

Differences between USA hockey and Finnish junior hockey structures and player paths.

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<p>This thesis is about learning the basic principals of USA Hockey ADM (athlete development model) and DMSP (the developmental model of sport participation) that is used in Finnish junior ice hockey. Benefits of both models and how they're used in junior ice hockey programs.</p> <p>Thesis was started at September 2019 when I started my work placement year in Kalamazoo, Michigan. Thesis goal is to find out, what is the optimal development model for ice hockey players to develop. I read articles about ADM and DMSP and I went to USA Hockey lectures and Finnish ice hockey federation lectures to hear more about ADM and DMSP and how their junior hockey player path is built. I interviewed players Daniel DeKeyser from Detroit Red Wings (NHL) and Iivari Räsänen from Quinnipiac University (NCAA) and pro hockey coach Dave Shyjak from West Michigan Broncos (NCAA). I found out that both models have produced pro players.</p> <p>Thesis includes facts from both models and how they work in everyday life, based on my experience as a coach. I used example clubs Kalamazoo Wings, Michigan and Junior Pelicans, Lahti where I have coached and worked for.</p>	
Keywords Ice hockey, junior hockey, ADM, DMSP, player path	

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1 Introduction

Internet and books are full of knowledge about sports and different models that can be used as a coach. American development model (ADM) is not easy to make a research about. Books about ADM are not much created and all the material comes from the USA Hockey administrators. ADM has a lot of common to other common model LATD (long-term development model). ADM is not much challenged or researched in public about strengths, weaknesses, threats or opportunities. All the material I got was from internet. USA Hockey is pretty generous about ADM and so everyone can read and learn about it. Player path instead is not so visible shown anywhere. Some clubs published their junior player path on their own web page, but a guideline from USA Hockey about, how they want their players to be coached in every age group, can be found only if the person is authorised by USA Hockey and those links cannot be opened without an account. When I started to coach in US, I got the account, so I could read about age specific training and goals from every age group from learn to skate to high school.

(<https://www.usahockey.com/agespecificmodules>)

Jean Côté's the developmental model of sport participation (DMSP) is researched over 15 years and there's a lot of books and articles about it. I used a research material from Peter Soberlak and Jean Côté who made a research about the developmental activities of elite ice hockey players. (<http://www.sportni.net/sportni/wp-content/uploads/2014/06/ParticipantDevelopmentinSport.pdf>)

My main reason in this thesis is to find out answers to question, Is the hockey structure better in US than it is in Finland or is Finland, better place to develop junior hockey players and get to play pro hockey? What can we as players, coaches and officials from Finland learn from US ice hockey structure and can the coaches and clubs from US learn something from Finnish ice hockey structure.

I started to think about this question many years ago, before I started coaching myself after my playing career. I got a chance to do my work placement in Kalamazoo, Michigan to find out answers. Is the junior path better in US than it is in Finland? What they have, to offer for players who play junior hockey in US.

In my thesis, I use resources from USA Hockey, Finnish ice hockey federation, Kalamazoo Optimist Hockey Association and Junior Pelicans. I interviewed professional coach Dave Shyiak who coached NCAA team Western Michigan Broncos, Daniel DeKeyser who is US national ice hockey player and former defenseman for Detroit Red Wings and Iivari Räsänen who have played in both US and Finland in his junior years. All of them have

something in common. They think and have showed that playing multiple sport and love of the game of hockey is the number one key for success. They all want to develop themselves and they want to find the way to do it. I will use example organizations as Junior Pelicans from Lahti, Finland. Which is a largest ice hockey club from Finland, where I have coached for 7 years. And KOHA (Kalamazoo Hockey Association) where I did my work placement and the organization is one of the USA hockey's model organizations.

2 USA Hockey junior hockey structure

2.1 ADM explained

In US, ice hockey is the fifth biggest sport. Ice hockey is played in 18 states. USA shares the highest pro league NHL (National hockey league) with Canada. 18 out of 32 teams comes from USA. 2021-2022 there will be a new team called "Seattle Krakens" and that makes the count 19 out of 33.

Junior hockey structure in US is based on ADM (athletic development model). ADM is nationwide model that is used for developing hockey players in USA. It guides clubs and coaches to understand the basics of different age groups and gives tools to develop coaches to understand the principles of hockey. ADM is based on athlete-centred coaching idea, where every player is an individual and needs to be coached individually even in team sport. USA hockey uses ADM also for developing the coaches. Before coach can start to work with the team of any age group, coaches need to read and pass an age specific test. Age specific test is done in internet and it contains these 10 guidance principles and age specific learning goals. Test gives coaches tools and knowledge they need to know about the age group, methods to use and even drills that can be used in practices. To get started coaching ice hockey in USA, coaches needs to register to become a member of USA hockey. They check every coach's background and it's a part of their safe sport theme. After that coaches needs to complete the online age-specific module(s) for the age level of play the coach is coaching. (learn to skate, Peewee, Bantam etc.)

Following ADM from the beginning is planned to help players to achieve their full potential in hockey and utilize sport as a path toward and active and healthy lifestyle. This can be accomplished by following the 10 guidance principles and the age group recommendations, that focus on developing all aspects of ice hockey performance.

2.1.1 Guidance Principles

The 10 Guidance Principles are:

1. Excellence takes time

ADM believes that by following age group recommendations in: tactical, technical, mental

and physical factors are helping player to develop to become a better hockey player. With good coaching and individual love for the game of hockey unlocks players potential.

2. Physical literacy & fundamentals

All athletes should be encouraged to develop their fundamental movement skills, basic sport skills and general athleticism from child throughout the lifespan. Training should be fun, engaging and progressively challenging.

3. Building athleticism

ADM believes that most, if not all, components of fitness are trainable throughout childhood and adolescence.

4. Specialization & Early sampling

Well-rounded, multisport athletes have the highest potential to achieve. Early sampling does not hinder sport performance in ice hockey. Eventually, athletes should have the opportunity to choose their favourite sport and continue to appropriate level. Further highly specialized training in hockey should begin in age of 14-16, given players have desire, motivation and abilities. Early specialization has been associated to negative physical and mental health such as injury and burnout.

5. Growth and individualization

Understanding of normal growth, maturation and development is critical when creating a quality sport program. Long-term athlete development pathways should understand and appreciate for the highly individualized and non-linear nature of the growth and development of youth.

6. Periodization

Athlete development should be guided by general training principles that follows for effective plans of single training session, as well as weekly, season and annual plans. That includes segmenting calendar year in to time intervals for: preparation (pre-season), competition and off-season sports and activities along with appropriate rest and recovery that optimize health and performance.

7. Mental, cognitive and emotional development

Health, wellbeing and positive youth development is the centre of USA hockey ADM. ADM should provide programs that promote both physical fitness and psychosocial wellbeing. Psychosocial development is also a long-term process that programs must consider inclusive of training and competition.

8. Quality coaching

Quality coaching is defined as the consistent application of integrated inter- personal and intrapersonal knowledge to improve athlete competence, confidence, connection and character in specific coaching contexts.

9. System alignment and integration

ADM is a structure not only within and across USA hockey organizations but also across all sporting bodies and physical education that is athlete-centred, coach driven and administrator supported. We have clubs, schools and ice arena facilities all with varying interests. To maximize player's development needs, it's important for those entities to work together and become mutually supportive as each has its part in advancing our game.

10. Continuous improvement

Coaches, administrators and all involved in hockey should seek continuous improvement by implementing new findings, innovations and best practices from sport science, education and coaching. USA hockey is committed to continuous improvement, so that insures that ADM will reflect all evolving aspects of physical activity, sport and the welfare, well-being and performance of our athletes of all ages.

