

Tiina Onkamo

**Adapted Physical Activity for Adolescents with Developmental Disorders –  
an electronic guidebook for sports instructors**

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Author(s) Tiina Onkamo	
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<p>Physical activity is important for everyone and especially for people who already have challenges with their health or ability to function. It has a favourable influence on adolescents' development and growth and can help people with and without disabilities to learn necessary skills to work with other people. In addition, appropriate physical activities develop moral values and offer opportunities for social interaction in a variety of environments.</p> <p>Myötätuuli Learning Environment was the commissioner of this thesis. The purpose was to produce an electronic guidebook about planning and instructing adapted physical activity for adolescents with developmental disorders for sports instructor students. The aim for Myötätuuli was to provide materials for sports instructor students and Myötätuuli employees which would strengthen their planning and instructing of adapted physical activity for adolescents with developmental disorders. The aim from the author's point of view was to gain more professional skills in adapted physical activity. From the Kajaani University of Applied Sciences' (KAMK) point of view, the aim was to provide material for sports instructor students who study adapted physical activity at KAMK.</p> <p>This thesis was conducted as a product development process which was divided into four main phases. The first was the idea-generating phase. A manuscript for the guidebook, i.e. a plan for the product, was written in the second phase. The third phase included the development of the product, the actual writing of the guidebook and taking photos for the guidebook. The product was refined according to the feedback received in the last phase.</p> <p>The end product of this thesis is an electronic guidebook about planning and instructing adapted physical activity for adolescents with developmental disorders. The guidebook includes a section of theory which discusses adapted physical activity and how it should be planned and instructed, developmental disorders and what needs to be taken into consideration in physical activities for persons with developmental disorders. In the end, the guidebook has a checklist of matters that have to be considered. In addition there are shorter checklists of the most important matters on every page of the guidebook.</p>	
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## PREFACE

“I am odd, I am new  
I wonder if you are too  
I hear voices in the air  
I see you don’t and that’s not fair  
I want to not to feel blue  
I am odd, I am new  
I pretend that you are too  
I feel like a boy in outerspace  
I touch the stars and feel out of place  
I worry what others might think  
I cry when people laugh, it makes me shrink  
I am odd, I am new  
I understand now that so are you  
I say I, “feel like a castaway”  
I dream of a day that thats okay  
I try to fit in  
I hope that someday I do  
I am odd, I am new”

Benjamin Giroux, a 10-year-old boy with Asperger’s syndrome

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## 1 INTRODUCTION

Physical activity is important for everyone and especially for people who already have challenges with their health or ability to function (Rintala, Huovinen & Niemelä 2012, 38). It has a favourable influence to adolescents' development and growth and can help people with and without disabilities to learn necessary skills to work with other people. In addition good physical activities develop their moral values and offer opportunities for social interaction in the variety of environments. (Jansma 1994, 2-3.)

Participating physical activities has a positive effect to psychological side on the wellbeing of children, adolescents and adults. Regular physical activity can improve participants' self-esteem and reduce stress, anxiety and depression. Sometimes physical activities can also have a negative picture for the participant if the participant is not skilled in physical activities. (Shimon 2011, 41.) In adapted physical activity traditional physical activities are modified to make it possible for individuals who have developmental disorders to participate safely, successfully and with satisfaction (Jansma 1994, 4). It is very important to notice the differences of individuals in the physical education of children and adolescents, because positive experiences improve to continue physical activities in their later life (Huovinen & Rintala 2013, 383).

Finnish sports act's one aim is to promote different population groups' opportunities to move and engage in having physical activity as a hobby. In addition, the sport act decreases inequality in physical activities, increases the population's wellbeing and health, promotes growth and development of children and youth as well as maintains the physical ability to function for the whole population. (Finlex 2015.)

The purpose of this thesis was to produce an electronic guidebook about planning and instructing adapted physical activities for adolescents with developmental disorders for sports instructors to use. This thesis describes developmental disorders; more specifically social, emotional and behavioural disorders; motor disorders and intellectual disability as well as some other diagnoses that are in these disorders. This thesis introduces how to plan and instruct adapted physical activity for adolescents who have developmental disorders. This thesis is focused on adolescents, because adolescents with developmental disorders can be a group that the commissioner Myötätuuli Learning Environment, will offer its services to in the future.

The aim of this thesis for the working life was to provide materials for sports instructor students who complete their practical training in Myötätuuli and Myötätuuli employees to strengthen their skills in planning and instructing of adapted physical activity for adolescents with developmental disorders. The guidebook also provides an opportunity for Myötätuuli to expand its services. The aim from the author's point of view was to gain more professional skills in planning and instructing adapted physical activity, which help the author's further studies in this field. From the point of view of Kajaani University of Applied Sciences (KAMK), the aim is to provide materials for sports instructor students who study adapted physical activity in KAMK.

