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A comparative study in floorball about the difference between small-sided games versus full-size game

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Abstract

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The thesis was a request from the Finnish Floorball Federation from the Game Development department. Even though studies in the field of floorball are growing, there has not been done a study about the small-sided games which as a tool for children and youth coaches is important. The small-sided games have been become more popular and acknowledged especially in the team sports and are used lot in floorball. The goal in this study is to examine can small-sided games support better children learning of sport specific skills. The goalkeepers data and results are not included.

Before able to teach a skill it is important to understand how skill can be tough, for this reason this thesis presents different learning pedagogy styles, TGFU-model and other research done about small-sided games.

Thesis started fall 2017 with the two local teams who participated in the study; players were born years 2007 and 2008. The teams played three games which different court sizes and where the amount of players was increased or decreased. The study is focused on the children results during the game, not the level of coaching, previous experience of small-sided games or skill difference between teams. All the games were recorded with two cameras and data was collected by tagging games afterwards with MyCoazh- tagging program. Tagging, analyzing and literature research was done fall 2018. The thesis was done in co-operation with following organizations; the Finnish Floorball Federation, MyCoahz and Suomen Erotuomariklubi.

There are different factors examined for example overall actions, successful actions, the average for players ball touches, the difference between game types when focused on max and low ball touches at the individual level and percentage for shooting, dribbling, passing et cetera. From the results can be seen that small-sided games for example are beneficial when wanting to practice shooting, dribbling or 1vs1 situations. However for passing a full size court game could be more recommended.

Keywords
Floorball, small-sided games, sport specific skills.

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1. Introduction

Floorball as a sport is breaking the glass ceiling with influence, events and growing space. Excellent example is the upcoming men's Championships 2020 which will be the biggest worldwide sport event of the year (Finnish Floorball Federation, 2018).

Before Finnish coaching was faced with a challenge when team sport athletes were in good physical shape and had the needed skills however discovered that game sense had not developed as hoped. Drill culture was so strong that it was forgotten how important game sense as in observation skills, quick decision making and game understanding was. Nowadays it could be pointed that individual technical skill and game sense are two respected and valued player characteristics.

After this small-sided games have found out their place to almost every coach gamebook and have become very popular between coaches and players. In floorball it is also largely used however there has not been done any research specifically about inside this sport. The topic interest's the author personally and also the Finnish Floorball Federation wanted concreate research about this. This thesis could be seen as a guideline how to use different game types to improve skills and what kind of teaching styles could have more impact.

Learning a skill is a complex and individual process which is presented in this work to give more depth to the reader knowledge and why it is important to know the fundamentals of it. Coaches for example face different environments, resources, group sizes and clubs and despite the challenges or surprises, are expected to improve the players during every practise session. Also because the thesis's demonstration teams are children, children motoric skills importance is viewed and the connection to sport specific skills.

Two different types of pedagogy approaches are introduced, -could be called more traditional- style which is linear pedagogy and more modern style which is non-linear pedagogy. Also teaching game for understanding (TGFU-model) is made familiar because it can be used either full size game or small-sided games.

The goal of this research is to examine on the differences between small-sided game vs full size game. The research field was narrowed with the purpose to discover are small-sided games better when learning sport specific technical skills.

2. Floorball as a sport

2.1 Floorball history

The first touch of “sähly” - the non-professional game form of floorball- was done in Finland in the University of Helsinki in the year 1974 (Kulju, Sundqvist, 2002). In general it is known that students brought the sport from Sweden and started to play it first as a university activity. The sport became popular with high speed within children and students because it doesn’t require lot of equipment (usually sports shoes and stick) and the rules easy.

In particular Viinikainen, 2011 presents that field hockey was one of the sport’s that influenced the early stages of floorball’s development and in the 1960s century a sport for children was launched as a “floorhockey” or “polyhockey” . Furthermore there is a theory that Swedish students could gotten the idea from equipment from Holland; balls which had 26 holes and sticks with curved blades which were actually field hockey equipment (Laamanen, 2015, p.9; Wickström, 2005, p.11). Rules for floorball were developed based on ice hockey and rinkball because of the fast increase of the players (Kulju & Sundqvist, 2002, p. 36-37; Korsman & Mustonen, 2011, p.15-16).

First floorball club Sala IBK was founded in Sweden 1979. Two years later in 1981 Swedish Floorball Federation was founded and the Finnish Floorball Federation four years after that. After this first guidelines for the sport were drawn by making rules and standardizing the court and goals size. First SM-league in Finland was played during 1986 – 1987 with ten teams for men and for the women the time came one year later with seven teams (Järvinen &Sipilä 1997,p. 7; Korsman & Mustonen, 2011, p.16).

It is interesting to learn how sport became to be called. Salibandyn juhlalehti (Floorball Anniversary Magazine), 2005 has recorded that Swedish translations “innebandy” evolved to “salibandy” wanting to sound more like a modern sport. The new name was one important point standing out from other sports.

The International Floorball Federation (IFF) was founded 12th of April year 1986 in Sweden by three floorball associations Finland, Sweden and Switzerland (International Floorball Federation, 2018).

2.2 Rules

The International Floorball Federation, 2018, describes floorball in the Rulebook for Referees as “Skilful game with physical element...” which is very accurate.

The court standards are 40meters x 20 meters large rectangle area. The rink has rounded corners and is proved by International Floorball Federation. The floor material is usually parquet or synthetic mat material (Korsman & Mustonen, 2011, p. 21). However there is a difference between goal area and goalie area. The goal area size as rectangle is 4m x 5m and players are allowed to enter there. Also the goalkeeper can use the area his/hers advantage when throwing the ball, with the restriction that at least one foot touches the area all times. The goalie area – also as rectangle- is only for the goalkeepers and 1 x 2,5m and it is not even allowed to run through the area.

Men’s and women’s SM-league has game time as 3 x 20min which includes two 10-minutes intermission and the game time is effective (Korsman & Mustonen, 2011, p. 21; International Floorball Federation, 2018, p. 9). Thus the game clock is stopped for every pause which happens during the game.