(<https://www.admkids.com/page/show/910488-what-is-the-american-development-model>)

2.1.2 Windows of trainability

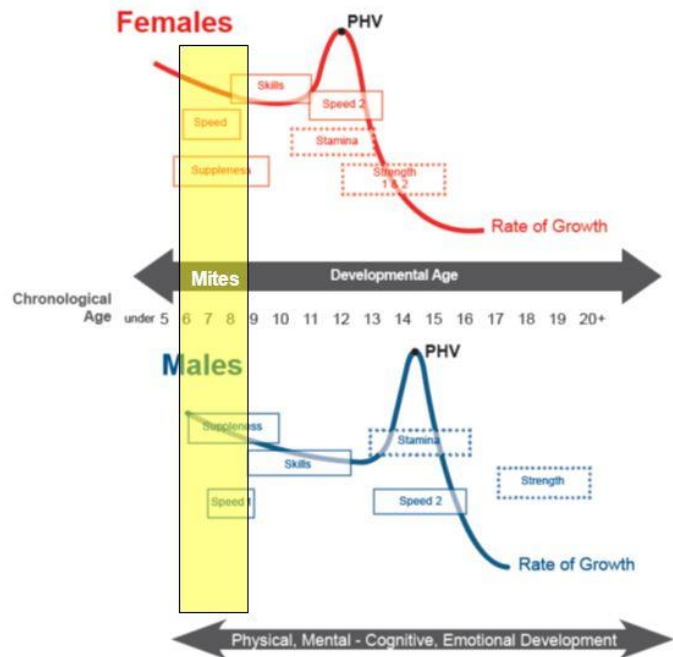
In dryland training, WOT (window of trainability) is a part of ADM. Every child goes through the same growth and development pattern, but as individuals, they move through the process at slightly different rates. As kids grow there are sensitive points in time, based upon chronological and biological maturation, where children are more receptive to developing five major physical capacities: speed, stamina, strength, skill and flexibility. These windows of trainability give athletes the opportunity to develop their athletic packages like no other time in their lives. (these ages are based upon chronological age)

The Optimal Window of Trainability for 8U Mites is for speed and flexibility

On-ice focus for Mites is on Fundamental Movement Skills and ABC's

Off-ice focus is on coordination, balance, flexibility and speed

Speed training can also be included on the ice in the form of races and tagging games



(<https://www.admkids.com/page/show/990393-w-windows-of-trainability>)

Speed window 1: Boys ages 7-9 and girls 6-8

- speed in this stage is defined as agility and quickness in linear, lateral and multi-directional pattern
- the duration of the intervals should be five seconds and under while following young athletes to have fun

Speed window 2: Boys ages 13-16 and girls 11-13

- anaerobic, lactic power and capacity window
- linear, lateral, multi-directional and chaotic speed
- duration of intervals 5-20 seconds

Flexibility window: Boys and girls ages 6-10 and again during high peak velocity (boys 14 and girls 12)

Skill window: boys ages 9-12 and girls 8-11

- "Golden age of skill development". Coaches should focus more on technical skills and individual tactics
- Skills can always be trained at any given age, but not as fast as in this window

Stamina window: Boys ages 13-16 and girls 11-13

- accelerated adaption to aerobic training (endurance)

- always trainable

Strength window: Girls immediately after PHV and boys 12 to 18 months after PHV

- Boys ages 16-20

- Girls 12-16

(http://assets.ngin.com/attachments/document/0042/1584/_Introduction.pdf#_ga=2.22898685.79893743.1602868944-1325615300.1602868944)

2.2 Koha as an example

Koha (Kalamazoo optimist hockey association) established in 1965. It is located in southwest of Michigan. Koha is one of USA hockey's original model associations. Koha is a non-profit organization whose mission is to provide every boy and girl an opportunity to enjoy at excel at the game of hockey. Boys and girls can play hockey from learn to skate through high school.

As I experienced during my work placement year, Koha is a really good club what comes to developing athletes using ADM. Coaches are highly experienced, motivated and they trust in the idea of ADM. From age 8 to 16 players are trained by professional skill coaches, head coaches, goalie coaches and off-ice coaches. Off-ice training is done by Athletic Mentors. Athletic Mentors is a company that provides both individual- and team practices done off-ice. Skill ice that is done weekly for every age group is based on age-specific needs. Progression through the season (annual plan) is planned by multiple skill coaches and USA hockey regional managers to create a coherent plan for players to develop their skills. USA hockey managers monthly visits at the rink to develop coaches and give all new knowledge to use during every day coaching.

Koha has travel teams and house B and house C hockey teams for each level of individual. Travel teams are more advanced teams that have try outs for players to join the team. They play more games and tournaments, train more often and they are more goal-oriented teams. House B is the next level and house C is for boys and girls to have fun at the weekends.

3 Finnish ice hockey junior hockey structure

Ice hockey is the most popular sport in Finland (Helsingin Sanomat 19.3.2019). Finland's highest level Liiga products pro hockey players yearly to NHL. Recent years, players around the world comes in Finland to play in Liiga. Professionals has said that Liiga is the fourth best and competitive pro league in the world after NHL, KHL (Russian) and SHL (Sweden.)

(<https://thehockeywriters.com/top-10-best-ice-hockey-leagues/>)

Finnish junior hockey structure is based strongly on athlete centred coaching and Côté's the developmental model of sport participation (DMSP) coach Erkka Westerlund has said that "Coaching is focused more on person than in technique or playbooks. It's a dialog between a player and a coach, how they can help each other. Everything comes from the players motivation and interests. Coaching just helps with those. That's how we can use all the recourses. Athlete is the active worker, not coaches passive servent." (YLE 30.10.2016)

Finnish junior ice hockey clubs are in the level of excellence. All bigger clubs and organizations have a lot of officials, part-time and full-time employees. Ice hockey sport clubs in Finland have usually a head of coaching, junior head of coaching and skill coach who helps coaches to create the annual plan for athletes to develop. Also, to develop coaches. Finnish ice hockey federation and their local coaches helps employees in organizations to gain more knowledge and helps with the key factors for athletes to train and develop progressively.

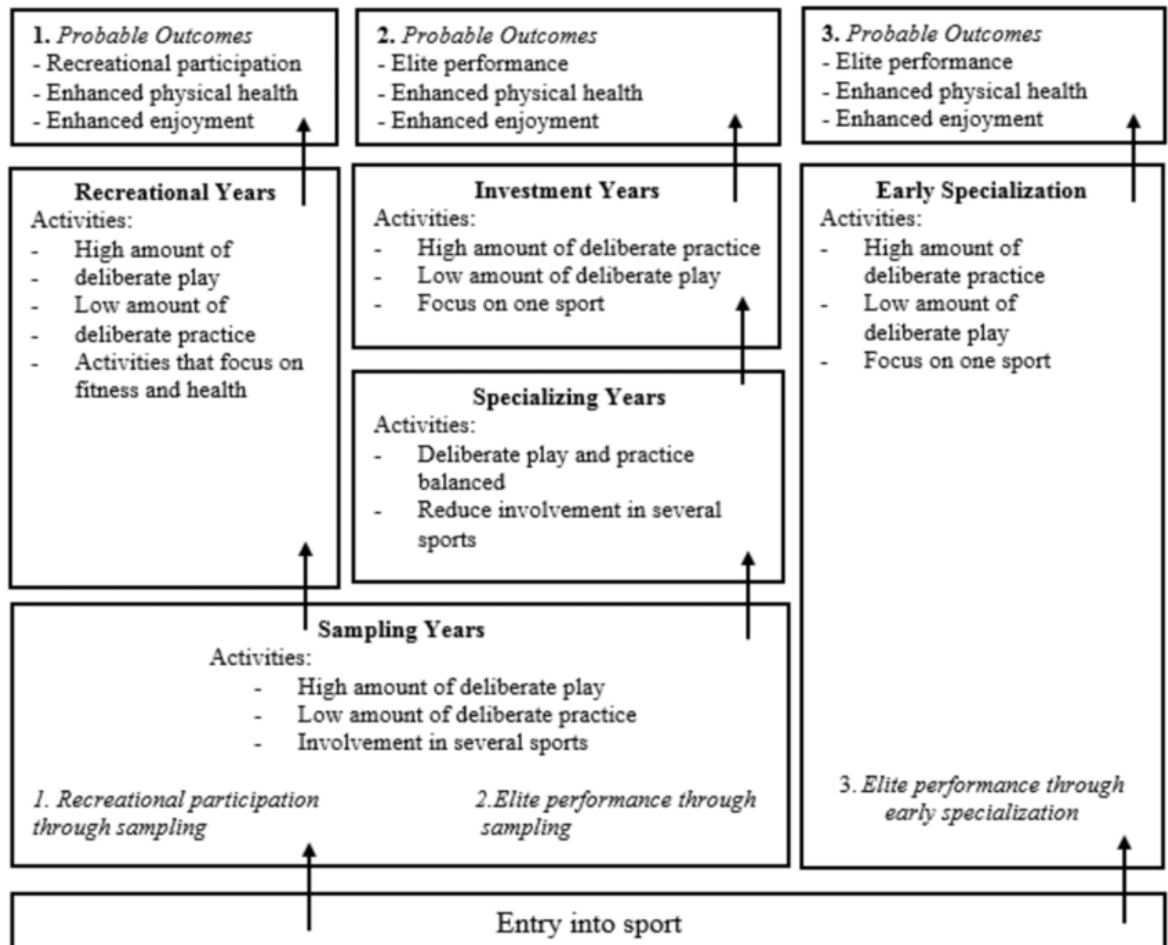
(Juniorpelicans.fi)



