that great players are just born or have great genetics for the sport they master.

Williams points out that most elite level athletes have spent more time practicing on their own during childhood than the ones who got close to elite level or stayed in recreational level. E.g. a 12 year old football player who reached Premier League trained 2500 hours on his own between the ages of six and the time they reached professionalism, while a player who only got to the recreational level trained 750 hours within the same period of time (Järvinen 2009, 8). The teenage years are said to be the most challenging time in long-term development due to growth spurts, other interests, increasing competition, and external demands. This might even be true in some cases, but according to research made by Williams, 13-16 year olds who later reached Premier League trained on their own an average of nine hours per week (Järvinen 2009, 8).

Dr. Harri Hakkarainen has studied training in Finland in recent years and also researched history to compare children's physical development during past 20 years. According to Hakkarainen (2009) over half of the children 11 years and under belonging to sport clubs did not move enough to even reach hours required meet national health standards (Hakkarainen, 2009). Organized training in teams and clubs increases when children get older, but the time spent on exercising and practicing during one's own time decreases so much that organized training hours can't cover the shortcomings caused by decreased individual training (Hakkarainen, 2009).

Williams also made findings about differences in visual observation abilities between the children who later reached elite level and the children who did not. Already at age of eight children who became elite level players were able to make faster and better visual observations during a game. The same development continued with 12 and 16 year olds (Järvinen 2009, 9). This is important to notice when talking about the development of hockey sense. Elite level hockey requires a player to make accurate visual observations and make correct reactions and decisions based on what he has seen. Related to William's results, hockey sense development should also begin earlier through play and questioning methods that are not too tactically complicated for young child-

ren. Williams also told that the ones who reached elite level also trained more (Järvinen 2009, 9).

Would better visual observation skills be explained with more time spent on playing?
Or do better technical skills give player more time to focus on visual observations?

According to Hakkarainen (2009) children who are 12 and over should spend at least 18 to 20 hours a week for sports and other physical activities if they want to reach an elite level. These hours should be divided between playing and practicing during one's own time and organized sports.

3 Technical skills

Technical skills are the foundation of playing skills. Without excellent technical skills a player will have limitations in his overall game. A player with excellent technical skills will have the “tools” to play the game. Ice hockey coaches should spend much time to developing technical skills when children join ice hockey teams. Practices should be fun and include high amount of repetitions to learn correct the techniques in skating, passing & receiving, puck control, and shooting (IIHF 2007, 1-2).

When you are teaching skills, correcting errors, solving problems, or explaining a new drill, it is done through communication (IIHF 2007, 3).

Skating	Puck Control	Passing and Receiving	Shooting	Body contact, Checking
Forward skating Backward skating Turns and cross-overs Stops and starts	Moving puck handling Puck protection Deception	Moving Deception	Wrist shots Slap shots Backhand shots Tips and deflections Deceptions	Angling Stick Checks Body Contact Body Check

Figure2. Technical Skills (Modified from Belmonte 2004, USA Hockey Skills Progressions Handbook)

3.1 Skating

Skating is the most important technical skill in ice hockey, because of the enclosed ice surface where the game is played, high speed, and transition.

The ability to skate is directly related to the performance of other technical skills such as puck control, passing and receiving, etc. Time spend on improving skating has then

much value to the development of all technical skills needed in ice hockey. (Hockey Canada 2005, 6)

All skating in ice hockey should be economical and powerful. In forward skating the most important quality is to get from place A to place B as fast as possible with or without a puck. According to the nature of all invasion games, the transition part of the game is highly important, placing strong demand on a players' ability to change direction and pace by crossovers, turns, stops, and starts (Hirvonen & Puolakka, 2009).

The basics of quality skating are: Balance on one foot, control of the inside and outside edges, weight transfer from one skate to another, good posture and knee bend, and weight on the middle of the blade (Hirvonen & Puolakka, 2009).

3.2 Puck control

Puck control skills are needed to control the playing instrument (puck), and to beat an opponent in one-on-one situations when playing on offence. Even though players spend most of time on ice without a puck during a game they enjoy practicing with the puck the most. Due to limited time as a puck-carrier, the player should have good skills to be effective during that time (Hockey Canada 2005, 10).

Different puck control skills are; carrying the puck, puck protection, and deceptions (USA Hockey 2006, 1-5).

The teaching progression of puck control skills should begin from stationary to moving puck control (Hockey Canada 2005, 10). The player should master all the puck control skills while skating normally without looking the puck, so he is able to see the game.

3.3 Passing and Receiving

Passing is a player's way to cooperate in offence. A player with great passing and receiving skills is not only an offensive threat to the opposing team, but also defensively secure for his own team, because he is able to maintain possession by passing (Westerlund et al. 1986).

To be able to play the game effectively a player must be able to pass the puck from skating from the forehand, backhand, by saucer, one touch, and via the boards, and receive while skating from the forehand, backhand, skates. Players with good passing skills can play the offensive game with greater speed and are more difficult to defend (Varmanen, 2010).

3.4 Shooting

Shooting is the most important technical skill for scoring. Different shots used in scoring are; Wrist shot, slap shot, and backhand shot. (USA Hockey 2006, 4)

The most important shot to learn and use in hockey is the wrist shot. It is the most versatile and quickest of all shots. The second most effective shot is the slap shot, which is usually the slowest to execute, but has the most power. These two shots are the most effective shots in scoring. Drills in practice should promote the use of these shots. As in all skill actions the basic techniques must be mastered before a player can be effective in a game situation where the time and space are limited (Andrews 2009, 67).

3.5 Stick checks

Stick checks are important technical skills needed in defence. Hockey Canada (2005) has defined different stick checks in the educational "Skills of Gold" videos in the following way:

- Lifting a stick: Defending player slides his stick under the opponents stick and with a rapid movement lifts the opponents stick.
- Poke check: Defending player uses the blade of the stick to push the puck off the stick of an opponent.
- Sweep check: Defending player “sweeps” his blade against the opponent’s blade to eliminate puck control, a pass, or a shot. The key in sweep is to get the blade against the blade.

3.6 Body contact

One-on-one battles are one of the turning points during the game. To be able to win one-on-ones and play the game with fair play and respect, the basic elements of body contact should be taught to players.

According to USA Hockey (2008, 1) body contact includes contact confidence, body blocks, and takeout/rubout checks. All body contact techniques introduced previously aim to deny space from the puck-carrier by stopping the momentum.