If the ball would bounce outside of the playing are or there would be a foul in the game, there are few different ways how to continue the game. One of them is the face- off, meaning one player from both of the teams takes part. The setting is the same way as when starting the match, switching a period or after a goal is scored. In detail the blades are straight beside the ball and referee usually continues the game with this approach when for example the situation is unclear or the ball has broken. Free hit is used when the opponent has conducted a foul in the game. The placement is from where the foul happened however the referee has an option to use “advantage” which means the game can continue if it benefits the attacking team in the situation instead of stopping the game. Lastly the hit in is used if the ball goes over the court from a player or a goalkeeper. For example if the ball has gone over from a player which represents team red, blue team has a hit in from the nearest corner sport (Korsman & Mustonen, 2011, p. 22-23).

Lastly the regulations what is allowed to do the stick is very strict for example pushing, hitting with it, picking up or playing between opponents legs is against the rules (Korsman & Mustonen, 2011, p. 96).

For different age categories there are different rulebooks that Finnish Floorball Federation has put together because children and adults naturally have for example different goals.

For the adults usually it is more competitive result which is worked for in the game and in the contrast for the children the joy of the game is more important. Typically the rulebooks divided for different categories.

20§ Junioreiden sarjat ja ikäluokat

Junioreiden sarjat ja ikäluokat ovat;

Pojat:
A-juniorit (SM-sarja ja 1. divisioona), johon kuuluvat vuosina 1998–2000 syntyneet pelaajat
B-juniorit (SM-sarja ja 1. divisioona), johon kuuluvat vuosina 2001–2002 syntyneet pelaajat
C1-juniorit (SM-sarja ja 1. divisioona), johon kuuluvat vuonna 2003 syntyneet pelaajat
C2-juniorit, johon kuuluvat vuonna 2004 syntyneet pelaajat
D1-juniorit, johon kuuluvat vuonna 2005 syntyneet pelaajat
D2-juniorit, johon kuuluvat vuonna 2006 syntyneet pelaajat
E1-juniorit, johon kuuluvat vuonna 2007 syntyneet pelaajat
E2-juniorit, johon kuuluvat vuonna 2008 syntyneet pelaajat
F1-juniorit, johon kuuluvat vuonna 2009 syntyneet pelaajat
F2-juniorit, johon kuuluvat vuonna 2010 syntyneet pelaajat
G-juniorit, johon kuuluvat vuonna 2011 tai myöhemmin syntyneet pelaajat

Table 1. Junior's categories depending of the year of birth, boys. (SSBL, 2019, kilpailusäännöt, part 20).

Because the children who are used as demonstration teams are born in the year 2007 and 2008 they belong to categories E1 or E2 as can be examined in the Table 1. As a result the two teams follow the rulebook called PeliMaailma where the rules are designed to be more flexible that it could give the opportunity to develop children at the level that they feel comfortable. The rules want to highlight the development aspect rather than the competitive side (PeliMaailman säännöt, 2018, p. 2).

2.3 Current state in Finland and worldwide

Floorball as a sport has been developing with rapid speed within last 20 years and for the sport, the dream is to be one of the official Olympic sports in the Summer Olympics in the future. An important moment was when floorball was one of the sports in the World Games 2017 at Wroclaw, Poland (The Finnish Floorball Federation, 2017). The upcoming World Games at Birmingham, USA 2021 have published the sports which are participating and floorball is one of them (The World Games, 2018).

Playing floorball as a profession is not yet recognized in Finland even though the sport is generally very popular and increases its player amount almost every year. Usually the players have a typical day job and floorball even in the SM-league –and being more athletic constantly- is still seen a hobby. The situation is different in Switzerland and Czech Republic where it is known that some Finnish floorball players have went and played as a profession. It could be said that floorball is recognised as a semi-professional sport in the top four countries meaning Finland, Sweden, Czech Republic and Switzerland.

The Finnish Floorball Federation has stated its 2028 strategy and vision which have two

main points. One being by 2028 floorball would be the most popular team sport by licensed players and Finland would be the best floorball country in the world (Finnish Floorball Federation, 2018). The Federation has divided Finland in seven operational areas. Every area has its own area representative which provides the competitive structure for the area and manages the bookings of the sport halls for the official games. This is necessary because of the amount of players and competitive leagues played within areas needs a person to supervise and organise the administrative details. The sport has 22 clubs in Tähtiseura (Star club) program which is done in cooperation with National Olympic Committee, Sport Federations and clubs which fill the criteria's (National Olympic Committee, 2018). Tähtiseura (Star club) program is given to a club which can offer quality training for every member from a child to adult, there are three different categories that club can be part of.

The sport has different exciting variations which usually held as a tournament. For example there are tournaments for street-, sand-, lake-, snow- and swamp floorball. Considering the amount of the variations the sport has and the Finnish Floorball Federation's slogan "Love the way you play", it could be argued that there is a link between the innovation and passion within the sport.

Nowadays floorball could be considered a popular sport nationwide in Finland, in almost every age-category, in school and in work. It has been recorded that floorball increases better work environment and physical condition as well as overall activity (Korsman & Mustonen, 2011). Reasons why the sport is so popular is that is considered not expensive, easy to start and learn. Also for special groups –people who are in wheelchairs or deaf- have their own leagues (Viinikainen, 2011).

The International Floorball Federation, 2018 recorded 354 640 players at the end of 2017 which was an 11% increase compared to 2016 and 68 member associations. International Floorball Federation (IFF) Champions Cup is an international event which is held every year and the general opinion is that it is an important place where the national teams test players and strategies. Currently it has been determined that Finland, Sweden, Czech Republic and Switzerland are the four European countries that take part in the tournament which means there are four women's teams and four men's teams. From these countries the national winners are have an invitation for the tournament automatically. If the team does not want to take part (for example because financial reasons) the second best is given the spot.