(Finhockey.fi)

3.1 DMSP explained

Jean Côté's the developmental model of sport participation model has three stages of development in sport: sampling phase ages 6-12, specializing phase ages 13-15 and an investment phase for age +16 (Soberlak, P. Côté, J. 2013). DMSP is in contrast to the LTAD model (long-term athlete development).



(https://www.researchgate.net/figure/Figures_fig2_281264312)

DMSP believes that the most effective learning occurs through involvement in deliberate practice. (Soberlak, P. Côté, J. 2013.) Deliberate practice is a highly structured training activity, that have a goal to improve performance (Ericsson, K. 1999)

3.1.1 DMSP phases

DMSP model describes three phases of development and they have recommendations in each stage.

Sampling phase (ages 6-12)

- Individual need to have a wide range of activities. Children are given the opportunity to sample different sports.
- Emphasis on fun and excitement. Children need to develop a foundation of basic movement skills.
- Dominated by deliberate play (playing to maximize fun and enjoyment and provide immediate gratification)

(Richard, B. Collins, D. Ford, P. MacNamara, Á. Toms, M. Pearce, G. 2010)

Specializing phase (ages 12-15)

- Focus on one or two sports, while fun and enjoyment is still vital.
- Sport-specific skill development

(Richard, B. Collins, D. Ford, P. MacNamara, Á. Toms, M. Pearce, G. 2010)

Investment phase (ages +16)

- Achieving a high level of performance in a specific sport and the strategic
- Competitive and skill development elements of sport emerges as the important

(Richard, B. Collins, D. Ford, P. MacNamara, Á. Toms, M. Pearce, G. 2010)

3.2 Junior Pelicans as an example

Junior Pelicans is a junior hockey organization in Finland, Lahti. It's the biggest junior hockey organization in Finland. It's established in 2016. It's located in southern part of Finland. There are 80 teams, 1400 players, 200 coaches and 400 officials. Junior Pelicans gives boys and girls an opportunity to play hockey from the age of 5 to 20. Elite players can play hockey at the highest level in Finnish Liiga in Lahti in the team called Pelicans.

Junior Pelicans is a professional ice hockey organization that has professional coaches in every age group. Their plans are to offer joy and experiences in sport of hockey, inspire for excellency and motivate for lifelong physical activity habits. Junior Pelicans has teams in all highest leagues of every age group. Their player path that focus on pro level starts when athlete turns eight years. DMSP system in starting at the age of eight. Focus is to develop players athleticism, individual skills, playing skills, mental toughness and physical attributes. Year by year, training load and specialization to ice hockey takes more part of athlete's life. Junior Pelicans organization have four ice hockey rinks for teams to get ice time.

Junior Pelicans coaches are highly educated and the club gives them game identity and game vision. Tools and facilities to build up the system for athletes to develop are on high level. Coaches co-operates with each other to make sure that players are ready to step up for the next level. Students with interests in ice hockey from Haaga-Helia Vierumäki get a chance of working for Junior Pelicans.

4 Player path step by step

In ice hockey, player path is an age specific guideline for training. Player path starts from skating school and it ends at the highest level in sport. Player path has own routes for players who wants to compete in elite level and for athletes who wants to enjoy playing hockey. Player path helps children to compete at the right stage according to their maturation level, skill level and talent. Main goal in player path is to become an athlete. After having basic movement skills and lifestyle as an athlete, you can become an ice hockey player.

Learning principles in ice hockey that players and coaches needs to be aware of are:

1. Sport Analysis
2. Game identity
3. Player identity

Finnish ice hockey federation explains different stages at player path here:

5-9 years old

- Creating enjoyment in hockey.
- Learning for active lifestyle.
- Healthy self-confidence.

Individual goals:

- Golden rules of playing hockey
- Playing head up
- Small are games with applicable rules
- Games and competitions

Team goals:

- Learning rules of hockey
- Working together
- Playing with friends
- Changing playing positions (forward, defenseman and goalie)

Mental capacity:

- Inspiration for healthy lifestyle
- Developing healthy self-esteem
- Trying your best
- Listening and paying attention

- Self-confidence

Technical skills:

- Basic skills (skating, passing, shooting and handling a puck)

Physical skills:

- Basic movement skills (agility, coordination, balance and speed)
(Finhockey.fi)

10-14 years old

- Learning the game of hockey.
- Becoming an ice hockey player.

Individual goals:

- Diversified development for basic skills and roles of the game (offensive- and defensive playing roles)
- Change of direction (from offense to defense roles)
- Training to co-operate with 2-3 players together to playing with full lines (5 players together)
- Different ball games

Team goals:

- Playing with different roles of the game
- Changing playing positions (forward, defenseman and goalie)

Mental capacity:

- Developing co-operating skills and teamwork
- Directing to exemplary actions
- Tolerance of adversity
- Directing to be more independently
- Thinking own persona
- Self-development capacity

Technical skills:

- Multiple basic skill development (skating, passing and shooting)

Physical skills:

- Refine basic movement skills

- Developing muscle balance and erectness
(Finhockey.fi)

15-19 years old

- Learning for athletic lifestyle.
- Learning to become winning and self-oriented hockey player.

Individual goals:

- Developing playing skills and game speed
- Certainty of game skills
- Identifying different playing roles (5vs5, powerplay and penalty kill)
- Flawless change of direction game (from offense to defense and from defense to offense)

Team skills:

- Game structures and priorities
- Game position changes
- Playing powerplay and penalty kill

Mental capacity:

- Profiling athlete's mental priorities
- Developing psychical skills
- Developing life managing skills
- Training qualities (goal setting)
- Inner motivation for individual training
- Handling pressure under different situations

Physical skills:

- Physical skills development based on game of hockey
- Periodization for off-ice and on-ice training
- Developing recovery skills

(Finhockey.fi)

20 and over

- Learning and guiding for athletic lifestyle.
- Learning to become winning and self-oriented hockey player.

Individual skills:

- Winning different game situations
- Individual recognize different game situations and can perform in standards that team game tactics and priorities permit

Team skills:

- “Winning team”
- 5 players co-operating to win situations in offense- and defense game
- Line-ups winning playing and understanding areas that are important for result of the game (bluelines, in front of the net etc.)