The basics of body contact include: 1. Proper body position: Knees bent, wide base, and stick in one hand. 2. Power for the contact comes from the legs and hips. 3. Never start any body contact unless there is a no gap between you and the opponent. (USA Hockey 2008, 7)

3.7 Body checks

Body checking is a fine aspect of the game and an important defensive skill to separate the opponent from the puck. All body checking must be understood and performed correctly by the official rules, fair play and respect. Body checking, in particular shoulder checks and hip checks are built on the foundation of all other individual defensive skills (USA Hockey 2008, 1).

The official playing rule's definition of body checking is: "A legal body check is one in which a player checks an opponent who is in possession of the puck, by using their hip or body from the front, diagonally from the front, or straight from the side, and does not take more than two fast steps in executing the check." (USA Hockey 2003-2005 Official rules of ice hockey)

A legal body check must be done only with the trunk of the body, meaning the hips and shoulders, and must be above the opponent's knees and below the neck. Unnecessary rough body checking must be penalized. (USA Hockey 2003-2005 Official rules of ice hockey)

4 Hockey Sense

Hockey requires not only technical skills introduced in the previous chapter, but also high level of knowledge and an understanding of the game itself.

A player with great hockey sense has cognitive expertise in the tactical field of the game. Cognitive expertise can be divided into two sub domains, tactical skills and decision-making abilities (Starkes & Ericsson 2003, 22).

A super-talented player with great hockey sense can see all the options available in half a second and is able to pick up the best possible option (Holtari, 2007).

Hockey sense can be developed by practising on and off the ice by using games, game-situation or cooperation drills where a player must make decisions based on visual observations (FIHA).

While the player is moving constantly, observing surroundings, thinking and reacting to the rapidly changing situations, the player with good hockey sense can use his technical skills, physical and mental capacity optimally in the situation at hand (Westerlund 1997, 534).

According to the Finnish Ice Hockey Association (FIHA) hockey sense consists of three different parts;

1. Understanding the game.
2. Reading the game.
3. Decision making.

To play the game effectively a player must understand the rules and objectives of the game and the action principles in different situations. When he understands the game and sees the game he can read and react to the current game situation. Based on that understanding and reading he can make the right decisions and use his playing skills during the game for the advantage of his team. (Westerlund et al. 1986)

4.1 Understanding the game

To be able to understand the game, a player must know the purpose of the game, which is to score more goals than the opponent (Webb & Pearson, 2008).

A player must also understand the general rules of the game to play it by the rules. Understanding the game includes also the knowledge that the team who has the puck is playing offence (trying to create opportunity to score), and team without the puck is playing defence (preventing opportunity to score). When either team doesn't have puck control, the team is either battling to get it or getting ready for transition from defence to offence or from offence to defence (FIHA).

A player should understand the team play objectives in both defence and offence. The team play objectives tell them what they should try to achieve depending on distance from offensive and defensive net, and the situation against the opponent. For example, is it possible to attack quickly against an unorganized defence or would it be smarter just to maintain puck control because the opponent has organized the defence against us (Lukkarila, 2007).

4.1.1 Team play objectives in offence: Scoring

Studies have been made from goal scoring through the years. The most important finding of those studies that relates to the general understanding of the game is that most goals are scored inside "the scoring circle". In scoring supporting actions, such as rebounding, deflecting and screening are key factors behind effective scoring. (Saarinen, 2007) All other team play objectives in offence describe or support different ways to create a scoring chance inside the scoring circle with either a fast attack, where the first action is to win space forwards, or slow attack, where team controls the puck before they are able to play towards an offensive direction.

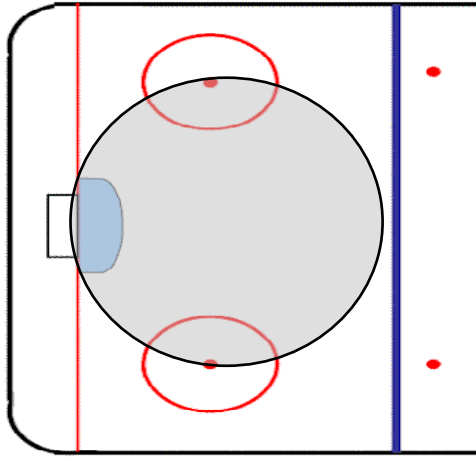


Figure3. Scoring Circle (Mikkola 1987, 11)

4.1.2 Team play objectives in offence: Winning space

Winning space has been explained by Luoto and Pikkarainen in their bachelor's thesis on offensive game situation roles as "the quickest possible way to get to the scoring area with as small risk as possible" (Luoto & Pikkarainen 2007, 13). Winning space requires excellent offensive readiness from all players. A quick change of rhythm after a team has gained possession of the puck is the most important action that has to happen. This can be created by quickly carrying or passing to the offensive direction or by transferring the puck into empty space on the next zone of the rink, e.g. from the defensive zone to the neutral zone where a player of the offensive team is able to collect it. Carrying or passing from a small space close to boards towards open ice in the middle also fits under winning space, if it contributes to offensive play towards the offensive direction (Hyvärinen & Ruottinen, 2009 and Westerlund 1997, 536).

4.1.3 Team play objectives in offence: Creating space

If the team is not able to win space, then its objective is to maintain possession by controlling the puck and to create space for another opportunity to win space (Westerlund, 2007). Creating space by puck control is important for offensive play; of course not only due to the fact that the team can look for another opportunity to score from protecting puck by moving puck protection of a puck-carrier or by passing the puck from one player to another before finding a way to break the opponent's defence to get a

scoring chance, but also by securing their own defence because the other team can't score without the puck. Good puck control at the team level requires players to have good technical skills to move and control the puck, continuous close support from non-puck carriers, and the ability to pass and receive passes while moving (Varmanen, 2010).