The Champions Cup could be slightly criticized because of the ranking system thus the ranking system goes hand in hand with nationwide results. The present tournament system is the most cost efficient however at the same time it is a reflection for the countries places 5th-8th about challenges around hosting this scale of a tournament. Also a question can be raised as does this kind of structure between the Champions Cup and EuroFloorball Cup make the skill gap larger between for example 3-th4th place and 5th-8th places when focused on national teams level. Before, the design was that six countries took part in the tournament which made it possible that the “weaker” countries could test their skill level against top countries. Nowadays ranking place 5th till 8th place play only in the EuroFloorball Cup.

World Championships are played every year, in even years for Men and U19 Women and in odd years for Women and U19 Men (International Floorball Federation, 2018). The next World Championships for men are played this year 2018 in December, in Prague, Czech Republic. Year 2020 is a very important “milestone” for Finnish floorball when World Championships are held in Finland. Twice before, these games have been constructed in Finland, year 2002 when Finland came second and year 2010 when Finland won. It is broadly felt that people are expecting another gold medal already from Prague and especially from the home games.

3. Learning a skill

“Learning is very complex phenomenon and it is hard to notice. Making it more complicated is that learning and training happens at the same time.” (Kalaja & Jaakkola, 2015, p.197). In general the mind-set about learning has evolved with high speed, from a student who will just passively absorbs information from a teacher or a coach to a concept of an individual whose learning is influenced different by factors. Three main factors are the learner, learning environment and the task at hand to be learned. If focused on a sport skill the learner’s characteristics, physical attributes, motivation and beforehand knowledge affect the learning process. Learning environment might have a positive affect if there are loved family members rooting or negative if there is a rivalry team booing. Learner’s characteristics might affect for example how strong the grit is when an athlete tries a movement before he/she can perform it as imagined. The knowledge could appear as game sense for a player; he or she knows where it is beneficial to pass without opponent taking the ball.

After learning a skill the athlete is able to perform it in a new environment, have more consistency and improve in the future. The more a skill is practiced there more the performance has similarities however they are not identical. Learning happens both conscious - an athlete trying and analysing a movement - and at unaware state - through central nervous system (CNS) (Kalaja & Jaakkola, 2015, p. 197).

3.1 10-11 years old learning abilities

In general floorball has had the “second sport” idea which has its beneficial and harmful side. If focusing on the beneficial side, usually the child has two or three hobbies. The importance behind this is the versatile training through many activities which increases the base which is highlighted when learning motoric skills. Kalaja and Jaakkola, 2015, p.194 highlight the importance of motor skills by “Learning basic motor skills meaning balance- , moving- and handling an equipment skills is crucial for learning sport specific skills in the future”.

The nerve nets inside children brains are developed by versatile sports experiences which could help in the future to learn some sport specific skills. Also other important factor is that if the motoric skills level is weak and the physical abilities are strong this could lead to higher injury risk (Kalaja & Jaakkola, 2015 p. 194). In general this topic has increased its interest due to the injuries that has occurred within the young athletes in Finland.

When a child is introduced into a sport environment, it is crucial that mentality behind the instructing or coaching is to support and wake up the within motivation. Supportive environment where it is safe to learn, work together, experience trial and error and start to notice the development – is needed that the child has the motivation to train in the future.

Motoric skills can not be compared for a skill that you learn once, giving an example; when you grasp the idea how to ride a bike. First you struggle however when you understand the principle you are usually able to use this skill throughout lifetime. Motoric skills development takes significant amount of time when a child learns different sport skills. It is a process where at the same time the child's muscular and nervous system grows. Different aspects influence the development for example, biological age, genetics, details in physical and psychical attributes and social environment (Jaakkola & Kalaja, 2015 p. 195).

There are five stages in when child's motoric skills are being developed. First stage covers approximately the age from infant to one year old. This stage contains the primal reflexes. The second stage is approximately from one to two years old when the fundamental motor skills start to develop for example the child tries running, jumping and throwing. The third stage is from age two to seven years old and contains learning a large amount of the motor skills which are variety of balance-, moving-, and equipment handling skills. This builds up the base for later when learning sport specific skills. The fourth stage starts from 7 years old and continues to 15 years old. This is the time when children start showing interest of sports and learning sport specific skills. Without motoric skills it could be argued that learning sport specific skills is impossible. The last, fifth stage starts around when a person is 15 years old and last through lifetime (Jaakkola & Kalaja, 2015 p. 195-197.

3.2 Sport specific skills

Control of the ball is seen as one of the sport specific skills. It gives the base on other skills because controlling the ball the way as imagined is what players' aim for. Nowadays players have better understanding of the importance of control of the ball and practise more on their own free time because this skill needs a lot of repetitions. Good game stance improves the ball control. Few of the key aspects of good game stance is having the weight on the palm of the foot and keeping head up. Likewise the good ball control includes good game stance and soft feel to the ball (Korsman & Mustonen, 2011).

Moving with the ball "kuljettaminen" contains many aspects. Usually it is used when wanting to create space and time for your team to pass or to shoot. Moving with the ball needs

technical skills and game sense to read where it is the most beneficial to move with the ball. One useful detail is if the player knows how to protect the ball at the same time when moving on the court it is almost impossible to take the ball without breaking the rules. Some important details to successfully move to ball are the possibility to pass from left or right side, possibility to protect the ball and keeping the head up (Korsman & Mustonen, 2011, p. 8).

There are different passing techniques which are wrist pass, escort wrist pass, passing right hand side or curve ball. Passing is one of the important aspects in the game because it is common knowledge that if you want to speed up the game tempo, the ball moves much faster than the players can run. With the passing the goal is to find a player who could shoot after receiving the pass as a result the opponent tries to take the ball away. For example passing sequences are difficult to defend if there is not indication where the ball is going next. In general fast passes in front of the goalie are also popular because ball moves faster side to side than a goalie which usually leads to goal. A successful pass is a combination off rightly chosen pass technique, timing, accuracy and game sense. A good advice is to give the pass little bit upfront instead too behind, especially if the player is running (Korsman & Mustonen, 2011, p. 87).

Shooting has two aspects that affect its result, which are the distance from the goal and the angle of the shot. Behind every shot is the desire to make a goal and the most efficient one is one timer, meaning right from the pass you shoot. Some teams prefer the mind-set where you try to shoot as much as possible form places which are not the best and some try to construct the game that you get to the best shooting sectors. A wrist shot might be the most popular shot used in floorball because it is fast and accurate.