## 2 ADOLESCENTS WITH DEVELOPMENTAL DISORDERS

Developmental disorder is an umbrella term for all deviances of child's development that occurs at congenital or development age. Problems can be seen in motor functions, speech development, regulation of attention and behavior as well as in learning. (Seppälä 2014.) Developmental disorders are usually recognized by an individual's slow rate of development. These disorders can be classified as specific developmental disorder (a specific learning difficulty like dyslexia) or perhaps more commonly as many disorders (general learning difficulty or intellectual disability). (Hulme & Snowling 2009.) Adolescence is the time period where difficulties in social, behavioural and emotional life most likely occur. Adolescence means a chronological stage, which is between childhood and adulthood. Adolescence is said to be between ages of 12 to 18. (Cooper 1999, 43 - 44.)

In this thesis the chosen developmental disorders are social, emotional and behavioural disorders, motor disorders and intellectual disability. These disorders were chosen from the wishes of the commissioning party Myötätuuli. In this section these developmental disorders are described briefly.

### 2.1 Social, Emotional and Behavioural Disorders

Social and emotional development disorder means symptoms that are related to disturbed social and emotional development (Heikinaro-Johansson & Kolkka 1998, 119). In addition behaviorally disordered children and adolescents are preferred as having socialization difficulties (Kauffman 2001, 6). It is usually difficult to separate in child or youth's behavior signs of disturbance of the emotional life and social maladjustment, because these signs usually are connected to each other and make a hardly defined reason and consequence relations (Heikinaro-Johansson & Kolkka 1998, 119-120). For example many behavioral disorders originate from children or adolescents' social interactions. The disorders are taught through life from learning processes that shape and maintain behavior. (Kauffman 2001, 7.)

The disorders can appear on late childhood or adolescence after years of normal development, or already on early age (Kauffman 2001, 14). Adolescence is the time period where difficulties in social, behavioural and emotional life most likely occur (Cooper 1999, 43 - 44). But when



the onset is early, children are usually diagnosed by having pervasive developmental disorder such as autism or Asperger's disorder. Some children can be diagnosed by having a conduct disorder by their behavior. (Kauffman 2001, 6 - 14.)

These disorders can appear as difficulties getting contact with other people and conflicts of emotions (Heikinaro-Johansson & Kolkka 1998, 119). People with social and emotional disorders can act in a different way than other people without these problems. This can be because they have difficulties in learning from previous situations. These people may also have difficulties in transferring this learned skill to social situations. (Rintala et al. 2012, 88.) People with emotional disorders are recognized by having noticeable problems in managing everyday situations. In addition, they act inappropriately in many situations. (Jansma 1994, 167.) Children with social and emotional problems do not always understand or misunderstand what is expected from them, and because of that they may behave in a way that is interpreted as weird behavior by others. (Rintala et al. 2012, 88.)

Attention Deficit Hyperactivity Disorder (ADHD) refers to group of neuropsychiatric disorders where the main characteristics are inattention, hyperactivity and impulsiveness. ADHD is a general disorder that decreases the ability to function. The incidence of ADHD is 5% but it varies when using different criteria. Usually ADHD is related to some other neurologic- and psychiatric disorders. (Adhd-perustietoa n.d.) ADHD includes also learning difficulties. These are, for example, difficulties in motor learning. (Rintala et al. 2012, 112.)

## 2.2 Motor Disorders

Motor disorders are quite common among adolescents but only rarely recognized (Viholainen & Ahonen 2013, 407). Motor learning disorders or more specific developmental coordination disorders refer to the difficulty to learn new motor skills and control body positions as well as difficulties in sensory motor coordination. These difficulties occur, for example, in planning a movement or the timing of a movement. This disorder makes it harder to learn skills that are needed in school or daily functions. (Viholainen & Ahonen 2013, 396.)

Clumsiness is defined as an inability to perform motor activities with acceptable competence (Sherrill 1993, 24). This means that the person's motor skill level has fallen behind from the normal level in that age (Heikinaro-Johansson & Kolkka 1998, 96). Clumsiness is connected

to sensory integration, perceptual-motor function and processing information, and it can be posed, for example by environmental limitations. These can be, for example, the delayed development of the nervous system, muscular or skeletal systems, motor coordination limitations as well as problems connected to space, equipment or allergens. (Sherrill 1993, 24-25.)