Mental capacity:

- “Best performance under pressure”
- Comprehensiveness in all actions
- Ability for high performance in every game
- Athlete life managing skills – live like an athlete and ice hockey player
- Ability to control all feelings

Technical skills:

- All basic technical skills guarantee winning perform in any game situation (Finhockey.fi)

4.1 In the U.S hockey

In the U.S, player path in hockey is starting from skating school. When children learn how to walk, they can start at the local club who offers skating school. Skating school is for learning fundamental movement with the skates. It’s all about having fun and adapting different movement patterns on the ice. After the children is learned enough of skating, they can join in puck school so they can add stick and puck as they still learn the basics of skating. The stages of player path are:

- At the age of 6 a child can start to play in Midgets. Children at the age of 6 to 9 is now starting to develop sense of the game of hockey. Under 7, under 8 and under 9 leagues gives children to compete against their own maturity- and skill level. They yet don’t play hockey at full size hockey ice, but at cross-ice.
- Ages 9 & 10 (former Squirt) levels are AAA (highest), AA, A, B and C (lowest)
- Ages 11 & 12 (former Peewee) levels are AAA (highest), AA, A, B and C (lowest)
- Ages 13 & 14 (former Bantam) levels are AAA (highest), AA, A, B and C (lowest)

- Age 15 (Midget Minors) level AAA
- Age 16 (Midget Minors) levels AAA (highest), AA and junior varsity high school- A
- Age 15-18 (Midget Major) levels AAA (highest) AA and varsity high school AA & AAA
- Age 16-20 (Junior) age varies depending on the league

Girls league can be played in under 10, under 12, under 16 and under 19 years old.

USA hockey's junior program provides opportunities for players between ages 16-20 to enhance their skills and game sense and is an important part of the organization's overall efforts related to player development.

Currently, USA hockey has four junior leagues, including the United States Hockey League (USHL), North American Hockey League (NAHL), Eastern Hockey League (EHL) and North American 3 Hockey League (NA3HL). The USHL is the only tier 1 league in the U.S, NAHL is tier 2 league and EHL and NA3HL are tier 3 junior ice hockey leagues.

This is basically the junior player path in the U.S. Elite or pro hockey level starts at the age of 17 when athletes have chance to play college hockey. National Collegiate Athletic Association (NCAA) have division 1, 2 and 3, the American Collegiate Hockey Association (ACHA) men's division 1, 2 and 3 and for women division 1 and 2 and National Association of Intercollegiate Athletics (NAIA). Eligibility for playing college hockey depends on athlete's high school academic grades as well as scores on standardized Scholastic Assessment Test (SAT) or American College Test (ACT). Also, athlete needs to be amateur hockey player, which means, they cannot have games in any kind of pro hockey leagues anywhere in the World.

At the age of 18, athletes can start to play hockey in men's leagues. In the U.S, there is three major men's leagues. East Coast Hockey League (ECHL), American Hockey League (AHL) and National Hockey League (NHL).

4.2 In Finnish hockey

Finnish player path is pretty much same as it is in the U.S. Children can be registered to the skating school at the age of three. Grassroot hockey is for children who can skate a little bit and they are old enough to start trying ice hockey with stick and puck.

Finnish ice hockey federation starts their official leagues at the age of eight. Finnish league starts and children starts to attempt in local tournaments and games, which are played at the cross-ice. The stages of player path are:

- Ages 9 to 11 children have hockey games locally and they have blocks where is a different amount of teams depending on a location of the block.
- Ages 12 to 14 levels are AAA (highest), AA and A (lowest)
- Under 16 (former C1 juniors) levels are SM league (highest) and Mestis
- Under 17 (former B2 juniors) levels are higher division and lower division
- Under 18 (former B1 juniors) levels are SM league (highest) and Mestis
- Under 20 (former A juniors) levels are SM league (highest) and Mestis
- Under 22 levels are higher division and lower division



(Junirpelicans.fi)

Junior Pelicans, Lahti has two different player paths: for players who have motivation and skill to become an elite player and for players who wants to enjoy the game of hockey. Players can move between these two player paths during their development. For example, player who enjoys playing hockey at the age of 10, develops and have the motivation to focus more on hockey can have a chance to step up to pro team and opposite.

Morning ices start when player starts upper comprehensive school. Moring ices are extra practices for players who is playing at the highest team for that certain age group and school grades are good enough to participate on the ice. Moring skates focus on players individual skills.

Easy hockey is for players who wants to enjoy the game of hockey and they don't get any stress for playing it and they are having fun while learning the basics of ice hockey. Players of any age between 9-20 can start playing hockey.

5 Coaching junior hockey

Coaches need to understand that quality coaching is not only to teach the game of hockey. Coaches need to understand the importance of periodization. Physical, mental, technical and tactical plans have to be taken care of when planning annual plan. Physical training in junior hockey depends on athlete chronological-, relative-, developmental-, skeletal-, general training age and sport-specific training age.

Mental coaching in junior hockey is to make player to understand their self-image. Player identity is an important part of development of the player. What are their strengths and weaknesses? What's the role of the player in the team? How they learn? How handle winning and losing? All players in the team are different and they have different backgrounds.

Coaching technical and tactical skills in junior hockey is based on their general training age, sport-specific training age and skill set of players. What they can do and what they can't do yet. When coach is planning the practice plans, they need to think what are we practicing, when are we practicing, why are we practicing this, where are we practicing and is this plan relevant and moving us towards the goals. What is the percentage of individual skill, game skills and game sense.

There's no one right way of coaching, but to prevent injuries and overtraining, coaches need to have the knowledge of who they are coaching. Using right methods and tools at the right age and understanding the balance of training and resting builds a healthy environment for athletes to grow.

5.1 Physical

The window of trainability is a critical period of development where training has an optimal effect on athlete. Five Ss: Stamina (endurance), strength, skill, speed and suppleness (flexibility) are the best way to describe the windows on optimal trainability.

(Picture at page 6)

Before growth spurt, child needs to learn the fundamental movement skills, so they understand how their body can move. During growth spurt first thing that grows is children foot. After that shinbone starts to grow, thighbone and spine at last. In ice hockey, skating is the most important skill to learn. Peak high velocity (PHV) is the fastest rate of growth spurt. Even good skater can become a bad skater if their coordination skills, muscle

strength and balance skills aren't trained enough before the start of growth spurt. At the start child might have short limbs and big torso, and during PHV it might change that the child has long limbs and small torso in relation to the rest of the body. It might look like the child can't skate at all, because of the growth of limbs.

Kalamazoo Wings, where I worked for eight months in season 2019-2020, their off-ice training was way different than what we are used to do in Junior Pelicans. Players under 18 years old trains individually during summer. Many players have their own summer hobby that they are playing during off-season. Off-season is the period of time at the start of the season where players focus on developing individual skills as strength, speed, balance, stamina etc. In Kalamazoo, players sign up for open gyms, where they can train at the gym with strength and conditioning coaches. Athletic Mentors is the name of the company who runs off-ice training during the season and off-season. Athletic Mentors have their own gym at the ice hockey rink where Kalamazoo players are practicing. Off-ice practices are once a week after the ice practices. Physical development is happening on the ice. Many players have one or two other sports other than ice hockey, so some players are first at the other practices and then they come on the ice without any warmups or other off-ice training. On-ice training is high intense training that develop all the abilities that ice hockey players needs, that's how coaches think in Kalamazoo. For example, under 15 team has three on-ice practices at highest level and one off-ice practice after ice practice. Physical testing happens twice in season both off- and on-ice. Skill coaches does the on-ice training at the start of the season and at the end of the season. Strength coaches does the same. Same coaches are measuring same spots every time.

Junior Pelicans teams, that I have coached for seven years from 12 to 17 years old, does off-ice season with the team for eight weeks approximately and after eight weeks starts three weeks individual practice period before competition season. Main goal is to build up individual physical skills that players needs during season. Strength to develop speed and balance, aerobic condition to play more minutes and anaerobic condition to recover faster during the game or practice. Main idea in Junior Pelicans is to develop those attributes that is harder to train on-ice. Off-season practices are done on dryland. Pro teams have practice hours off-ice as many hours as they have years age. For example, under 16 pro team has 15 hours of dryland practicing during one week. Six days and six practices with the team and two individually. Teams have different plans for testing, but usually the first testing is done before off-season and second after individual training period to see the results and development during off-season.