Slapshot might be the most preferable from straight pass. It is one of the hardest shots but it also the most inaccurate one. (Korsman & Mustonen, 2011, p. 93). Slapshot straight from a pass is used very often in power play when the team with tries to move or break the defence. However not every shot means straight away goal, sometimes there is a re-bound ball which is still playable near the goal. Here again the personal ball control comes as an important factor can the player hit the ball from a small bounce. The last style mak-ing goals which has been rising from year 2010 is making a goal from a bouncing ball and hitting it using the stick likewise a bat. However it is good to keep in mind that that it is not allowed to play the ball above the knee level.

1vs1 in floorball is different compared to other sports for example football or ice hockey which are contact sports. In floorball it is allowed to make contact shoulder against

shoulder which is especially used in corner situation and during running with the opponent towards the ball. Slight push is allowed with the shoulder to take off the balance of the opponent however what is allowed to do with stick is very strict (Korsmanen & Mustonen, 2011, p.96).

4. Small sided-games

Small sided-games might help athletes who are in good physical shape and have required needed skills however can not read the game or make required observations to give advantage to their team. Iivonen, 2015, explains that the level of training to improve the physical attributes and sport specific skills have been very strong focus point for coaches in Finland working with children and juniors; however this has raised challenge mentioned earlier. Nowadays it is understood how crucial it is to develop game sense and overall observation skills. For example one aspect of observation is spatial perception; with good spatial perception a person can understand how much space is between players and how to use the space available to advantage in the game. This skill is very important in any team sport and it is important to highlight that it is a skill that can be trained. For example small sided-games give a good opportunity to develop game sense because the requirement is to observe and make quick decisions. It could be said that the next level of observation is when the child has good game reading ability and he/she knows what information is relevant and vice versa (Iivonen, 2015, p. 325).

4.1 Research

In football the term small sided-games (SSGs) have been defined by Rampinini et al., 2007 as exercises where players' amount is reduced and the field is smaller when compared to normal standards.

There are a large number of variations how it is possible to modify small-sided game for a specific team or player's needs. Rampinini et al., 2007 highlights in soccer that it is crucial to change the amount of the players when SSGs variations are applied. Similarly this argument could be used in floorball. Even though the court is smaller the game aspects remain the same. Familiar situations that the player would face in a basic game are also in the small-sided games; only the reaction time and space in general would be faster. Different variations could be made by changing rules or reducing the court size.

It is generally believed that small sided-games have been growing popular within coaches. It could be argued that small-sided games are an excellent way to teach how to handle pressure in game situation, how to create and fill space, how to read and react in the game. Especially if the coach would want to teach how to play more physical game, the small-sided games are great way to do that. In general when wanting to improve endurance and physical condition coaches use small-sided games and when normal amount of players is used coaches look for more tactical aspect. These exercises are also popular

among the players which could be explained since every player has the opportunity to increase ball touches and have more often game-like situations and makes it more enjoyable (Capranica et al., 2001).

Sports are not a simple environment where a player has to make decisions. Thus is the reason why a coach has to understand to make the task or problem easy enough that the player is able to solve it. This could be one of the reasons why small-sided games are such popular tool. “There is a trend in team sports to move to smaller sided games, since this not only reduces the number of problems that have to be solved, but also increases the opportunity to solve them (Abraham et al., 2015, 30; Richards, Collin & Mascarenhas, 2012).

In the author’s opinion every practice session should include one small-sided game. It could be used as a way to warm-up players and goalies without doing usual ball warm-up. And when considering small children it is an excellent way to let out the extra energy at start of the practice that children can concentrate better on the learning part.

One study in soccer (Platt et al., 2001) focused on different skills pace and type in small-sided games with young players. The study demonstrates that in a three-a-side games compared to five-a-side games, players had more possibilities to perform and improve their skills being shooting, passing and dribbling. USA Hockey conducted a study where children under 8-years old played on normal size ice and also small-sided game which was cross-ice size. The outcome was excellent, small-sided games showed double increase in puck-touches and shots per player (USA Hockey, 2015).

Another important factor that McCormick, 2012 studied was the player’s enjoyment. Results demonstrate that small-sided games have the same amount or higher compared the standard court size.

When taking into account the physical aspect, a study in soccer demonstrates that when involving fewer players in the exercise, the heart rate will increase. One explanation for this could be that when there are fewer players in the game, it forces them to be more active. Small-sided games are excellent way to make children move and run more, since the game aspects are forcing this without players noticing it (Michailidis, 2013).

A large amount of research agrees on the argument that small-sided games are an efficient way when focusing on technical skills. Katis & Kellis, 2009 research of small-sided games in football shows increase in tackles, dribbling, passes and goals. Similarly a study

conducted in basketball shows that players in 2vs2 game had a 60% higher technical element than compared to a 4vs4 game.

4.2 Teaching games for understanding (TGFU-model)

This model focuses on understanding, analysing the game and teaching the players to observe the game performance and recognizing the weaknesses on the technical or the tactical side. The analysing happens in the form of questions about the game and if this model is used the first time it would be recommended that the coach has the questions prepared while he/she has observer the game part. For example the players can point out after a question “why did not the game part work” that the passes did not reach other players and as a result the next drill would focus on improving the passing technique. The players can now understand why this skill needs practise and can see clearly how it affects the game performance which could act as a motivation. The main idea in this model is that drills, practices and overall themes can be justifiable and the athletes learn to use these skills as advantage in the game environment (Korsman&Mustonen, 2011, p. 113).

The more traditional style focuses that the athlete is be able to perform a skill before going more depth in tactics. For example a training session would be organised that the team would first practise some sport specific skill and then later on play. This kind of coaching model and organising a practise has raised the problem where instead using the skills in the game environment as hoped, the skills do not transform to benefit the player. Also it could be argued that if the athlete does not understand why some skills are being practiced there could be lack of motivation and repetitions are done quite mechanically (Korsman&Mustonen, 2011, p. 112).