Developmental coordination disorder (DCD) is a motor disorder, which refers to significant difficulty to learn motor skills (Motoriikka n.d.). DCD can also be called motor clumsiness, motor developmental disorder or dyspraxia (Rintala et al. 2012, 111). Difficulties can occur only in rough motor skills or in fine motor skills or in both. Usually motor movements are slow and inaccurate. (Motoriikka n.d.; Viholainen & Ahonen 2013, 397.) These difficulties can disturb the person's daily life and affect the person's self-image adversely (Rintala et al. 2012, 111). DCD can be rather independent and the only developmental difficulty that the person has, but the person can also have other developmental disorders (Rintala et al. 2012, 22). Problems can occur only in motoric functions or they can be related to other learning difficulties for example difficulties in reading, mathematics or attention (Motoriikka n.d.; Viholainen & Ahonen 2013, 396). There is no coherent knowledge why problems in motor functions occur. There have been found that abnormalities of the brains structure or function might explain why motor disorders occur. (Viholainen & Ahonen 2013, 397.)

### 2.3 Intellectual Disability

In Finland there are about 40 000 people with intellectual disability (Kehitysvammaisuus 2015). Intellectual disability is one disorder of developmental disorders (Seppälä 2014). It is defined as difficulties to learn and understand new concepts. This disability limits only part of the person's functions, and everyone has different strengths and abilities. The state of intellectual disability can vary a lot, and it should not be mixed to other forms of disabilities, for example cerebral palsy or locomotion disabilities. (Kehitysvammaisuus 2015.) Reasons why people have intellectual disability vary a lot and can remain unresolved. (Rintala et al. 2012, 87). The cause of intellectual disorders can be chromosome or genetic deviance, central nervous system malformation, infection during pregnancy, alcohol use of the mother or hypoxia during labor (Jalanko 2014).

According to the World Health Organization (WHO) intellectual disability means a condition in which the development of the mental ability to function is inhibited or incomplete. The

lack of development can be seen especially in skills that affect cognitive, linguistic, motor and social skills. Intellectual disabilities can occur alone or with any other physical and psychological condition. (Kaski, Manninen & Pihko 2009, 16.) According to Jalanko (2014) people who have developmental disorders are people whose development or intellectual function has been disturbed because of congenital or later onset illness, disorder, or injury.

Intellectual disability refers to the substantial limitation of the current capacity (Itkonen 1999, 85). According to the American Association on Intellectual and Developmental Disabilities (AAIDD) intellectual disability is a disability in which people have major limitations in both intellectual functioning and in adaptive behavior. Intellectual functioning includes, for example, learning and problem solving, and adaptive behavior in selection of everyday social and practical skills. Intellectual disability arises before the age of 18. (Intellectual Disability 2013.) According to Rintala, Huovinen and Niemelä (2012, 86) intellectual disability is defined as a confined function of the nervous system. This can occur in intellectual functions or in adaptive behavior that includes conceptual, social, and practical skills.

People with intellectual disability have significantly weaker intellectual ability to function than average people. In these functions two or more limitations of adaptive skills are related. These adaptive skill limitations can be in communication, social skills, health and safety, learning ability, leisure-time and work, and acting in society. People with intellectual disability select less information in which they concentrate their doing. Intellectual disability affects individual's ability to understand the world. Their conception of the reality is simpler and more concrete than people without this disability. (Itkonen 1999, 85 - 86.)

The most common intellectual disability is Down syndrome. About 10% of people with intellectual disability have this chromosome deviance. (Rintala et al. 2012, 87.) In Finland approximately 70 children are born with Down syndrome every year (Kaski 2010). The main characteristics of this syndrome are short limbs, small head, low nasal bridge, big and flaccid tongue, withdrawn ankles and overweight. In addition heart malfunction and predisposition to cough, cold and fever illnesses are related to Down syndrome. (Heikinaro-Johansson & Kolkka 1998, 90.)

The spectrum of autism is common developmental disorders. In Europe and North-America 0.6 – 1% of the population has the disorder spectrum of autism. (Reiman-Möttönen & Mäkelä

2014, 5.) The spectrum of autism involves autistic disorder, Asperger's syndrome, Rhett's syndrome, disintegrative disorder, and extensive developmental disorder. These disorders are diagnosed according to deviant behaviour. The characteristics of these disorders, which are common for all, are abnormal social interaction and communication, unusual reactions towards sensory stimulus, and unlimited, stereotypical behaviour. (Rintala et al. 2012, 90.) In addition, the spectrum of autism can include other disorders, for example intellectual disability, speech and learning difficulties, attention deficient hyperactivity disorder or Tourette's syndrome. (Reiman-Möttönen & Mäkelä 2014, 5.)