5.2 Mental

Mental development in junior hockey is to get players to trust each other and themselves. Other skills are: positive self-image, goal setting, enhancing confidence and achieving the most productive mindset. Coaches and players have the biggest part of creating a positive training environment, where players can develop themselves to become the best version of themselves.

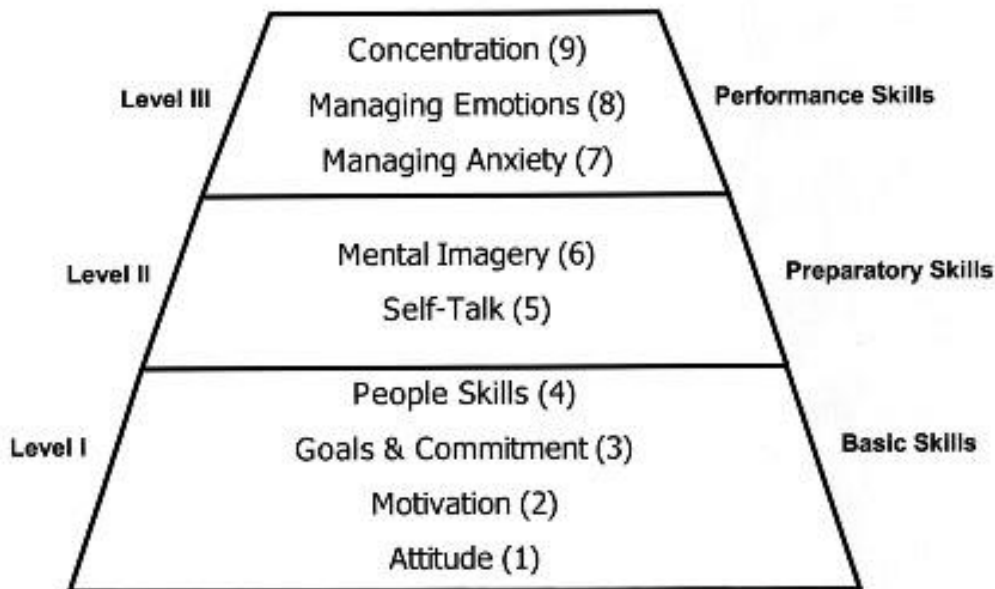
Mental coaching is often understood that it's between sport psychologist and a player. Also, parents and adults are in big role in children mental capability. When child born, parents and doctors are first people they see. Whom they trust and whom they copy. Childhood is an important time of children life, where they built the trust between child and adults. Trust and respect for coach and other players is an important key to build up this positive training environment. Coaches and players should be taught, how to give feedback and what kind of feedback should be given at certain situations. Players shouldn't fear of making mistakes. How coaches behave when player does a mistake, is an important thing in further in players career.

Positive goal setting, imagery, self-efficacy, visualization and positive self-talk are also mental skills. Goals in junior hockey are split in two categories: individual goals and team goals. Individual goals should be set by player itself. Coach can challenge player when they set their goals, but it should still come from player itself. Individual goals can be for example, how many goals they score or how much they improve their skating test results. For coaches, the main thing is to give tools for players so they can reach their goals. Team goals comes from all the players and coaches. It's the big picture. How the team wants to play their own game and where they want to go during the season. Examples for team goals can be to keep goals against under two goals per game or to win state championship. Neither of the goals should come only from coaching group.

Kalamazoo Wings under 15 team had three different coaches with different coaching methods. All of us had the reason for coaching to develop players and help them to achieve goals. Second reason for us was to keep players love for the game. Winning was the third important thing. Winning was the result of doing first two things well. Players had one on one meetings twice during the season. Players made their individual goals themselves and we as coaches red them and we gathered enough knowledge to help players to achieve their goals. We as coaches focused on giving only positive or constructive feedback. Open environment permits constructive discussions between players and

coaches. Players learn to handle constructive feedback and they understand the difference between bad feedback and constructive feedback. Also, players give feedback for coaches and other players as well, so the training environment becomes open and fair for everyone.

Mental coaching in Junior Pelicans is pretty much same as it is in Kalamazoo Wings. Cultural differences are visible between Finnish and American players. Finnish players are more silent than Americans. It's easier to ask players to make self-evaluation right after practice or games with their phones, than ask one by one where they did good and what should they improve for next game or practice. The environment in Kalamazoo ice hockey rink is more positive when other coaches wave for players and they ask comments about games and practices. We cannot change cultural differences, but we can create an environment where all the players can be themselves. Laugh or cry it should be allowed at the team.



(<https://www.sportpsych.org/nine-mental-skills-overview>)

5.3 Technique / Tactical

Fundamental movement skills and sport skills are most trainable between the ages of 5 and 12. Coordination skills, motor skills and nervous system develop very well in physically active children during childhood. Coordinative maturity occurs before sexual maturation and is the main reason early specialization sports begin sport-specific training at the age of 5 or 6. Children at these sports need to acquire the necessary sport-specific and general skills before the onset of the growth spurt. However, in late specialization sports,

intense training of specialized skills at an early age can provide detrimental to development. Early sport-specific training contributes to unbalanced fitness, which, together with early training of technical-tactical and sport-specific skills results in young athletes not developing the broader skill base necessary at later stages.

The accelerated adaption to motor skills and coordination development, from 8 to 11 years of age for females and 9 to 11 years of age for males, is called peak motor coordination velocity (PMCV). Most experts confirm this sensitive period. Both coaches and parents need to understand that fundamental movement and basic sport-specific skills need to be acquired before age 11 and 12, for girls and boys respectively. Specializing early in late specialization sport tends to have negative consequences. A considerable body of evidence shows that early specialization in late specialization sports contributes to burnout and early retirement. Coaches should realize that, although skills are always trainable, skills trainability gradually declines after 11 to 12 years of age, or, more precisely, after the onset of growth spurt. That is not to say that improving skills after 12 years of age is impossible; rather, the point is that the foundation for skills learning are laid before age 12. When these foundations are not properly developed, people have more difficulty improving skills later in life. As a result, development may be hindered.

(Balyi, I. Way, R. Higgs, C. 2013)



(<https://fundamentalmovementskills.weebly.com/purpose-and-importance.html>)

Kalamazoo Wings organization is one the USA Hockey Mode Club. USA Hockey members visit the club skill ices monthly and they give tools for coaches at the club to create

plan to develop skills on-ice. Coaching clinics are also done by USA Hockey. Members of USA Hockey visits Kalamazoo and they lecture coaches about newest researches and methods to coach. After the lecture, there's demo ice with one of the teams on-ice where coaches participate to use these new methods. Kalamazoo Wings as a club, is an ideal club to try new ideas and actually try them on the ice.

Kalamazoo Wings have two goalie coaches and eight skill coaches. Skill ices are planned, so every team gets an hour per week on-ice training with skill coaches. Annual plan is made by the club with the help of USA Hockey. Skill ices are done stationary that there's 4 to 5 stations and one coach per station. Individual feedback is given at every station. Small groups give a perfect chance to develop skills by getting a lot of repetitions per station. Every ice practice has a certain skill to focus on.

Junior Pelicans teams don't have similar skill ices that Kalamazoo Wings does. Morning ice practices are focusing more on skills. Morning ice starts with the players who starts up-per comprehensive school. Coaches who works for Junior Pelicans are planning practice plans. Coaches co-operate together and players know their individual development points to focus on.