4.3 Non-linear learning

Before it was believed that learned/saved models inside of us controlled the movement sequences however in non-linear learning pedagogy the approach is that every performance is of a kind and the saved perception of the movement does not strictly control the implementation. In non-linear learning it is strongly believed the individual moves with individual style and skill learning is adjusted to the athlete needs and abilities. It is believed that there is different ways to reach a goal and the same technique that did work for person A may not work for person B. Even in individual sports that have strict performance requirements for example ice-skating it is possible show individuality (Kalaja, 2017).

This kind of learning also agrees with the idea that the practicing environment has to be similar with game environment, thus in the game situation it would be then possible to give out a good performance.

One crucial notice is that learning does not improve like straight line since the amount of repetitions does not automatically predict improving. Even though there is a connection between a skill and repetitions, it is hard to predict what the needed amount is for an individual. Learning could be described in general more as a curve than a straight line. Through non-linear learning the key is to find the best approach for the athlete, the task and the environment.

Observation skills and senses a needed for the athlete to gather information is very important concept in non-linear learning. Kalaja, 2017 describes well “Without information the movement can not be functional and in the other hand observation requires movement”. A good example is defense player who tries to block a shot, the player needs to concentrate and observe where the ball is coming that he/she knows where how to accurately move. Interesting viewpoint in this way of learning is how feedback is examined; instead using the term feedback it is preferred to use information. Theory behind this is that term “feedback” might be seen as something in the past when in non-linear pedagogy the aim is to go forward and gives information to the athletes (Kalaja, 2017).

Deci & Ryan, 2000 present the Self-Determination Theory (SDT) where the physiological well-ness and self-motivation requirements are as follows; capability, experienced autonomy and social relatedness. When learning is seen as an individual process it strengthens the factors that influence self-motivation.

3.4 Linear learning

The traditional skill teaching is also known as linear pedagogy. In this teaching environment the athlete tries to copy the demonstration that a coach has shown or a model example is given. Linear pedagogy is still nowadays used and within physical education teachers they tend to mix these two learning styles together. This is well understandable when a teacher would have for example 20 children on class and the theme would be learning a skill – a forward roll. With this teaching style there are lot of verbal instructions and a movement or a performance is spilt into parts which then are practiced. An instruction how a movement is done is provided and afterwards verbal feedback is given.

When the same structure is transferred to a coaching session where a skill is trained Ruottinen, 2017 raises a common problem “Coaches give feedback about the key points and quality factors and afterwards everybody wonders, why the skill do not transfer into the competitive situation”.

Even though coaches have seen results and some players enjoy this approach there are players who can struggle with this. Gray & Hall explain it as “In adopting this skills-first approach, games players can find it difficult to transfer their previously ´learned´ skills into the game. This is due to the fact that skills are practiced in isolation from the game context so players do not develop an understanding of the situations during the game that necessitate the application of such skills.” (Gray & Hall, 2015, 162).

Ruottinen, 2017 describes well the other side of this approach “The challenge in linear pedagogy is small amount of performing time, closed skill and to add up to everything, the operation is coach-centred”.

5. The aim of this study and the research questions

The overall viewpoint of the thesis is to focus on the differences between small-sided game vs full size game. The topic interests personally and is important when considering the discussion within junior coaches nationwide.

The aspect of ball touches is examined because it could be argued that the more the player touches the ball, the better the technical skills can improve. Also it could tell if the court size or player amount if modified does the activity increase or decrease.

The reason why shooting especially is highlighted in the research questions is because of the nature of sport itself. Floorball is goal scoring sport in which the team with most points wins. This makes especially this sport specific skill important, children enjoy making goals and can feel achievement and coaches see this one factor how a game can be won.

Specifically, the purpose of the research is to examine are small-sided games better when learning sport specific technical skills through the research questions. The research field was narrowed that the thesis would not be too large and could provide more depth about beneficial factors for sport specific.

5.1 Research questions;

- What kind of difference is there in ball touches when compared 5vs5 to small-sided games?
- What kind of difference is there in the amount of shots when compared 5vs5 to small-sided games?

6. Method

In advance the team's coaches were informed about the rules and the order of the games. First it was played the 5vs5 game on a big court second the 4vs4 and lastly 3vs3 on the smallest court. Size of the court for the 3vs3 game was 10 x 20 meters and in that game type was used the goal-decreasing-element (maalinpienennyselementti). One player had 67 square feet when considering how much space does one individual have when taking into account all usable space. In the 4vs4 the size of the court was 16 x 26 m and the "efficient" game time was 77% from 100%. For one player there was approximately 112 square feet of space. Lastly in the 5vs5 size of the court was 20 x 38m and square feet for one player were approximately 137.

Two teams in the same age-category were selected for the study. Both team played in the same local club and were born in 2007 or 2008. Around ten to twelve players were on a team with one goalie. All three games were played and set up in the same sport hall, with the same flooring material and also with the same referee. Game periods lasted 15min which had 30 seconds between. Both teams were recommended to warm-up before. Regarding about the goal-size, this aspect wasn't changed even if the court size was modified. Games were filmed from two different angles with two different cameras. Camera 1 was a GoPro which was positioned higher and covered almost the whole court in every game. Camera 2 was positioned at the floor level, outside one of the corners. Unfortunately the height of the camera tripod was not enough to cover entire court and for this reason it was decided not to use this camera 2 material when analysing.

The whole game time was three times 15minutes which equals 45minutes which will be referred as 100%. However for every small-sided game there was measured "efficient" game time separately in the results section.

7. Results

The significant and interesting results are pointed out in this section. More detailed results of every game are described in their own sections.