Autism is a developmental disability that affects verbal and nonverbal communication as well as creating social interactions. Autism is usually noticed before the age of three. (Jansma 1994, 11.) Autism is not a strictly limited illness; it is a syndrome that appears in difficulties to take contact. A child with autism syndrome is not usually interested in the environment. S/he rather separates or retires away when other people are near. (Ikonen 1999, 231.) People with an autistic disorder may not speak at all or uses echo speech. Echo speech means that the person only repeats what they have heard and do not understand what it means. (Rintala et al. 2012, 90.)

### 3 ADAPTED PHYSICAL ACTIVITY

There are many names for adapted physical activity, but the name adapted physical activity is now the most used and has become the name what to use. There have been many names, which mean almost the same thing that adapted physical activity, for example: special physical education, adapted physical education, applied physical activity, and special group sports. Whatever the reason is for adapting teaching or instructing, it needs to be adapted correctly for the needs of the individual and group. (Rintala et al. 2012, 10.) Therefore adapted physical activity has its name from the system of adapting. Adaption is a process where environment and individuals change each other. (Sherrill 1993, 60.) In adapted physical activity traditional physical activities are modified to make it possible to individuals who have developmental disorders to participate safely, successfully and with satisfaction (Jansma 1994, 4).

Physical education that takes into consideration all participants' needs, readiness, and interests is called adapted physical education (Huovinen & Rintala 2013, 383). Adapted physical education is used when teaching people who have special needs towards physical activities (Heikinaro-Johansson & Kolkka 1998, 12). Adapted physical education is usually used when physical education is adapted to students with motor learning problems because of disability or long-term illness, attention deficit disorder, other learning difficulties or who have motor learning difficulties (Huovinen & Rintala 2013, 383). Adapted physical education can be also used when there are physically gifted people (Heikinaro-Johansson & Kolkka 1998, 12).

European Standards in Adapted Physical Activities (EUSAPA) say that Adapted Physical Activity (APA) is a service delivery profession and an academic field of study, which promotes the attitude of approving differences among individuals. The group also supports access to an active lifestyle and sports, and promotes innovation and cooperative service delivery and empowerment systems. Physical education, sport, recreation and rehabilitation of people with disabilities are included in APA, but according to Kudláček it is not limited to those activities. (Kudláček 2010, 7.) In Finland students have special needs when their chances for development, growth or learning are decreased because of disability, sickness, or reduced functional capacity. These students can have assistance for their learning according to their need of help. (Kudlacek & Klavina 2010, 11.)

In 1981, Erityisryhmien liikunta 2000 -toimikunta (The 2000 Commission of adapted physical activity) defined adapted physical activity as an umbrella of physical activities for people with illness, injury, or disability who have difficulties to exercise enough and use generally offered sport services or to whom exercising is meant for health issues and rehabilitation. In 1996 Erityisryhmien liikunta 2000-toimikunta adapted the definition of adapted physical activity from 1981 that adapted physical activity means activities for those who have difficulties to participate in generally offered activities or whose activities needs adaption of exercises or special knowledge because of an injury, illness, or other ability to function or act in social situation. (Erityisryhmien liikunta 2000-toimikunta 1996, 7 - 9.) In the other hand, adapted physical activity does not classify people as disabled or nondisabled. Adapted physical activity takes into consideration differences between individuals in psychomotor domain. In addition, adapted physical activity offers services for people with disabilities. The theory of adapted physical activity concerns individual differences. (Sherrill 1993, 9.)

### 3.1 Integration and Inclusion

When talking about adapted physical activity it is discussed about interaction between people with disabilities and people without disabilities in physical activity. Integration and inclusion among other terms are meant to describe the process when different people interact with each other. (Rintala et al. 2012, 216.) These concepts build up continuum towards adapted and open physical activities to all (Laaksonen & Saari 2006).

Integration in physical activity means positioning participant with special need in physical activities to general sport services or in schools to general teaching physical activity lesson (Rintala et al. 2012, 216). Integration means for people with developmental disorders full right to participate and be equal as well as taking consideration of their special need (Heikinaro-Johansson & Kolkka 1998, 16).

Inclusion means that everyone who have disabilities have right to participate fully to society's general offered services rather than participating only their own separate services. Inclusion is accepting every person as unique individual who have right to be part of the community in which s/he has born. (Rintala et al. 2012, 217 - 218.)

### 3.2 Adapted Physical Activity and Developmental Disorders

Physical activity is important for everyone and especially for people who already have challenges in their health or ability to function (Rintala, Huovinen & Niemelä 2012, 38). It has a favourable influence to adolescents' development and growth and it help people with and without disabilities to learn desirable skills to work with other people. In addition good physical activities develop adolescent's moral values and offer opportunities for social interaction in variety of environments. (Jansma 1994, 2 - 3.)