4.1.4 Team play objectives in offence: Transition to defence

Transition from offence to defence after the puck has been lost is important for the team's ability to have continuum in its play. This transition phase has been described with the term "defensive readiness". Defensive readiness reflects the team's ability to organize its defence against the opponent's attacks starting from the defensive, neutral, or offensive zone (Lukkarila, 2007). An individual player should be ready to react and change skating direction after the puck has been lost according to the direction of the game (Hyvärinen & Ruottinen, 2009). Readiness to play defence requires an instant role change from offence to defence in both the team and individual levels. In addition to change of skating direction, a player should have his head on a swivel and the ability to understand his own role in a situation to give pressure, support, or create cover for the defensive side of the play. Readiness to play defence should be maintained all the time while playing offence; this is most beneficial for the team in continuous play because it forces an opponent to attack mostly against organized defence. (Luoto & Pikkarainen 2007, 9) Transition from offence to defence and vice versa is, at least in elite level "coded" into a team play system in a way that the structure of offence automatically gives a team readiness for transition, because systems are built to support each other to increase unit game speed. (Marjamäki, 2008)

4.1.5 Team play objectives in defence: Preventing opponent from scoring

The most important task in defensive play is to prevent the opponent from scoring. (Luhtanen 1989, 324) In ice hockey preventing the opponent from scoring has been described as cooperation occurring between the defensive players and the goalie, when the opponent has a chance to score. A way to prevent scoring is shot blocking with body or stick (Westerlund et al. 1986). To prevent the opponent from scoring, the de-

fensive team should limit the offensive teams' access to scoring the circle with the puck. Shots coming outside the scoring circle have a purpose to create offensive pressure, especially in the NHL where rule changes have increased the size of the offensive zone (Saarinen, 2006). This rule change has made tight man-on-man coverage more difficult and has forced teams to transfer into zone defence where the defensive team focuses on covering non-puck-carriers inside the scoring circle, so they are unable perform supporting actions effectively. The same rule change has also increased the amount of shots blocked by field players.

4.1.6 Team play objectives in defence: Preventing opponent from winning space

Preventing opponent from winning space has been described as, "Positioning between the opponent and own goal, angling the puck carrier from big to small space" (Westerlund et. al.1986).

The rules of the game and the playing surface set valuable markings for defensive players when they are preventing opponent from winning space forwards, e.g. tight defending on offensive blue-line keeps the puck inside offensive zone giving opportunity for quick transition near offensive goal. Taking away space before the redline denies offensive teams the opportunity to use dump-ins and stepping up on the defensive blue-line often forces the offensive team to dump in, which decreases the amount of straight attacks.

The effective prevention of the time and space requires quick reactions from a defending player closest to puck carrier, so that the mid-lane is covered and the opportunity to carry forward is limited. The other defending players should keep the five-man unit tight and cover passes targeted to the middle. Defensively strong team is active in all zones, disciplined, and especially strong when securing the front of their own net, which is the most important zone in defence (Hyvärinen & Ruottinen 2009, Westerlund, 2007).

4.1.7 Team play objectives in defence: Regaining possession of the puck

A defensively effective team is able to steal the puck quickly after it has been lost to the opponent or when the puck is not in control of either team. An individual player's ability to read, react and cooperate plays a key role in regaining possession at a team level. Emphasis on active prevention of time and space with the use of clean body and stick checking with purpose to separate the opponent from the puck creates chance for the defending team to regain possession of the puck.

According to Westerlund et al. (1986) possession is most often gained close to the boards, and requires cooperation between the defending players'. For example a player defending against the puck carrier creates a loose puck by body checking and a player defending against a non-puck carrier is ready to collect the loose puck or intercept a pass to the player he is covering.

A player defending against a non-puck carrier should position himself between the goal and his own net, inside the dots to be able to support and collect loose pucks. In the defensive zone the principle of "low-triangle", seeing the player being covered and the puck, is a key for readiness to regain possession effectively and to maintain defensive security.

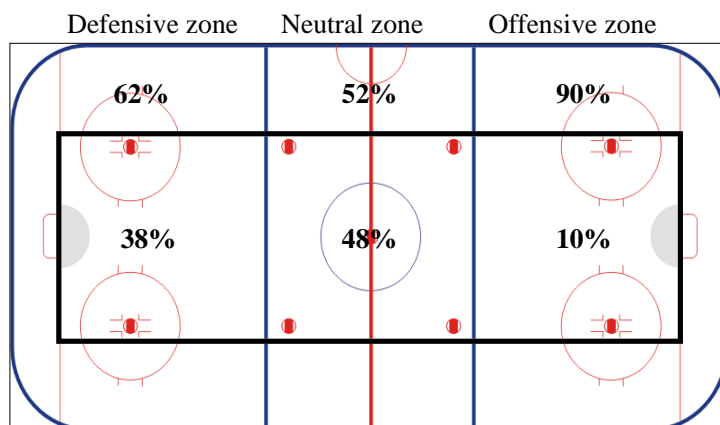


Figure4. Percentage of steals in different zones (Westerlund et al. 1986)

4.1.8 Team play objectives in defence: Transition to offence

Transition from defence to offence after the puck has been regained requires that players quickly read and react, so that they are able to anticipate the direction of the play when offensive play begins and are able to select whether they should win space or create space. Lukkarila (2007) described this phase as “offensive readiness”. The ultimate goal for offensive readiness is that the team can get an odd man rush. Quick transition from defence to offence requires that the players; not only understand the game, but also have the ability to change skating direction and rhythm after the team has gained position (Savolainen, 2008). Quick transitions give an opportunity to attack against unorganized defence, which is obviously easier to break than tight five-man unit. To be able to create quality scoring chances through transition sets a high demand on playing skills. An effective player is able to make the right decisions between skills in order to advance team play, e.g. selection between carrying or passing and the direction of those actions.

From a player development perspective the following table from Westerlund et al. (1986) gives coaches knowledge of different actions taking place in transition from defence to offence. These skills are valuable tools to increase individual game speed, and through that, the game speed of the entire team.

Table1. Ways to advance the game after gaining possession (Westerlund et al. 1986)

Individual action	4 Games	Team	Player	%
Wall pass	555	70	5	14
Short carry and pass	1511	189	13	32
In place and pass	309	39	3	8
Transfer	282	35	2	7
Carry	643	80	5	17
Continues in 1 on1 battle	197	25	2	5
Shot off a pass	138	17	1	4
Short carry and shot	171	21	1	4
In place and shot	58	7	1	2
Total	3864	483	33	100

According to findings from Westerlund et al. a player should quickly change rhythm and be ready to give a short pass after gaining possession. In the offensive zone a player without puck should have readiness get open, and shoot rapidly if he gets the puck inside the slot.

4.2 Reading the game

After the player is able to understand the game, he can “read” it while in action. You can often hear coaches shouting to his player “read the game!” but does the player understand what he must read?

Savolainen (2008) explained reading the game in his game-speed seminar presentation in the following ways;

1. The speed of recognizing the situation in the offensive game is the ability to select between a fast counter-attack and a slow control attack.
2. The speed of reading the situation in the defensive game is the ability to select between a fast, high pressure forecheck and a slow (organized) defence.