6 Research work

On this thesis, I wanted to compare the structures of US and Finnish junior hockey. I wanted to find out, is ADM or DMSP better model and what kind of players are these two model examples producing. I made a small inquiry for coach Dave Shyiak (Kalamazoo Wings skill coach, NCAA Michigan Broncos assistant coach) who has seen a lot of Finnish hockey players. His coaching season 2020-2021 in Minnesota Cloud university where's two Finnish players Jami Krannila and Veeti Miettinen. Daniel DeKeyser (former Detroit Redwings defenseman and USA national player) who played for West Michigan Broncos and played his whole career in Michigan junior hockey team Compuware and livari Räsänen (Finnish junior national team player and former NCAA player in Quinnipiac university) who played season 2019-2020 in Muskeagon Lumberjacks, Michigan and was planning to play his 2020-2021 season in West Michigan Broncos.

I used small query as a method to find out other players and coach opinions of both ADM and DMSP. Questions were decided by the need I had.

Question for Dave Shyiak was to get his ideas of developing players in Kalamazoo Wings and how he thinks about ADM model.

Daniel DeKeyser's questions are about playing pro hockey in Michigan. For players who have interests of playing hockey in NCAA to reach their goals of playing at the highest level they are a capable of.

livari's questions were more about the differences about training hockey in Finland versus US. How coach's coach and how he thinks that is ice hockey, as a sport, more early specialization sport or late specialization sport.

6.1 Research questions and answers

Questions for Dave Shyiak and his answers:

1. Physical training is basically done by Athletic mentors, right? How you see, is players physical level high enough to play hockey in high level or would you add more off-ice training?

"I would add some more off ice training at the age of 14. Especially for the kids that are playing travel hockey. Proper training and technique will enhance the body mechanics for on ice movements."

2. I didn't see a lot of mental coaching when I was there? How do you see that? Are players getting enough mental training?

"At the youth stage it is vitally important to have mental awareness for these kids. It starts with the parents, teachers and coaches. It should be talked about in an open forum but also kids need to be aware of who they can go talk to if they feel they may be experiencing some type of mental health issues."

3. How do you see the ADM? Is it a good model to make players better and as a player path from learn to skate to pro?

"The ADM is an excellent model for development and growth in the sport of hockey. It is about having fun through reps and stations while incorporating the foundations of the game. It has been a model of success for years and it continues to bring growth and diversity to the sport."

(Shyiak 16.9.2020)

Dave Shyiak agreed that ADM doesn't lead players to have all the necessary skills itself to develop individuals to pro level of hockey. ADM has a lack of sport specific training as physical skills and mental skills.

Questions for Daniel DeKeyser and his answers:

1. Tell me on your own words, what are the physical/mental requirements to be a good NCAA player?

"The NCAA is a very good development league for the pros, or for players whose career might not go beyond college but gives them a chance to earn a degree and still do what they love to do. You have to be in great physical shape in order to be successful. This means workouts all year round, yes even in the summer, and a rigorous training schedule during the hockey season as well. Sometimes it means working out as early as 6am on some days. For myself, I thought Tim Hermann did an awesome job of getting us through workouts while not conflicting with our class schedule during the day. He would get everyone in and out in about an hour and it was a great uptempo workout. These are important to continue to gain strength and muscle during the hockey season, not to mention all the hours skating during the week in order to be in great cardio shape as well. It takes all this as well as trying to eat properly on campus if you want to put yourself in the best situation for success."

2. What kind of hockey is played at NCAA (compared to USHL).

"NCAA hockey is a higher level than the USHL. The USHL is a big feeder league for college hockey. The game is similar but it is definitely a step higher. Everyone in college is

bigger, stronger, faster, and have matured into their body more. Players in the USHL are often still trying to grow into their body and get strong enough to play in the NCAA. Sometimes NCAA arenas have a bigger ice surface and so the game is played on a different size of ice. This can change the game a bit as there is much more room on an "Olympic" size sheet of ice as compared to "NHL" sized ice. The USHL is a great development league and many players are drafted into the NHL when they are the ages of USHL players."

3. How the school supports playing hockey in Michigan?

"Michigan is a big hockey state and there are many fans of all ages that get involved in the game. Many cheer for their favourite NHL team, but college hockey is great because you get to play for your school. The students at the school can really get behind their team and make the home arena a very hostile environment to play in. If you have ever been to a hockey game at WMU then you know that is one of the loudest arenas in all of college hockey and can make it extremely difficult for an opposing team to win in. The students are very loud and always get all over the opponent during games with different chants from the stands. When an opposing player gets a penalty, the student section is surrounding the penalty box, making for a very unpleasant place to be for an opponent. Very few NCAA arenas can replicate the type of atmosphere at WMU.

3. Season 2012-2013 you started with Broncos and then moved to Detroit, what were the key reasons that happened?

"In 2012-13 I started my college season as usual, but towards the end of the season I had to decide if I wanted to turn pro, or play out my final year of eligibility in college. I decided that I was ready to turn pro. I had 3 good seasons of college hockey and felt that I was ready for the pro game. Once I decided to leave, I had several different offers, but ultimately decided to play in my home city for the Detroit Red Wings. I thought it was a good opportunity for me since players such as Nick Lindstrom, Brian Rafalski, and Brad Stuart, all well-known defenseman in the NHL had left the team due to trade or retirement. The Red Wings were in a bit of a re-building phase with their defensemen and I thought this offered me the best chance of securing a spot and finding a role in the NHL. I'm glad I made the decision I did and I feel like that decision helped give me the career I have today. "

4. Can you give any tips for Finnish hockey players who would like to come in Michigan to play college hockey?

"Any tips I could give Finnish players looking to come to Michigan to play would be, definitely do it. It is a great hockey state with tons of history of the game whether it is from the NHL level, to minor league pro, to college or USHL. This state offers some of the best

ways to play the game and gives a chance to take it as far as someone would like to. I've played with a few Finnish players one the course of my career, Teemu Pulkkinen, and most currently with my teammate Valteri Filppula who, as of last week, just played in his 1000th NHL game which is a huge accomplishment for any player. Both were great teammates. I think Michigan is a great place to play hockey and advance your career if that is what a player is trying to do. The wealth of hockey knowledge around the state is well known and many excellent coaches either are still currently here coaching, or are in other places spreading their hockey knowledge that they garnered here as well."

(DeKeyser 4.2.2020)

Daniel DeKeyser believes that ADM provides players to have a degree along with playing career. Teachers and administrators helps players to deal with school and ice hockey career. Specializing to ice hockey in physical, technical and mental point of view starts when players join high school through college. Sport-specific training in college is at high level and moving from high school to college is a big step for players. Lack of any of the skills (physical, technical or tactical) might lead to drop out from college hockey.

Questions for Iivari Räsänen and answers:

1. How did you feel ice hockey training in Finland as junior hockey player? Were there too many practices (training load) did you get to chance for playing multiple sports or just ice hockey. Were your coach's athlete centred or was their focus on winning games?

"Training is really good quality in Finland. I wouldn't say that there's too many practices, but I think that players should have a chance of playing multiple sports at the same time. For example, soccer at Monday to Wednesday and ice hockey from Thursday to Saturday. I felt as a junior hockey player, that coaches were more athlete centred, but of course, all of them wanted to win."

2. How training in Michigan USHL Muskegon team was different that you had used in Finland under 18 and under 20 years of age teams?

"Training in USHL was different than training in Finland under 18 and under 20 years of age teams in many ways. Instead of having morning and afternoon practices separate, in Muskegon player came at the rink 10am. From 10am to 12pm players had time to go and have "skills session" it's optional skill ice with the coach and physical training had to be done in this time frame. Physical development has more focus in Finland than in USHL. Muskegon one-ice practice started, if I remember correctly, between 1pm and 2pm. On-ice practice was about 90minutes. There's more money and free ice time to offer for players in USHL compare to Finland. It made it possible to train skills on-ice individually."

3. What do you think should children focus on hockey as young as possible or should they play multiple sports at the same time as old as possible?