#### 3.2.1 Social, Emotional and Behavioral Disorders and Physical Activity

Adolescents who are emotionally disordered have lower fitness level than people without these disorders. Their body image and self-concept tend to be poor too. These kinds of adolescents should execute regularly activities that improve coordination, balance and motor skills. (Jansma 1994, 177 - 179.)

Children and adolescents with emotional and behavioral disorders show problems to many persons with whom they are contact with and teachers are no exception. Surprises are part of teaching children and adolescents with emotionally or behaviorally disorders. Successes and mistakes are part of teaching field. It is important to propose what behavioral disordered children and adolescents feel and look from through the child's eye. (Kauffman 2001, 15 - 18.)

Individuals, who have emotional disorders, usually have raised emotions. This can for example increase heart rate. This can be affected by allowing participants to take breaks, as needed. People with emotional disorders can have short concentration time. To make participants with emotional disorders keep their attention towards physical activities, instructor should plan several different activities in one lesson. (Jansma 1994, 171 - 172.) For example well-structured and versatile physical activity lesson serves the development of person who has ADHD (Rintala et al. 2012, 113). Participants can be taken part in planning the lesson. That can improve their attention towards the activities. When there is greater emotional disorder, the less interested the person usually is towards physical activities. That is one reason why instructor should find physical activities that are interesting for them. (Jansma 1994, 171 - 172.)

Adolescents who have behavior disorders can be touch-sensitive. Instructor should find common understanding with the participant before using touch as a tool for instructing. This can be done, for example, by discussing with the participant before touching. Adolescents who have emotional, social or behavioral disorders can have hyperactivity or hypo activity symptoms. When these symptoms occur during physical activities instructor can use relaxation and noncompetitive activities for hyperactive participants and active activities for people with hypo activity. Relaxation can include, for example, tension-relaxation practices of certain muscles. (Jansma 1994, 173 - 175.)

Adolescents with emotional and behavioral disorders can be easily distracted. To avoid this during physical activities, instructor should control all environmental stimuli. This can be done by stressing relevant stimuli and eliminating or diminishing distracting stimuli. In addition distractions can be avoid by minimizing participants' waiting time. Giving short instructions and avoiding equipment set-up while participants are waiting can minimize waiting time. (Jansma 1994, 173.)

Many persons who have emotional disorders may have poor self-image (Jansma 1994, 175). One and most important objective of the physical activity should be cementing self-image. This means that participant will understand his/her own behavior's background and accepts his/her abnormal behavior and is willing to change it. (Heikinaro-Johansson & Kolkka 1998, 121.) Instructor can try to improve participant's self-image by choosing activities that offer success quickly. In addition by calling students by their first name, can have a positive effect on their self-image. Persons with behavioral disorders may have problems in accepting change and criticism. Changes can be easier to accept with these participants when the change comes in the middle of the lesson. Instructor should start the instruction session with teacher-led exercises, then take the new exercise and end the lesson on the same exercise that they have been doing before. Last exercise can be for example relaxation. Participants with emotional, social or behavioral disorders can try to look for attention in any form. Instructor should not pay attention to unexpected behavior if possible. But when the behavior can harm someone, the instructor should intervene immediately. (Jansma 1994, 175.)



### 3.2.2 Motor Disorders and Physical Activity

There has been done only few researches of what kind of methods are good in rehabilitation for people with developmental coordination disorder and there is no strong evidence which methods are best. However practicing the skills, which have been found difficult to learn, seems to be useful. Practices should be also related on adolescent's own important and pleasant skills. Performance should be put in parts and start the practices in the easiest part and gradually proceed to harder components and to the whole performance. (Motoriikka n.d.)

Researches, which support the learning process of motor functions, has shown that learning new motor skills is hard for people with motor disorders, but it is always possible. Learning difficulties make it difficult to learn the skill independently, therefore only showing the movement and practicing independently is not enough. Learning needs many repetitions and encouraging feedback, which leads the learner to concentrate on the main point of the skill. Therefore instructor should concentrate that the feedback is correct and leads to the right technique. (Viholainen & Ahonen 2013, 406.)