Savolainen’s explanation of reading the game reveals Baker’s (2003, 86) characteristics of an expert presented earlier in this thesis, when thinking about the players’ ability to use data from visual observations they constantly make while playing. a player who is able to read the game well can anticipate what will or what is most likely to happen next, and is able to make the right decisions to enable team play faster than his opponent.

4.3 Game situation roles

During the game a player is in one of four different roles while playing, which are commonly known as game situation roles. In Finnish ice hockey, game situation roles have been under discussion for the past twenty years, and many coaches have discussed if the players understand these roles or not, and whether to talk about them and

teach them or not? The truth is that game situation roles are and will be present in every invasion game, when amount of players on the field is two or more on each side.

Invasion are team games where the purpose is to invade the opponents territory with the aim being to score more points within the time limit than the opposing team, while endeavouring to keep their score to a minimum. Subcategories include where the ball can be carried or caught across the line (e.g. Rugby league, rugby union, touch), it can be thrown or shot into a target (e.g. netball, basketball, handball, lacrosse) or it can be struck with a stick or foot into a target area (e.g. hockey, soccer, Australian rules football) (Webb & Pearson 2008, 4)

The game-situation roles in offence are puck carrier (role1) and non-puck carrier (role2). In defence the roles are defence against the puck carrier (role3) and defence against the non-puck carrier (role4) (Westerlund et al. 1986).

Players may not always understand coaches' talk about game-situation roles, but for the coach, knowledge of game-situation roles and skills essential. To know all situations taking place in a game gives the coach a picture of the different skills and tasks he needs to teach his players.

In the individual level, the speed of changing roles from offence to defence or vice versa, and from puck carrier to non-puck carrier cultivates a developed hockey sense and individual game speed. (Savolainen, 2008)

4.4 Making decisions

The ability to make decisions depends on a player's ability to understand, read and react during play (Westerlund et al. 1986). For a player who has the tools to play and is able to understand, read & react, decision making is the final step to achieve a team play objective in a current game situation; e.g. shoot or pass in 2-1 attack. During the game a player is constantly making different decisions and most options in decision making are related to the individual player's task to help his team achieve a team play objective with or without the puck in offence or against the puck carrier or non-puck carrier in defence; e.g. does a player give pressure to regain the possession or angle to

prevent the opponent from winning space towards mid-ice? A player is also making decisions when selecting what technical skill he should use to solve the situation at hand, e.g. wrist shot or backhand pass in 2-1 attack.

Savolainen (2008) illustrated in his game speed lecture pictures about the “flow of a game”, in offensive and defensive situations. These pictures give a great illustration related to decision making e.g. fast or slow attack, and playing skills needed to be able to attack fast. When looking at Savolainen’s way of presenting offensive and defensive play it is interesting to see the simple division of attacks according to game speed. Offence and defence are either fast (organized) or slow. This method helps a player in his decision making because there are not too many options and the terminology is simple. To help our players make better decisions on ice and use their playing skills more effectively we should give them; 1) a clear picture of the goal and objectives they are trying to achieve while playing, and 2) the training should be based on the skills required to become a more effective player by reaching one’s top mental, physical, and technical capacity.

To make accurate decisions a player should understand the flow of a game, which playing skills to use according to the situation at hand and, in doing so, to help his team to control the flow of a game.

A = Slow attack against well-organized defence

B = Fast attack against unorganized defence

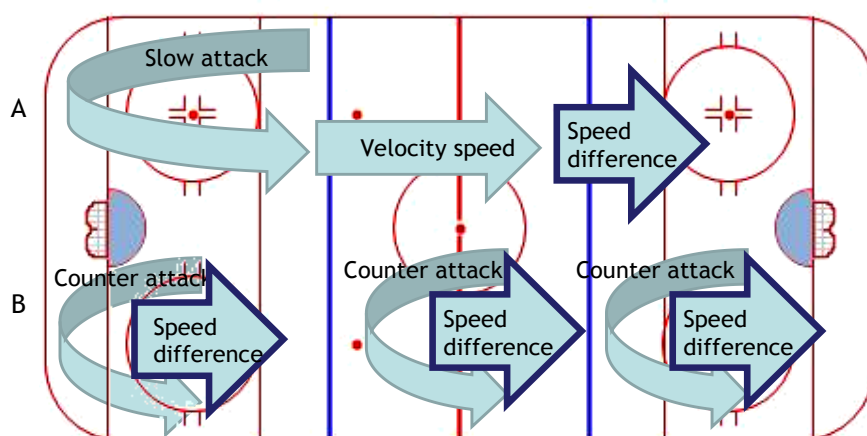


Figure5. Unit game speed in offensive play (Savolainen, 2008)

A = Organized defence against organized attack

B = Fast defence against fast unorganized attack

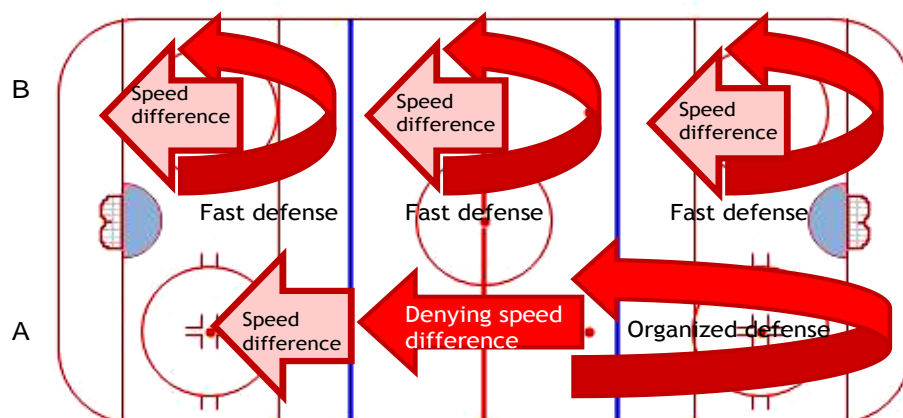


Figure6. Unit game speed in defensive play (Savolainen, 2008)

Decision making options can also be limited by a coach who has set rules according to a team play system; e.g. “we will only give first pass forwards or sideways when breaking out from the defensive zone.” Options limited by the coach in the early stages may prevent the development of hockey sense, because it prevents the player from having to learn all possible options he could do, and prevents learning by trial and error because he will not experience something that is possible and may happen in a game. a player who is constantly doing right decisions has good playing skills, because is able use the right technical skills for the situation at hand. This kind of player is productive for his team.