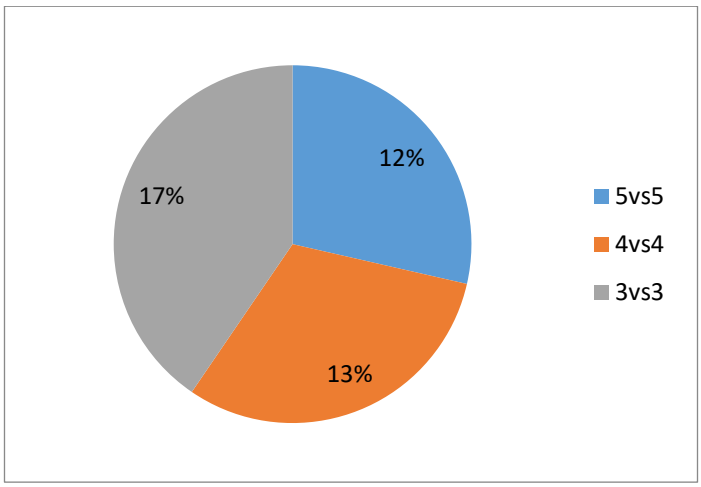

Figure 1. The percentage of the shots when compare to all actions.

This figure presents when the shots are compared to all the actions during the game, the percentage in the 5vs5 was 12%, in the 4vs4 game it was 13% and in the 3vs3 game 17%.

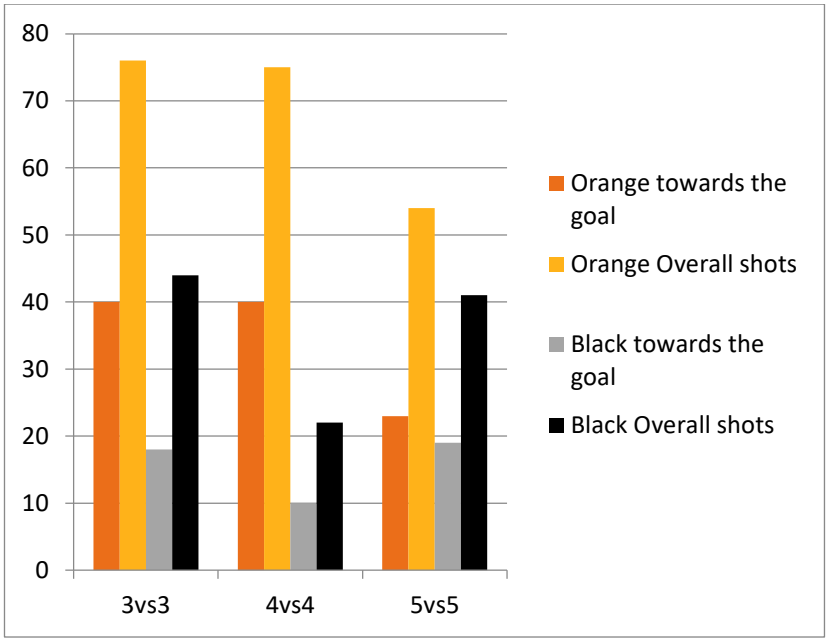

Figure 2. Overall and towards the goal shots for both teams

Second figure shows the difference between shots towards the goal and overall in the game types. There is a major difference between small-sided games compared to 5vs5 game when focused on Orange team. Black team had highest overall shots amount in the 3vs3 however in the 5vs5 they had the most shots towards the goal.

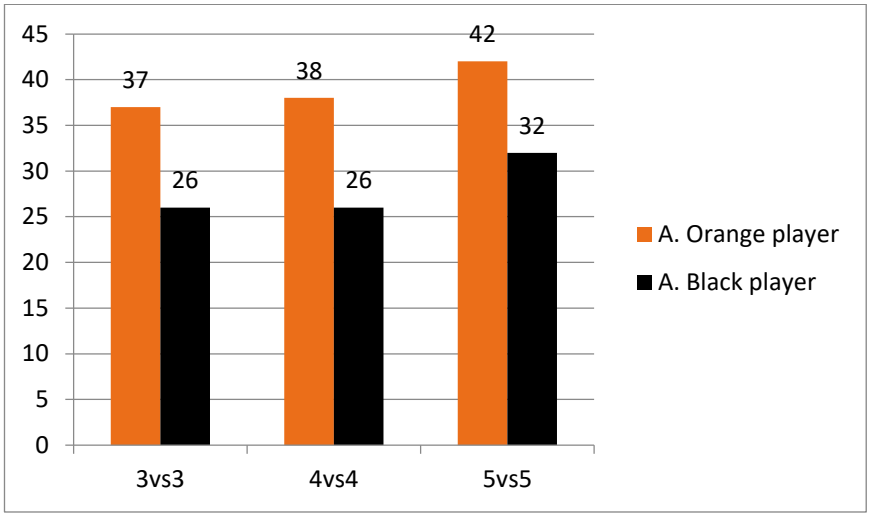

Figure 3. Average ball touches in every game

In the second figure it is examined what is the difference when focused on average ball touches for both teams. The highest results were in the 5vs5 game for both teams. In the small-sided games there was only a small difference.

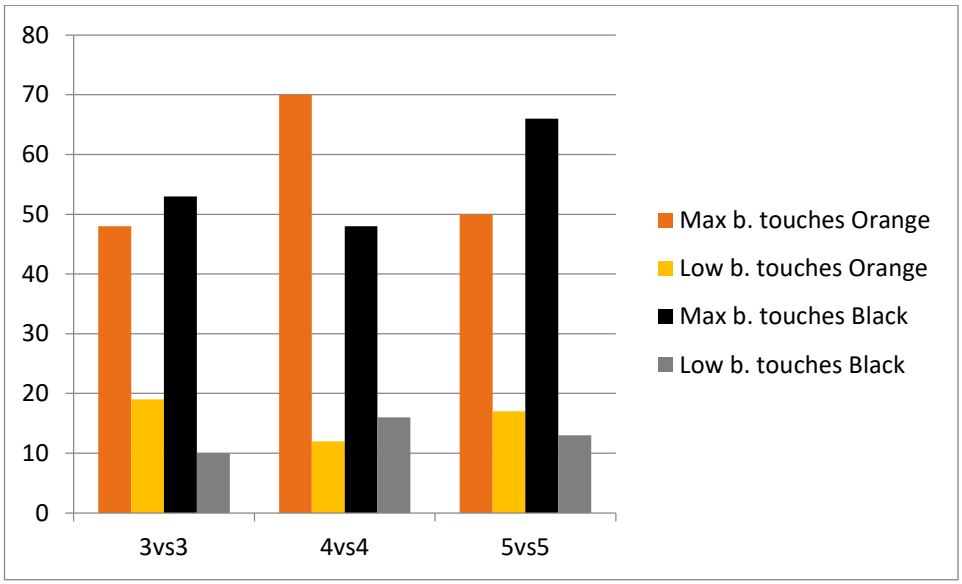

Figure 4. The players max and low ball touches at individual level

This figure shows the max amount and lowest amount of ball touches in the teams when focused on players. The Orange team's results are interesting because of highest ball touch for one player was in 4vs4 game. In the Black team's results the lowest ball touches

had player was the most involved in the 4vs4 game type and similarly the max touches for the ball was the lowest in this game when compared to others.