Best practices for children with motor disorders are practices that take individuality into account. Also task-oriented and complete methods have had positive results. In groups, adaption of exercises should be done according to individual needs. This is a good choice if individual program cannot be done. (Rintala et al. 2012, 113.) The most important cognitive functions in regulation of motor functions are memory and attention. Keeping attention and proceeding knowledge is the field where problems in people with motor disorders have. Instructor can help the memory process by showing the model performance or using picture cards or mnemonics. These should be used a lot especially in the beginning of the learning. The changes in the environment affect a lot in the difficulty of the task. Person can for example kick a ball to the goal if the ball is not moving perfectly, but in the game it is harder because people and the ball is moving. (Viholainen & Ahonen 2013, 402 - 403.)

Especially difficult games and plays for people who have motor disorders, are games/plays in which participant has to do and observe many factors at the same time. Typical hard games are quick team sports. Adolescents, who have difficulties in motor learning, might enjoy better individual sports where skill requirements are easier to handle and they can effect on the tempo of the performance. (Motoriikka n.d.)

Motor disorders are connected with adolescents' social behavior (Viholainen & Ahonen 2013, 401). Social side of physical activities should be highlighted when completing adapted physical activity for people with motor problems. More important is that how capable the person feels them self to be rather than how capable they really are. (Rintala et al. 2012, 22.) Instructor should remember that people with motor disorders might have low self-image and tendency to depression. Therefore instructor should use tasks that are related to participant's skills. This makes it possible to create successes and build up healthy self-image and support a life-long hobby in the field of adapted physical activity. (Viholainen & Ahonen 2013, 401.)

People who are clumsy usually have poor self-image (Heikinaro-Johansson & Kolkka 1998, 96). To get positive self-concept is an important objective for the people who are clumsy. To achieve this goal, it needs to have small group size so that instructor can work with the participant individually. (Sherrill 1993, 25.) Instruction should be flexible and giving enough time to participant to do the performances. In addition instructor should demonstrate the tasks and offer alternatively tasks. (Heikinaro-Johansson & Kolkka 1998, 97.)

When person has DCD, successes in physical activities can be affected by using different kind of equipment for different kind of activities. Instructor can use softer, bigger and lighter balls to catching and hitting practices and small balls for throwing practices. In addition instructor should make distance shorter in throwing and catching practices to ease the practice. Goal area can be made bigger to offer successes. (Heikinaro-Johansson & Kolkka 1998, 56 - 57.)

### 3.2.3 Intellectual Disability and Physical activity

Children, adolescents and especially adults with intellectual disability are clearly behind in the development of muscular strength and endurance, aerobic performance, agility, balance, running speed, flexibility, and reaction time (Rintala et al. 2012, 88). That is why the instructor should assess the present level of their performance in these areas and allows participants to have rest during the physical activity lesson. Assessment can be done, for example by seeing how the participants are doing and are they tired or not. (Jansma 1994, 125.) Motor functions and conceptualization of the body of children with intellectual disability are usually developed slower than children without this disability. Many people who have intellectual disability have hypotonic muscles and many are overweight already in childhood. In the exercising program there should be exercises regarding physical condition and function when going closer to the

adulthood because these people have lower physical condition and motor performance than people without this disability. By preventing this, physical activity is very important. (Rintala et al. 2012, 88 - 89.)

The base of instructing people with intellectual disability is to know what processes have been developed and what have not. An instructor has to know in which areas the difficulties occur. (Ikonen 1999, 85.) When combining exercise and intellectual disability, instructors need to remember that a diagnosis does not tell everything, because skill levels within diagnoses can vary a lot. Cognitive ability to function can vary a lot between individuals, which can be seen in their ability to process knowledge, understand and remember. (Rintala et al. 2012, 88.) Selected practices and plays should match to participant's physical skills (Heikinaro-Johansson & Kolkka 1998, 91).

People with intellectual disability function best in activities that are concrete and easy and they learn skills best by doing (Jansma 1994, 125). Instructor should use simple activities and demonstrate the activities calmly and use multisensory approaches and instruct hard activities hand-on-hand if necessary (Jansma 1994, 125; Heikinaro-Johansson & Kolkka 1998, 91). Learning motor skills is usually difficult for people with intellectual. Therefore it is important that the learning subject is divided to parts. This division should be that it starts with easy tasks and continues to more difficult tasks. (Heikinaro-Johansson & Kolkka 1998, 45.)

People with intellectual disability can have deficient in their memory and concentration. In addition their vocabulary can be limited. While instructors are giving instructions, they should use simple words and only few of them and s/he should also demonstrate the instructions. (Jansma 1994, 126; Rintala et al. 2012, 88 - 89). In addition starting, waiting and goal places should be marked carefully (Heikinaro-Johansson & Kolkka 1998, 91). To help participants to memorize what they are expected to do, instructor should offer activities that have only few rules (Jansma 1994, 126; Rintala et al. 2012, 88 - 89). Instructor should give participants enough time to repeat the skills, but instruction periods should be short enough to maximize concentration time on the specific activity (Jansma 1994, 126). In one lesson there should be also enough different practices because people with intellectual disability seldom have enough concentration to the one specific task for a long time (Heikinaro-Johansson & Kolkka 1998, 91).