5 Playing Skills

Playing skills are an individual abilities composed from technical skills and adapted into game situations (Hyvärinen & Ruottinen, 2009).

As mentioned earlier, playing skills are the combination of technical skills and hockey sense. The same conclusion was also made by Vähä-Ruohola (2009) when explaining the meaning of playing skills. The purpose of playing skills is to win 1-1 situations and advance team play according to the team play objective in the current situation. Playing skills require good timing and observation of the opponent, compared to technical skills.

Before a player or team is able to play according to a certain team play system, they must have the playing skills necessary to master most typical game situations, e.g. 1-1, 2-1, 2-2, 3-2 and 3-3. Otherwise they are just like chessmen on the coaches' chess-board, probably in the right place but don't know or can't do anything to solve the problem.

Playing skills are, for example, scoring, puck protection, offering a pass option etc. in offence, shot blocking and different checks etc. in defence (Vähä-Ruohola, 2009).

Playing skills are tools for problem solving during the game, when the team play objectives, e.g. "winning space" is a theoretical objectives of the offensive team and for players in offensive roles, carrying the puck from small to big ice immediately after steal, in a defensive zone is a playing skill that can be practiced over and over again.

Learning fundamentals of the playing skills is allows mastery of technical skills, but it also requires good hockey sense and wide base of physical and motor skills (Hyvärinen & Ruottinen, 2009).

Teaching and training of playing skills requires that the coach poses knowledge about game e.g. rules, objectives, roles, and ability to see the difference between technical skills and playing skills (Hyvärinen & Ruottinen, 2009).

5.1 Playing skills of the elite player

I have selected a minimum of two and maximum of five of the most important playing skills needed to achieve each team play objective. The purpose is to describe and illustrate the playing skills of an elite player without dividing them according to the player's position and game-situation roles. A playing positions effect on the use of a certain skill will be discussed in the following chapter. The playing skills represent in chapters 5.1.1 and 5.1.2 are selected from Finnish Hockey Associations coaching education material made by Westerlund et al. (1986)

5.1.1 Playing skills of an elite player in offence

1. Scoring skills
 - Shoots quickly from the movement
 - Supporting actions (rebound, deflection, screen)
 - Playing towards the slot area with or without the puck

2. Skills to win space
 - Carry from small to big ice
 - Pass to an empty space
 - Offering a pass option for the offensive direction

3. Skills to control the puck
 - Moving puck protection
 - Cooperation with teammate by offering pass option sideways or backwards.

4. Transition skills from offence to defense
 - Creating offensive pressure by shooting outside the slot
 - Creating depth into the attack positioning under the play

5.1.2 Playing skills of an elite player in defense

1. Skills to prevent scoring
 - Shot blocking with stick or body

2. Skills to prevent opponent from winning space
 - Positioning on a defensive side
 - Angling from big to small ice
 - Body checking
 - Back checking towards the middle

3. Skills to regain possession of the puck
 - Stick checks
 - Body check
 - Winning the loose puck

4. Transition skills from defense to offence
 - Winning the loose puck
 - Positioning on defensive side (low triangle)

The theoretical framework of this thesis is to serve as a learning foundation for playing skills and the subjects related to the development of them.

6 Positional playing skills

Positional playing skills define a players' ability to play effectively their position assigned by the coach. Mastery of game-situations the player faces repeatedly during the game due to his playing position is very essential for the successful team play. We also have to understand the development of the game, while looking at the players' actions in different playing positions. During the early years of development, division of the roles between defensemen and forwards was simple: defenders defend and forwards attack. While the game has developed, positional playing roles have become closer to each other (Summanen & Westerlund 2000, 25).

Today all players must be able to play offense and defense in all game-situation roles, because to win the game-situations a player and his team must react and cooperate faster than the opponent. To be able to cooperate effectively the players must have common goals in different game-situations (Summanen & Westerlund 2000, 25).

“A number of the skills are specific to positions and should be stressed for those playing a particular position. For example, pinching by the defenseman should be practiced if you wish this tactic to be part of your team play” (Brithen, 2011).

Saarinen (2008) has studied changes in different game-situations in international games played by the Finnish national team between 1997- 2007. Some facts which support the idea of a focus on the positional playing skill development are: 1) Number of attack per team in a game has decreased from 160 to 120, 2) majority of the attacks begin from the defensive zone and 3) increasing the amount of attacks leading to goals begins from offensive zone (Saarinen 2008, 3).

What to these findings mean when relating them to the subject of this thesis? First of all there are fewer attacks and scoring chances in a game, scoring skills must be worked to get best out of the possibilities to score. E.g. forwards practice more shooting from direct skating closer to the net and defensemen work on point shots from the blueline. Secondly, if the most attacks begin from the defensive zone, there should be an emphasis in training towards the play-making skills of the defensemen, because they are

most likely the ones who will gain position in the defensive zone. Thirdly the quality of the offensive unit play (cooperation of defensemen and forwards) should be at least at the level that gets the puck into the offensive zone. When most attacks leading to a goal begin from the offensive zone forwards must have an excellent defensive and transition skills to regain possession deep in the opponent's end.

The playing position has an effect on the technical execution and visual observation required for decision making. Depending on the playing position (forward, defense, goalie) players will continuously face different kinds of situations, and so will need different tools to solve the problems, e.g. Hockey Canada (2008, 3) has set following positional skills criteria for the U17 national team defensemen and forwards.

Defensemen:

- Must be mobile and agile with good lateral movement
- Be able to contain players in 1on1 situations
- Must be a good positional player
- Must be able to read and react in order to move the puck quickly
- Must understand the team concept

Forwards:

- Must have excellent skating skills such as speed, quickness, agility, and strength
- Must be an intelligent player that understands offensive and defensive systems
- Must understand the team concept

When moving towards a more competitive level a team play system has more effect on the individual players. Certain skills might be valued more than the others due to the style and strategy of the team play. Some teams and coaches value more puck control skills, when some others focus more on defense and quick transition, aiming to be productive that way. To understand the value of the positional playing skills we must understand that team play objectives are always the same in a game no matter what kind of system the team is using. This fact should be taken into account in long-term

player development, because all positional playing skills are highly important to manage if we want to develop elite level players (Brithen, 2011).

The figure below illustrates the components which create /affect the positional playing skills.