“My opinion is that, diverse training definitely has good benefits for any “number one sport” you choose. I can’t say only one right option, but I think that system should make it possible to train multiple sports at the same time. For example, many US players have two main sports with individual development goals until high school, when many professionals have started to play ice hockey at the age of three.”

(Räsänen 3.11.2020)

Ilkka Räsänen thinks that DMSP has benefits to not drop out during any DMSP phase. Multiple sports along childhood and junior age keeps motivation high all the to investment phase. Specializing in sport starts earlier in US than in Finland. Directing to individual training in US starts at high school age. Players have a lot of individual training time in US than they have in Finland. That’s why deliberate training have more focus in Finland.

6.2 Perception

We had many conversations with Dave Shyjak when I was coaching in Kalamazoo. He was interested of our ice hockey structure in Finland. We both agree that in Kalamazoo, players under 14 years of age don’t have enough physical training. Dave talked about travel hockey, which means players don’t play games locally but they travel all across the Michigan. It’s similar with Finnish Liiga, but in bigger scale. In Michigan, even 16 years of age players might play two full games in one day during season and without good physical skills and athlete individual fitness level, there’s high risk for injuries. Dave said that Finnish players that comes on try outs are in very good shape. Their fitness level is at high level. Also, players in Finland has more injuries than in Michigan. Overtraining and bad techniques are often the causes.

Dave said that “it is vitally important to have mental awareness”, for what I experienced there’s not much mental coaching in both Michigan and Finland. It’s more about making and following the rules that the ice hockey federation, club and team has. One on one meetings are both done in Michigan and Finland.

Dave believes in ADM model. “Puck touches” was the word that he mentioned many times when we talked during my stay in Michigan. The skill level of young players is at high level in Michigan. Small area games and consistent skill training develop players individual skills in small area of ice.

Daniel DeKeyser played under Dave Shyiak's team West Michigan Broncos in Kalamazoo. He started playing hockey in Michigan and played his whole non-pro career in there and he's playing still in Detroit Red Wings, Michigan. Daniel is certain that if player want to develop to play in elite and get a degree of playing ice hockey, they should go and try out playing in NCAA. Physical development is a full year challenge. It's not how much you train but how much high-quality training players have. Cardio is done mostly on ice. Finnish players still do a lot of running and jogging before starting up the actual off-ice training. Overall athleticism is the key to succeed in college hockey. For high school players, USHL is Daniel's option to go and play. USHL games are played at the small "NHL size" rink, that helps player to adapt the game style faster than European players. Many USHL players get drafted to NHL. School community is also helping players at the school and during the game. In Finland, school mates don't have choir at home games to celebrate the home team.

Teachers have positive income for players to play hockey. They can skip some lessons as long as grades don't drop too low. Getting degree from college is an important goal for player who play in NCAA. When Daniel decided to play college hockey his goal was to play someday in NHL. He played three good seasons and he was undrafted player. NHL coaches and managers saw his late potential and development and offered NHL contract. Season 2018-2019 he was fourth highest scoring defenseman in the team and led the time in plus minus statistic. Daniel is a perfect model of player who don't get drafted to NHL, but can still play in high level because of his constant development. Coaches in Michigan have a lot of knowledge of succeeding and development of the players. Playing in Michigan provides tools of reaching pro hockey career and coaches are willing to help players to achieve their goals.

livari is a talented Finnish hockey player who have played in all Finnish junior national teams. He played his junior years in Tappara, Tampere and decided to go and play in Michigan to reach his goals to play pro hockey. At the age of 18 he decided to go and play in Muskegon, Michigan. He saw the potential in ADM model and USHL league. His junior memories from Finland were positive. He said that "training is really good quality in Finland." He played only ice hockey and we both agreed that playing multiple sports help out players game sense. He was happy, when he went to Michigan, that how much individual ice time there is and it improved his skills a lot. He didn't say that ice hockey is late specialization sport. There are many roads for players to play pro hockey.

7 Results

7.1 SWOT analysis

I made SWOT (strengths, weaknesses, opportunities, threats) analysis from both Kalamazoo Wings and Junior Pelicans and their player paths below. SWOT 1.0 is about Junior Pelicans and Kalamazoo Wings as a club. SWOT 2.0 is about ADM and DMSP.

SWOT 1.0

NAME	Strengths	Weaknesses	Opportunities	Threats
Junior Pelicans	<ul style="list-style-type: none"> - More ice time for juniors. (morning and afternoon ices) - Club supports players individual goals. - Physical development is well planned. - Club gives tools for coaches to create an annual plan for players. - Knowledge of coaches. - Coaches are mostly athlete centred coaches. 	<ul style="list-style-type: none"> - Training load before on-ice practice might get strength away from on-ice practice - All the skaters and goalies can't participate morning skates and goalie ices. - Players don't have much free ice time or gym to train individually. 	<ul style="list-style-type: none"> - Club provides a player path to grow from skating school to adult leagues. - Club has competitive teams in every age group in highest league. - Lahti has pro team in Liiga. 	<ul style="list-style-type: none"> - Too many hours practicing in young age might have outcome for burnout or bad grades in school.
Kalamazoo Wings	<ul style="list-style-type: none"> - Skill ices are for all the players in the club. - Playing multiple sports is possible and coaches encourage to have couple sports. - Coaches demands good grades even in young age. - Knowledge in the club is at high level. - USA Hockey members give tools for coaches and club to develop their practice plans. 	<ul style="list-style-type: none"> - Club don't have to offer teams at highest leagues. - More off-ice training should be done. 	<ul style="list-style-type: none"> - Players have free individual ice team. - Players have free open gym hours to train individually with strength and condition coaches. - Kalamazoo Wings has coaches from both ECHL team and NCAA team that see players and coaches on ice. 	<ul style="list-style-type: none"> - Players leave the club for hoping to get on highest league teams. - Injury risks of not having physical level at the required level, especially on travel team players.

Junior Pelicans have a player path from learn to skate to Mens Liiga. Players based on their motivation and their physical and technical skills can change between player paths, if they focus more on ice hockey rather than playing ice hockey as a hobby. Also, change for drop out raises when players start to have more deliberate practice at young age.

Kalamazoo Wings have a unique skill development system because the help they got from USA Hockey. Player path in Kalamazoo leads players from learn to skate to ECHL team or NCAA team West Michigan Broncos. But club can't provide highest junior team to train and play, so the threat for players to move to another team raises when player can't have as much competitive training as they are a capable of. Also, ADM in Kalamazoo don't have enough physical training to keep players in good shape and it might have a risk for injuries.

SWOT 2.0

NAME	Strengths	Weaknesses	Opportunities	Threats
ADM	<ul style="list-style-type: none"> - Guidance principles are easy to follow and they provide healthy environment. - ADM is clear and easy to follow. Windows of trainability is simple and help coaches to periodize their training plans in each age group. - Coaches have knowledge to coach different age group when they finish age specific modules before start of the season. 	<ul style="list-style-type: none"> - Deliberate play don't have much room in ADM. - Children have more deliberate practice and coaches needs to have knowledge and skills to teach correct techniques. 	<ul style="list-style-type: none"> - Coaches who starts their coaching career have low threshold to start. They get all knowledge they need from age specific modules. - Players should have very good basic physical, technical skills and self-esteem skills if they have been coached correctly. - ADM co-operate with high school and college to provide players to have their degree. 	<ul style="list-style-type: none"> - Early specializing in one sport might lead drop outs. - Risk for coaches to be less athlete centred and more winning oriented to make themselves look good.
DMSP	<ul style="list-style-type: none"> - Small chance of drop out during each phase. - Chance of playing multiple 	<ul style="list-style-type: none"> - Balance between deliberate play and deliberate sport has not been told exactly. 	<ul style="list-style-type: none"> - Optimal training load for children to develop. - Players at specializing 	<ul style="list-style-type: none"> - Deliberate practicing at early age without good motivation might

	sports and have more deliberate playing. - Children learns basic movement skill in fun way.		phase can have still two sports. - Vision and imagination from other sports can develop game sense and playing skills for other sports.	lead to drop out. - Individual skill development individually might lead players muscle memory to adapt wrong techniques.
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ADM is very challenging model to follow. Players who want to play pro, needs to have enough motivation to train. Players need to learn how to train and how to enjoy training. If coaches have patience to follow WOT and give players enough feedback and courage them to play more without pressure, they should have many options to follow in their own player path. ADM gives coaches a motivation to develop and with wrong mindset, they might coach more winning oriented and they become more dictature coach than athlete centred.