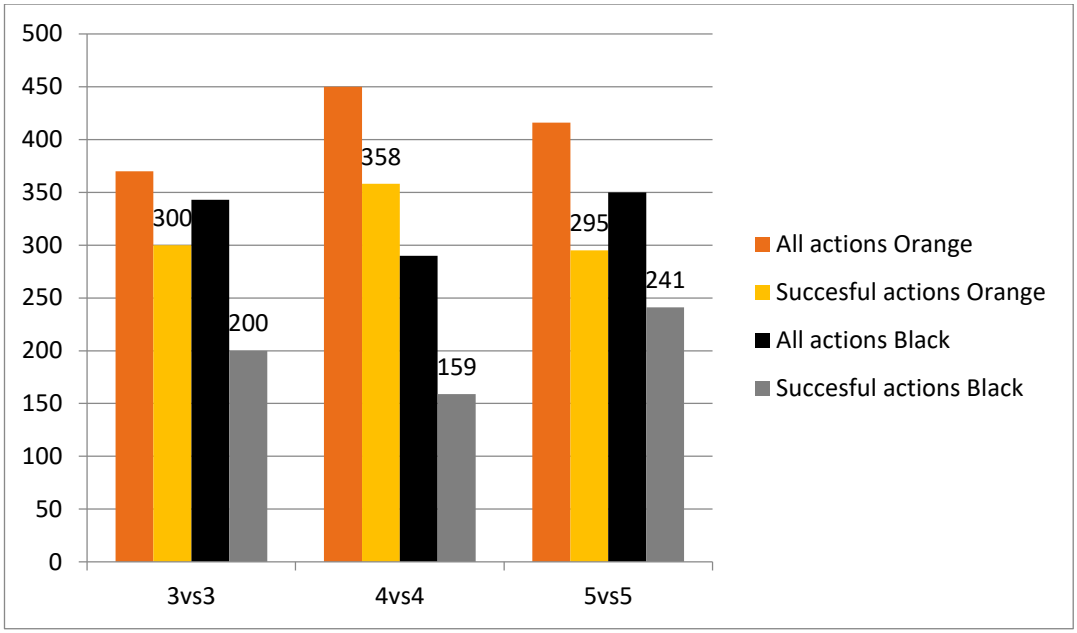

Figure 5. Difference between actions and successful actions in game types

It is important to understand the difference of action and a successful action. An action can be counted even if it was a positive or negative and successful action only as mentioned. There were the most actions for the Orange team in the 4vs3 game and for the Black in the 5vs5. The teams for example have almost the same amount actions in the 3vs3 game however there is a significant difference when focused on the successful actions.

7.1 3vs3 game

Only 74% percent was actual “efficient” game time when game was going. Some of the factors that could explain this would be when players change. Approximately 10-15 seconds is used when changing and during the game there are approximately 30 changes. As follows one goal postpones the game approximately 15 seconds and altogether there were a high amount 30 of goals scored even though the “maalinpienennys elementti” was implemented to this game. Other pauses that happen during the game for example are when the ball goes outside of the court which takes approximately 12% of the whole game time or referee points the right place to continue the game.

The amounts of actions per teams are quite similar. The Orange team had 370 actions and the Black team had 343 however if only focused on the successful actions the differ-

ence is significant. The Orange team had successful actions 300 and the Black team only 200. From all the actions Orange team had 32% of passing and similarly the Black team had 27%. The percentage for running/dribbling and challenges with Orange team was 21% and with the Black team 15%.

The Orange team's successful passing percentage was 72%. The Black team's successful passing percentage was only 57% however running/dribbling and challenges with the ball the successful rate is 85% which is higher. This would indicate that players at this age naturally prefer actions with the ball themselves rather than passing if playing as a team is a not strength. When considering the successful rates, it could be argued that action with the ball is "safer" rather than passing in small-sided games in this age-category.

In addition the successful rate on Black team's passing would explain the poor amount of passing-sequences. A pass sequence is determined when three players are involved and the team possess the ball continuously.

For one player in the Orange team the average ball touch in the game was 37, which 30 were successful. The Black team had average 26, which 16 were successful. In the Black team the most ball touches for a player was 53 and the least was 10. With Orange team the most active player had ball touches 48 times and the non-active had 19.

In the 3vs3 game there was a successful ball event every 4 second. This is an average conducted from the both team's results during the efficient game time. Average ball time for Orange team's player is 136s which equals around 2 minutes and for Black team's player 95seconds which is around 1,5minutes.

7.2 4vs4 game

The "efficient" game time was 77% from 100%. In the game total goals were scored 28, Black team did 5 and Orange team 23. A goal postpones the game approximately 15 seconds and total there were a high amount 28 of goals scored. Likewise this factor causes the "efficient" ball time decrease as described more thoroughly in the 3vs3 results.

There is major difference in teams' events. Orange team had 450 events during the game which successful were 358 and Black team had 290 which successful were 159. Both teams almost had the same pass percentage however when you go more depth and focus only the successful amount there is quite notable difference. The Orange team had 156 passes during the game which successful amount was 80%. On the contrary the Black

team has 92 passes with only with 58% successful rate. The passing-sequence for the Orange team was 27 and for the Black team 6.