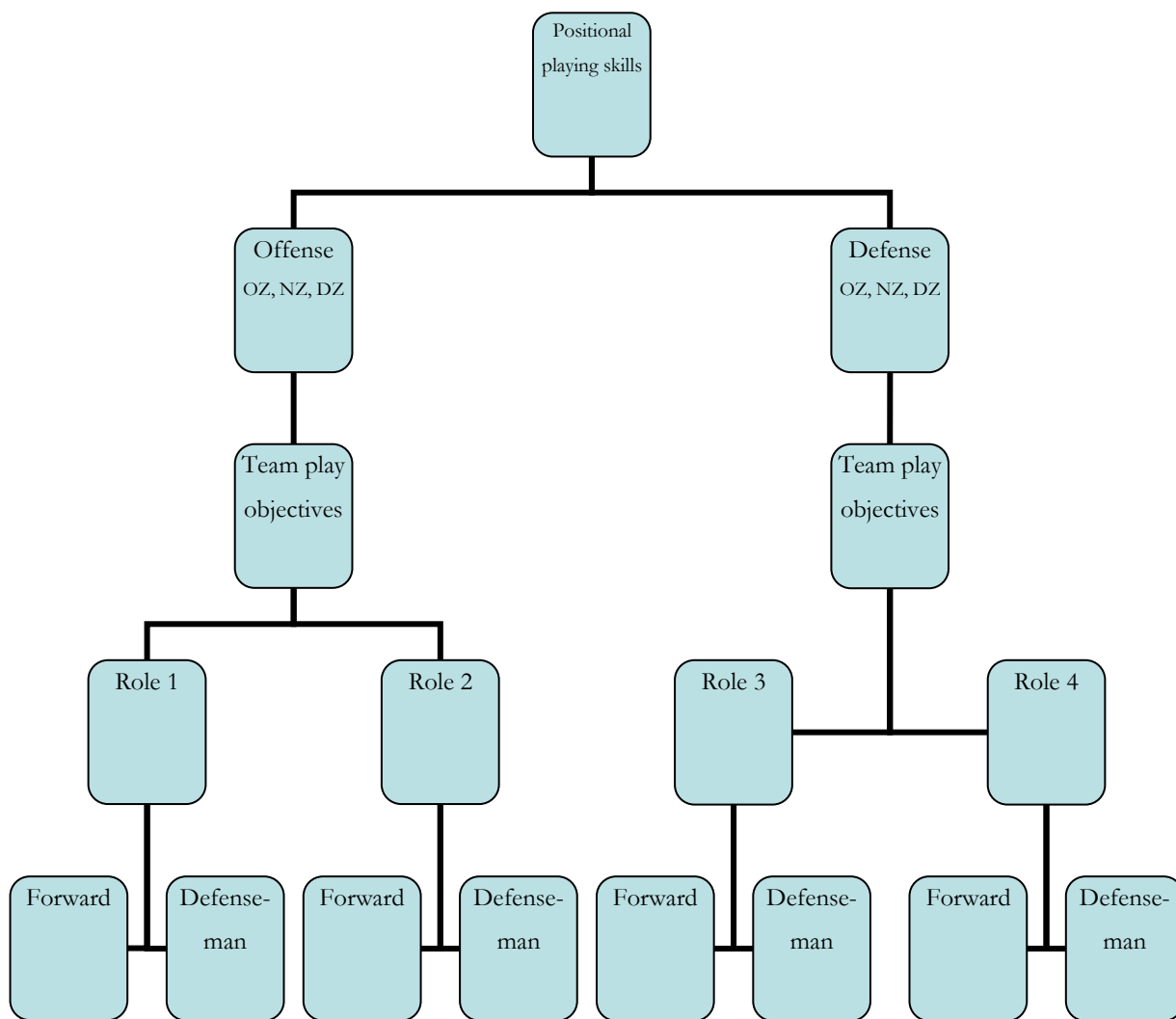


Figure7. Components of positional playing skills

The figure above is made based on the research findings during this thesis project. The positional playing skills in the different game-situation roles presented in the video material of this thesis are listed in Appendix1, and illustrated in the video material produced.

7 Teaching positional playing skills

A game-like setting or mindset plays a key role in the training process. A player must understand how the skill trained relates to the game, and have the understanding and skills to play together as pair, trio, and team.

The hockey of today requires the player to have good physical abilities, good skills and mental abilities, but most importantly all the players must have the ability to think in cooperation with other players on the team (Westerlund & Hockey Canada 1995, 2).

To be able to develop better players a coach has to make sure his players are learning through the coaching process over time. To keep track of development the coach must know what learning is and how people learn. Learning, according to Schunk (2007, 3), is an enduring change in behavior or in the capacity to behave in a given fashion, which results from practice or other forms of experience.

Learning is always a cognitive process. Cognition is the ability to store and use information for thinking, visualizing, problem solving, decision making and communication (Vickers, J.N 2007, 2).

In the coaching process it is essential to use all the available time as effectively as possible (Wooden 2005, 155). By studying the learning process the coach is able to plan quality practice sessions, weeks, months, and through them a successful season. Most learning theories, regardless of perspective, share some common instructional principles (Schunk 2007, 19). This is very important information for the coaches, when developing positional playing skills due to the complex nature of them. Most common instructional principles taken into account are:

- Learners progress through stages/phases
- Material should be organized and presented in small steps
- Learners require practice, feedback, and review
- Social models facilitate learning and motivation
- Motivational and contextual factors influence learning

Based on the instructional principles presented by Schunk, the following teaching progression for the development of the positional playing skills was formed.