DMSP gives players chance to play multiple sport. Playing multiple sport decrease change to burn out and drop out from their sports. Deliberate playing like street hockey and street basketball raises players inner motivation and they learn more by playing different sports. Players can change from each phase (sampling, specializing or investment) to recreational phase if they want to focus on other sport than ice hockey or they want to jump and enjoy the game of hockey in older age. Players have more self-knowledge about their motivation. Starting specializing phase too early might lead to drop outs.

8 Conclusion

The biggest perception that I discovered while gathering the info about structures, player paths, cultures and models was that on the paper they are very different, but on the field or on the ice hockey rink it's pretty much same. The fact is that NHL (where most of the motivated junior hockey players are heading at) is played at the smaller rink than the "Olympic size" rink we're having here in Finland. The number of the NHL players produced both from Finland and US is not too big according to facts and I hoped to find answers about why. Is it rough to say that Finnish junior ice hockey players are in better physical shape than players in Michigan? That kind of statement needs a lot of physical testing between top tier players from both Finland and US. But, if players in Finland train more on dryland than players in US, should they be at better shape? I don't think so. None of the facts about developing physical skills and fitness level don't say that only dryland training develops physical level ice hockey players. Sam Bennet was drafted in first round to NHL by Calgary Flames and he couldn't do a single chin up during testing.

Do we need all the fundamental and basic skills to be a good hockey player? Ice hockey is the fastest ball sport that is played in small area covered with ice and players skate over 20 miles per hour and they should be able to skate, turn and stop at full speed. Do we need as coaches to teach players to do cartwheels when we could play small area games or train skills both off and on the ice? Players ran miles and miles all around the year but mechanics of running is not similar with skating. Most of the players think running is boring and same cardio training we could do walking with extra weight and it's healthier for joints. I think making players run 30minutes before starting actual practice is either that coach is lazy to change it or the lack of knowledge of coaches to change running for something else. Ice hockey players are ice hockey players, not marathoners. For children and juniors, skipping technique and skill training just because they need to be at high physical level doesn't develop them to be good hockey players.

Good hockey players who understands the key factors in game of hockey and who can skate head up and handling the puck, passing, deking and shooting at full speed. Periodization should be talked more at clubs and with coaches. Parents, coaches and players needs to understand what are we training and when are we training. An hour anaerobic dryland training before training speed on the ice is not an optional idea, in my opinion. Some players can do it, but are they fully recovered to perform their 100% on the ice, when they got some lactic acid in their body. Like Daniel said, physical level needs to be trained all year long but coaches need to think further than only this practice or this week.

Let say that player had a game at Sunday what was three times 20minutes period with three lines and all the lines played almost similar amount of time. Monday is an optional hour morning skate that doesn't stress muscles, but players get a lot of skill training and puck touches. Tuesday practice at afternoon starts with particular RAMP (raise of heart, activation, mobilization and potentiate) warm-up and easy core strength and on-ice is power and speed, same skill development players had on Monday morning (players should have enough time to recover from the previous game). Wednesday morning is skating endurance while playing, which can be one on one battles where players needs to protect the puck in small are (like in real game situation) and afternoon players needs to do a proper warm-up before starting on-ice practice with small area games, puck skills and playing skills. Thursday is day off where players can do either active recovery or playing fun games with their friends, for homework they can watch previous shifts from the game or watch any hockey game. Friday afternoon is game situation high tempo practice that includes the skill that has been done during whole week and after the ice is upper body strength training that is hard to do on-ice. My point is, that players don't need to be at the hockey rink 4 to 5 hours per day when they need to have something else than hockey. Junior hockey players and children are volunteer, they don't get paid and training should be fun. All hockey players love to play hockey, but they should love training and developing themselves as much. It has been told that mastering the skill takes 10 000 hours of practicing or 10 000 repetitions. Players don't learn how to shoot the puck or pass under the stick, while running in a forest. Don't get me wrong, all the skills don't need to be done at the same time. Periodization is same for skills. How many cycles are done with particular skill? Coaches want to teach all the fundamental skills in hockey in one year. Players should challenge coaches if they think that they didn't learn the topic and coach is already stepping to next topic. Of course, common sense tells that coaches can't make plans listening all the players that want to do different things. That's why coach can find out, how player can train individually and rest is up to player. Are they willing to do it individually? I admit that skills aren't trained enough in Finland. Most talented players train individually much more than common junior hockey player, which why they become so good. Ex pro players, that I have talked with, who played in NHL, there's something in common. All of them trained hundreds of hours individually or with their friends and they developed while having fun, while playing games. Genetics and talent as players hight or speed might help players to become better, but it's not the key for success. Players need to love the game and have passion for training. As a matter of fact, training shouldn't even feel like it's training because it's fun. Good learning skills and creativity are actually tools for players and coach's success. How fast they can adapt the changes of the game and how fast they learn the situations. Players and coaches with enough creativity, might even

change the game of hockey by their innovations and lead. Wayne Gretzky invented playing behind the net and to keep puck more with the team. Richard Fosbury changed high jump that nowadays athletes are jumping back first. Athletes who changed the game are even more. And they do it because they have played sports so many hours that they think differently about the sport than anybody else. As a coach, I'll recommend other coaches to encourage children to play more games and different sports with mixed rules and tasks as much as they can, if they have passion to it. If they don't have the passion, don't force them to do it. Everything develops a child if it's active moving or learning.

For next student, I would like to see a research about why players quit and how could coaches, parents and teammates prevent players quitting. For example, Finland doesn't have too many players, so could we act sooner for keeping the players playing hockey, maybe not so intensive, but still. I know many young talented players, who decided to quit for one reason or another.

Reliability of my thesis is hard to tell. It's only two examples of two different cultures and countries. Because of the Covid situation, I couldn't get any test results from coaches in Kalamazoo because they weren't that supportive and use their own time. All the time they used was to help club to start their next season 2020-2021. All results would've given more reliability for about why off-ice training is not that important, if those factors and skills are trainable on-ice.

But I think, I made it pretty clear, that both ADM and DMSP and both US and Finland have their pros and cons. Both USA Hockey and Finnish ice hockey federation should pick things from another. My thesis is good tool for coaches to get new ideas and change their mindset of coaching and expand their coaching philosophy, for players to think should they keep on playing hockey in Finland or should they follow their dreams in US. What they need to do to get there and what chances they got there. It doesn't matter where you play at, but still we as coaches have a common goal in junior hockey to develop players. We can't think that if I lose my best player to another team our season is ruined. And for clubs to develop their structure and upgrade their methods. And who knows, maybe we get more motivated coaches from USA to Finland Vierumäki to study coaching.

For next student, I would like to see a questionnaire about why players from Finland go to play in USA under the age of 18 and otherwise, is it a degree, community and culture that fascinates them or is it something else.

Something I could have done is to ask members of both USA Hockey and Finnish ice hockey federation, why they think their model and structure is better than another. And do they have any old researches about this topic. Also, gather info more from Finnish players who played their junior years in both USA and Finland. More actual info could have raised reliability. It's hard to find facts and reliable sources about player path because many of the clubs do it differently, it's hard to pick up one certain path. I tried to stay in the theme I made, but of course, I had to base my thoughts on a theory. There was huge when comparing Finland and US.

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