Therefore it could be argued that there is a quite skills level difference between the two teams. Other results that strengthen this argument since there were running/challenges events for the Orange team 93 which 90% was successful. Black team had a poor amount, only 36 which 75% was successful. When compared these numbers to the total amount, the Orange team had 20% of running/challenges of the events and the Black team 12%.

The average ball event's for one player in Orange team is 38 which successful ones are 30 and for the Black team the average results 26 which successful is 14. The Orange team had an action happened during the "efficient" game time every 4,6 seconds and Black team only 7,1 seconds. However if only focused on the successful actions during the "efficient" game time, there is an action every 4 seconds.

7.3 5vs5 game

The Orange team changed during the game 22 times and the average duration for one shift was 100 seconds. The Black team's results were 27 changes and average duration for one shift was 80 seconds. Average actions with the ball the Orange team had 42 which 30 were successful. The Black team had 32 actions with the ball which 22 were successful. One of the player's had average ball active game time 128 seconds and the Black team 111 seconds. The Orange team had an action happened during the "efficient" game time every 5,2 seconds and Black team only 6,2 seconds. However if only focused on the successful actions during the "efficient" game time, there is an action every 4,1 seconds.

8. Discussion

When considered the research questions and results it can be said that small-sided games could improve better some sport specific skills which have more repetitions in the small-sided games compared to full size court.

For example in the Figure 1 shooting had the highest repetition percentage in the 3vs3 and it can assume from the successful actions difference that also 1vs1 is naturally comes more often because there is not so much space or time. Next Figure 2 shows clear results that the amount of shots was higher in the small-sided 3vs3 game. However the Black team had most shots towards the goal in the 5vs5 game which could be explained that the team is more used playing with that game type. Considering this the players are more familiar how to positions themselves according the goal and can aim more accurately. The average ball touches results in Figure 3 could be seen as a surprising on the other hand it is understandable why the average is the most highest at 5vs5 game. When thinking about the game environment in 3vs3 game where there is not as much space and time, it is more natural to make decision with the ball itself rather than “risking” it and pass which could be interfered easily. Hence dribbling and 1vs1 skills can improve in this case. Firstly the 5vs5 game environment could be more familiar to the teams also secondly it could be easier to observe where to pass when there is more time and space available which increases the ball result. Lastly, the full size court is usually played as 5vs5 game when team might play more as a team and use the tactics that coach might advised them.

The players max and low ball touches at individual level was illustrated in the Figure 4. The Orange team’s results are interesting because of highest ball touch for one player was in 4vs4 game. It could be assumed that the more familiar game types (5vs5 and 3vs3) were played with more patience and strategy when in the 4vs4 the more confident players took charge and were given the opportunity. In the Black team’s results for the individual lowest ball touches, the player was the most involved in the 4vs4 game type and similarly the max touches for the ball was the lowest in this game when compared to others.

As mentioned before there is a difference between an action and a successful action. An action was counted even if the actions result was not what was hoped for meaning a lost 1vs1, unsuccessful dribbling, a shot that was blocked et cetera. That is one of the reasons why the amounts in all actions are quite similar. For example in the 3vs3 game the teams

have almost the same amount of actions however there is drastic difference between the successful actions. This could be explained that the Black team is not that familiar with the 3vs3 game concept however has almost the same successful rate with the Orange team in the 5vs5 game.

The trustworthiness could be improved in similar study example when choosing the teams. It would be recommended to choose two teams at the same technical and tactical level this could make the games more active and give more data. Also it could be recommended to do a questionnaire for the players and coaches to research how familiar the concept small-sided games are and how many times during a season it is used as an exercise. This particularly would give a sense if the players would be used to small-sided games. Both teams should be familiar or not familiar to even the level between them. If possible it would be wise to keep exact players during every game session to make the data more reliable and decrease the player differences which could influence the data. For example the roster would include 12 players who would play in every game and two spare players if an injury were to occur. Also the lines would be determined and given out to help the tagging and also to try keep the statistics even for every player.

The trustworthiness could be criticized when discussed about the lost time due to the high amount of goals and the ball going outside of the court. For example every time the ball went outside of the court the players got a break which stopped the momentum of the game. Admittedly these games were played in the “proper game setup” yet there could have been balls top of the goals which could have been used in this case to continue the game.

For future suggestions when conducting similar study it would have been wise to consult a professional from the tagging program – in advance- about what factors which are important when working with this tagging program, camera angles and is some pre-information needed about the players and how it should be gathered. With a research based study it is crucial to measure and write every detail down. For example some argument can be discussed in the future and when notes are available it makes it easier and more reliable. Equally important is to make a decision about court sizes with a professional from the Federation or with a sparring partner.

When recording any material with cameras it would be recommended to beforehand to see place and decide the locations for the cameras, especially if one is located at the floor level. When considering the camera angles a roof camera would be the most beneficial if it could cover the whole court. Another possibility would be to have three camera angles.

Two at court level, attached for example to the wall behind the goals and high enough. If the sport hall would have the spectator seats on second floor the third camera could be positioned there.

If the space is large where a study about small-sided games would be conducted in it would be wise to make the hall smaller for example with curtain that can divide the space if possible. This would decrease the time wasted when returning the ball which has bounced outside of the court. When taking into account official game standards, the officiating table would have spare balls that would increase the “efficient time” in the game. Other possibility would be that on top of the goals would be spare balls that goalie could throw into the game when small-sided games would be used as an exercise.

For future research it would be fascinating to conduct similar study with older players and with the recommendations mentioned earlier. Other possibility would be to use the same age-category however the 3vs3 court would be smaller hence it was too big in this study. The reason behind the size was the Finnish Floorball Federation Rulebook for this age category where 10 x 20 m was the smallest court size allowed in a proper game.

To conclude it could be argued that small-sided games improve some sport specific skills better than a full size court. Nonetheless it is important to understand and observe what aspect the coach or athlete want’s to develop and adjust the environment and the task to these needs. Learning a skill is different for every individual however a solid motoric skills helps the learning process and non-linear pedagogy supports physiological well-ness and inner motivation to practise. Instead used only drills where everything is predicted it is more important to teach game sense through observation and quick decision that benefit the game.

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