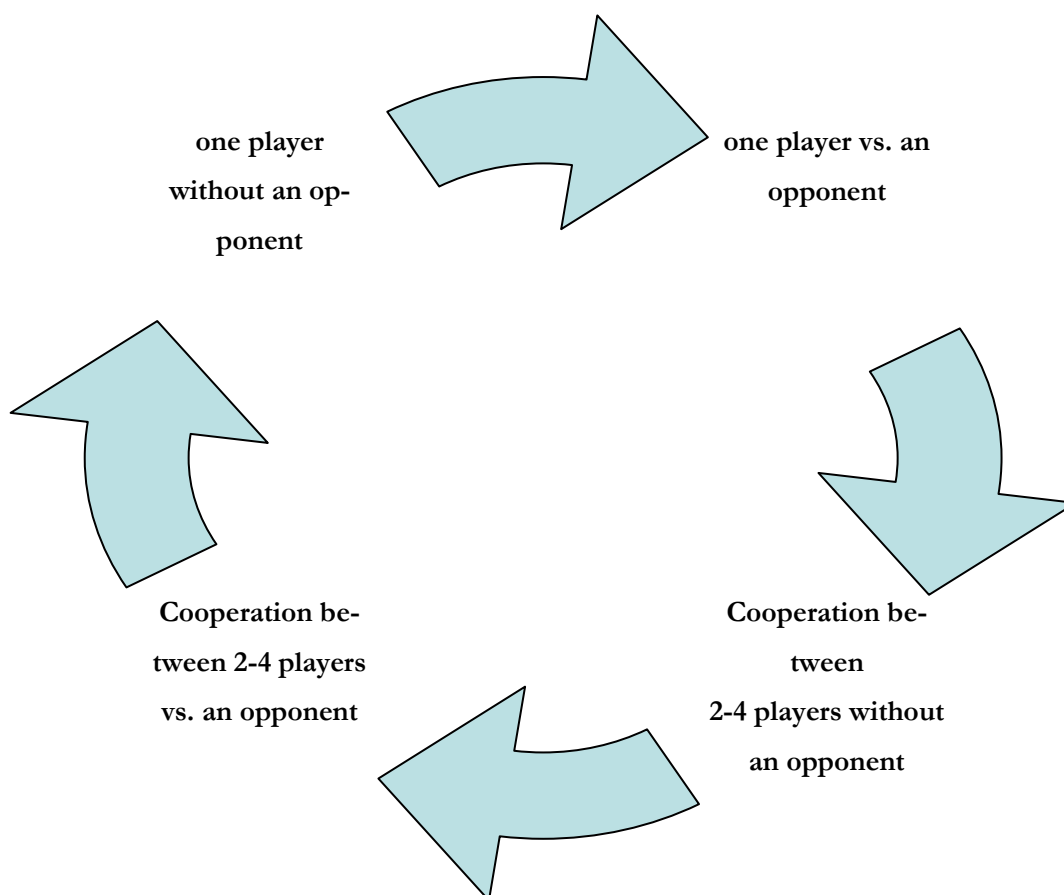


Figure8. Teaching progression of positional playing skills

To advance progressively, the on-ice drills of this thesis were planned to begin with the skills of a single player without the opponent. The idea of this is to give the player a picture of a particular skill's related to the game-situation and the player's position. In the second phase an opponent is added to limit the time and the space to make training more game-like. In the third phase, especially in the drills to improve offensive skills cooperation with the other players is highly valued because of the timing of actions and understanding of the different game-situation roles. In the fourth and final phase cooperation must be done against an opponent to promote more decision making skills.

To understand the role of hockey sense in the development of positional playing skills we must look at the factors which affect the reading of the game and decision making. First of all, reading the game requires visuomotor coordination, which is the ability to react appropriately on actions seen during the play (Vickers, J.N 2007, 1).

Secondly, training should include lots of decision making e.g. should a player with the puck pass immediately when he gets the puck or should he win space by carrying and then passing to an open player? Decision making is an ability to make the best choice between set of a alternatives (Vickers, J.N 2007, 167).

To improve decision making abilities in sports a training method called “decision-training” should be used.

When a decision-training approach is used, the same emphasis is placed on technical and physiological training, but the cognitive skills underlying higher levels of performance are trained at the same time. Instead of using simple to complex drills tactical whole training is used where skills are trained within tactically oriented drills that stimulate parts of the game (Vickers, J.N 2007, 164).

Based on all the aspects presented in this chapter, the following subjects must be taken into account when planning, running and evaluating the teaching process of the positional playing skills.

- Game-like drills
- Cooperation of players
- Learning process
- Time management
- Visuomotor coordination
- Decision training

8 Empirical work

8.1 Project planning

My interest towards positional playing skills came up around October 2008, when I chatted at the rink with my club's former Director of Hockey Operations and NHL-scout Jukka Holtari about my players in Espoo Blues C-juniors (U16). Jukka asked me a question; what are the most important playing skills coaches in our junior teams should teach the players on the way up to a SM-Liiga team? I remember not having clear answer, but I got great guidance from him based on the qualities that he evaluates when scouting a player. The subject interested me a lot because I was really keen to be better at my profession as a coach. As a junior coach my number one job is to try to help the players to reach their full potential and their dreams to becoming professional hockey player.

Next step was to discuss with the chief of coaching for Blues, Mika Marttila and Lauri Marjamäki. Marjamäki was then an assistant coach of Espoo Blues in Finnish Elite league and the Finnish U20 National team. These discussions helped make positive progress of this thesis. Mika gave me material he used to evaluate the players and Lauri gave his wisdom, enthusiasm and all the game DVD's from their games during the 2008-2009 season. I spent the following summer watching those games and taking video clips from the most common situations faced by players in different positions during the games.

At first the purpose was to use video clips with my own players, but when I got further I asked Director of Degree Programme Kari Savolainen and Mika Saarinen, the Director of IIHCE (International Ice Hockey Centre of Excellence) if it was possible to do my thesis based on the video material I had collected.

Mika and Kari gave the green light for my idea and promised their help. Like in all productive theses's, illustrative material must be backed up by theoretical facts. I started to search for data about the positional playing skills, which became the hardest part of the project, because there wasn't much earlier research on this subject.

The final step of the project was to plan and film drills which can be used to develop positional playing skills on ice. This was done in cooperation with the International Ice Hockey Centre of Excellence, located at the Sports Institute of Finland in Vierumäki. The IIHCE's Director of Development Tuomo Kärki became my mentor for planning and filming of the on ice drills. I spent an endless amount of hours in meetings with Tuomo over two years to create top quality material from the subject that was never really worked on before. Without Tuomo this thesis would probably have never been finished. For filming the drills, we used top level A and B junior players from my club Espoo Blues to demonstrate the on ice execution of the skills and drills.

8.2 Project implementation

The first phase was to take video clips from games of the Blues elite league team played during the 2008-2009 season. Data collection was done with the Steva Hockey video editing program. I divided and edited the clips into the four categories. The categories were: forwards playing skills in offence and defence, and defensemen's playing skills in offence and defence. Second phase was to sell my idea to Kari Savolainen, Mika Saarinen, and Tuomo Kärki. They accepted my project as being suitable for a thesis and I set up a simple plan of how I could build the whole project within available time frame.