One characteristic that people with intellectual disability has, is that they are easily frustrated and they often have poor self-image. In addition their exercising motivation can be missing. This can be affected by using physical activities that offer success in the beginning. (Jansma 1994, 126; Rintala et al. 2012, 89.) When the activity seems to be boring for the participants, instructor should change the activity to keep the motivation towards exercising in the lesson (Jansma 1994, 126). If inappropriate behavior occurs in physical activities, it should ignore if it does not harm anyone. If the action harms someone, instructor should stop it immediately. (Rintala et al. 2012, 89.)

The development of appropriate social skills should be an essential part in the educational program that is designed for individuals with intellectual disability. Social skills include areas such as interaction and cooperation with others as well as self-confidence (Taylor, Richards, & Brady 2005, 246.) Interpersonal skills should be highlighted and practiced in physical activities because participant can have benefits from these skills in daily life (Heikinaro-Johansson & Kolkka 1998, 91). Collaborative plays and games are best for creating social interaction if there is no competition involved. (Rintala et al. 2012, 89.)

People with intellectual disability can do any kinds of exercises but they mostly enjoy different physical activities that are combined with music. (Rintala et al. 2012, 88.) Popular ball games for people with intellectual disability are volleyball, basketball, floor ball and boules (boccia), but they can do all ballgames according to their own skill level. Usually tactics are harder to learn than technique. Instruction should be concrete and long-term. Instruction session should start with individual practices and after those practices move to learn the game. (Rintala et al. 2012, 300.)

For person who has some disorders from the spectrum of autism, some modifications will improve the physical activity lesson. In the lesson there should be clear boundaries and enough practices. Learning environment should be appropriate. Starting and ending points of the performance should be marked clearly and instructions and guidelines should be simple. In addition, visual perception can be made better by using picture cards. (Heikinaro-Johansson & Kolkka 1998, 88.) Adolescents with autism are usually sensitive to touch. Touch can cause unpleasant and negative feelings and behavior. That can be one reason why autistic adolescents move a lot. Catching- and tag-games are unpleasant for people with autism disorder. In addition, touch that comes behind or touch that autistic person is not reserved can feel frightening. (Ikonen 1999, 233 - 235.) One typical characteristic of spectrum of autism is that they

have difficulties in social interaction. For example team games that are about social interaction and constantly changing situations are hard for people with autism. People with Asperger's syndrome need hand-on-hand instructions and lots of practicing because their functions has been automatized and it is hard to change that. (Rintala et al. 2012, 90 - 91.)

People with Down syndrome might have low physical level because of the possible heart malfunctions that are typical for people with Down syndrome. In addition they develop slower than normal in physical activities. Problems in balance are usual for people with Down syndrome because of hypermobility and inertia of the joints. In addition they might have difficulties in recognizing and distinguishing different sizes, colors and shapes of the equipment. Instructor should be extremely careful and avoid exercises where hard pressure is to head or neck, because people with Down syndrome might have hypermobility on the neck. (Heikinaro-Johansson & Kolkka 1998, 91.)

## 4 PLANNING AND INSTRUCTING ADAPTED PHYSICAL ACTIVITY

Instructing adapted physical activity follows the same paths as any other quality sports instruction or physical education. Instructing must always be adapted to the participant's unique needs. Instructing begins by becoming familiar with participants and their needs and continues with planning exercise by taking into consideration these needs. In the planning-phase instructors should think about objectives and content that is adapted to these needs. Planning includes also decision making about the equipment and environment, (Sherrill 1993, 11; Rintala et al. 2012, 53.) and teaching and assessment methods. When the instruction is clear, target-oriented and systematically implemented, it can be called structured physical education. This will help participants to detect the structure and content easier. Structured physical education is good for any adapted physical education instruction but even more for participants with developmental disorders. (Rintala et al. 2012, 53.)

### 4.1 Background of the Group

The first factor instructors should do when they starts to instruct a new group is to get to know the participants and their needs (Rintala et al. 2012 54). It is important in physical education that individuality is taken into consideration in order to provide all students the possibility to succeed and learn new skills. It is very important to notice the differences in individuals in physical education of children and adolescents, because positive experiences improve continue of physical activities in their later life. (Huovinen & Rintala 2013, 383.)