It was important to create a daily schedule, because I had much work to do in my job every day. When I got my daily schedule figured out I began to collect sources and data the according to guidance I got from Kari and Mika in our meeting at Vierumäki.

Writing a theory part began with placing different categories in order to make the structure of thesis simple to understand. After the theory made sense for me, I planned drills for filming according to the theoretical framework.

I began collecting data about the technical and tactical domains of hockey from the materials we got and used in Vierumäki during the intensive studies: also books, the

internet, and my own data bank I have collected over the years of playing and coaching hockey.

Writing the theory began with the introduction and the overall picture about the qualities needed to be or to become an elite player. The purpose was to open up my subject for readers and for myself as well. I decided to introduce the technical aspects related to the playing skills first because that is where the player development begins in my mind, and then moved into the hockey sense. Together those create the playing skills which were introduced after the foundation was laid. The final phase of the theory was make a practical teaching progression of the positional playing skills before planning the drills and setting up filming dates.

8.3 Product description

The final product is a complete drill bank to develop the positional playing skills in all four game-situations in the offensive, neutral and defensive zones of the rink. The drill bank will be available at the Hockey Centre website managed by the IIHCE. All seventy drills give a practical example of how the positional playing skills can be developed in a real practice setting with junior players who are aiming at the elite level in the future where those skills must be mastered.

9 Discussion

The aim of this thesis is to prove the importance of the positional playing skills in ice hockey. In my own philosophy of player's development everything looked very simple, but the greatest challenge was to find scientifically proven support for my idea. What I found out during the project was that there was some research made about the game-situation roles and the skills inside of them. All data I found always led into the game-situation roles, but never to the positional playing skills inside of them. Even collecting of proven data was quite difficult, good thing was that I was doing some pioneer work in this field, and hopefully this will thesis project will open eyes and bring something new for the player development especially at the junior level. By the end of writing the theory part I believe I got together valuable information about teaching, in terms of what factors make a difference in teaching, learning and development, e.g. the importance of the decision training.

For future research I would suggest that someone continue my work in the field of positional playing skill development by analysing elite level games and counting different actions done by players in different positions and game-situation roles e.g. how many times defenseman wins space by combination of carry and pass, or how many times the center offers a pass option in the middle in a game. This kind of research came to my mind many times during the process, but I just didn't have time and energy to start doing it!

I personally believe that the positional playing skills are very important for the player development if we want to produce quality players, and so for increase the level of the game itself.

Production part was easier to do because I had an everyday possibility to test the different drills and methods with my own team and get feedback from them. Challenge in the progression described in theory part and used in productive part is to find suitable drills to fit for the players' technical capacity and hockey sense, so the transfer from the practice to the game can effectively happen. This kind of method is simple but if the technical execution without an opponent is not carefully instructed and demanded the drills may easily become technical skill drills with game-like setting. Time, space and

correct technical execution of the particular skill must be carefully accounted for to get positive development. An opponent must be added to the training as soon as the technical execution is at level a player understands how the skill used relates to the game. Training against an opponent and with decision making also motivates the players to work harder, and most importantly, increases their interest to know more about the game when they continuously have to be alert by reading the game and making accurate decisions.

The use of video material is very beneficial for the coach when planning practices, and I hope an outcome of this project will be helpful for many. I found that use of the video really helps in finding out the key points from each drills and gives more understanding of how to compose my on-ice practices. I also filmed few of our own practice sessions during the 2010-2011 season, when we used the same progression to develop the positional playing skills in my own team. From the video it is much easier to see the correct execution and quality of the training than from ice level where you are intensively coaching.

I think this thesis project reached its goal, because no matter what visions coaches and the others bring up, there will always be beforehand assigned positions in hockey and other invasion games. During the action, playing positions will get mixed, and they should if the cooperation between players is functioning in terms reading and reacting. It is still essential to master many skills in every position. Other invasion games such as rugby and soccer have already done the same kind of lists of skills to master in different positions. I can't see any reason why this could not be beneficial to hockey as well because all invasion games have the same ultimate goal, to score more points than the opponent and inside the game-situation roles.

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Attachments

Appendix1. Positional playing skills in different game-situation roles

Positional playing skills in different game-situation roles

Offense				Defense			
Forward		Defenseman		Forward		Defenseman	
Role 1	Role2	Role 1	Role2	Role3	Role4	Role3	Role4
Scoring				Prevent scoring			
shot from direct skating	Net drive	Shot from the carry	Offering pass option to the point	Shot blocking	Stick checking	Shot Blocking	Stick checking
Shot from diagonal skating	Rebounding	Shot from the point	Peaking into the slot	Taking away shooting angles	Taking away passing lanes into the slot	Taking away shooting angles	Taking away passing lanes into the slot
Shot after fake or delayed action	Re-direction	Delivery from the point	Joining the rush from behind				
Onetimer shot inside the slot	Screening the goalie						
Shot on a second touch							
Winning space				Regaining position of the puck			
Carry	Offering pass option to the	Carry from small to big space	Supporting the rush from behind	Stealing the puck or	Going first to loose puck	Going first to loose puck	Going first to loose puck
Give & go	offensive direction	Pass to offensive direction	Offering pass option to the offensive direction	creating loose puck by; Body contact, body or stick check	Taking away passing lanes	Stealing the puck or creating loose puck by;	Pass interception
Winning 1-1	Offering pass option to the empty space	Give & go	Give & go				
		Transfer / dump into empty space				Body contact, body or stick check	
		Deke on the point					
Creating space with puck control				Prevent winning space			
Puck protection on the move	Protecting puck by counter check	Puck protection on the move	Offering pass option to sideways or under	Angling from big to small space	Covering the middle ice	Angling from big to small space	Covering the middle
Controlling puck by moving towards bigger space	Offering pass option to sideways or under	Controlling puck by moving towards bigger space		Body checking	Marking own player on back-check	Playing tight gap on 1-1's	Going first to loose puck
Pass sideways or under		Pass sideways or under		Backchecking towards the middle		Body checking	Pass interception
Transition to play defense				Transition to play offense			
Creating offensive pressure by shooting outside of the slot	Creating cover on defensive side	Quick role change after opponents steal or loose puck	Creating depth in the attack by covering the rush	Quick role change after opponents steal or loose puck	Pinching in on the blueline	Quick role change after opponents steal or loose puck	
		(awareness of momentum)		(awareness of momentum)	Going first to loose puck		(awareness of momentum)