Instructors can gather the background information by a questionnaire when signing up for the group or by interviewing participants and/or their guardians or other people who are in close contact with them (Rintala et al. 2012, 54 - 55). Participant is the best source of information when instructors want to know the participants motives towards physical activities, what are pleasant types of exercises and with whom the participant wants to work (Heikinaro-Johansson & Kolkka 1998, 26). Therefore, the most efficient way to learn about individual differences and to be ready to instruct adapted physical activity is to be in contact with people who have disabilities (Sherrill 1993, 30).

Instructors should know what kind of group there is, what the age-level is and is there boys or girls or both in the group. In addition the group size, how many participants there is in the group, is important to know. (Heikinaro-Johansson & Kolkka 1998, 43.) In adapted physical activity groups are seldom homogeneous on their abilities and skills. Taking individual motives into consideration is important in instructing adapted physical activity when positive experiences are objectives of the lesson. (Rintala et al. 2012, 48.)

The base of instructing, for example, people with intellectual disability is to know what processes have been developed and what have not. Instructors have to know in which areas the difficulties occur. (Ikonen 1999, 85.) Even though it is useful for the instructors to know the diagnoses of the participants, they should remember that diagnoses does not tell everything. Instructors should get information of individuals' exact performance skills and level of development related to physical activities. (Jansma 1994, 50.)

#### 4.2 Objectives of the Lesson

After instructors are familiar with the group, they can start to think about the objectives of the lessons (Rintala et al. 2012, 55). Lesson's objectives have to be linked to the teaching group (Heikinaro-Johansson & Kolkka 1998, 43). Objectives of the lesson can be classified as psychomotor, social-emotional and cognitive objectives. Psychomotor objectives can be related to physical ability and function, condition or skills. Socio-emotional objectives are related to feelings, experiences and behavior with other people. The last objective is the cognitive objective, which means the intellectual objectives. (Rintala et al. 2012, 55.) Supporting learner's complete development is noticed by identification of each development section's objective separately (Sääkslahti 2013, 298).

One objective of the physical activity lesson is psychomotor objective (Rintala et al. 2012, 55). Psychomotor objective consist of developing physical movement skills and fitness skills that are related to being physically active for example when playing games. Movement skills are for example skipping, balance, coordination as well as fitness skills that include cardiorespiratory endurance. These all aspects are wanted in physical activity as psychomotor domain. (Shimon 2011, 36.)

Socio-emotional objectives consist of feelings and attitudes of the student as well as social skills. Socio-emotional objectives can be related for example to experience fun, develop team work, fair play and taking responsibility. Socio-emotional objectives will help participants to enjoy the moving and improve their social skills. (Shimon 2011, 37.) This objective is important in adapted physical activity, because creating positive experiences and successes will have positive impact on self-image, exercise motivation and life-long hobby in sports to develop (Rintala et al. 2012, 55). Therefore social side of physical activities should be highlighted when completing adapted physical activity (Rintala et al. 2012, 22).

Cognitive objective includes thinking and knowing for example how the movement should be done correctly. Cognitive objectives include understanding the activities what they are doing. Participants should learn for example why balance is needed, and rules of the games. (Shimon 2011, 37.)

Planning in adapted physical activity needs to take a look to the objectives that are appropriate for the individual's needs. Objectives can be divided to long-term and short-term objectives. Long-term objectives are achieved during some period of time, for example one year or one month and short-term, for example during one lesson. Short-term objectives can be used to achieve the long-term objectives. (Sherrill 1993, 11; Rintala et al. 2012, 55.)

#### 4.3 Content of the Lesson

When instructors know the group and the objectives, they can start to choose the content of the lessons regarding of the objectives and skill level of the group. Exercises that are planned to practice should be corresponded to participant's developmental phase and skill level: demanding but still creating experiences of success. While planning the content, the order of the exercises and time needs to be considered in order to make the lesson more successful. (Rintala et al. 2012, 55.) In addition instructors should think how and where, they will give instructions to participants (Numminen & Laakso 2012, 50).

Exercises that are practiced during the lesson should be planned according to the skill level of the participants (Rintala et al. 2012, 55). This means that the lesson should be planned in that way that everyone can participate and have enough and enough challenging exercises during



the lesson (Heikinaro-Johansson & Kolkka 1998, 23). Familiar routines, for example in beginning and end, help learning processes and make it easier to move from task to another. Easy and familiar tasks should be in the between of the new and difficult assignments that the interest towards the exercises remains. In addition the lesson time and order of the exercises should be thought trough. For the most of the learners, lesson that varies in intensity is good, because it offers people with poor physical condition time to rest. This can be done for example that after running play there is one calming exercise. (Rintala et al. 2012, 55 - 56.)

When giving instructions to participants, instructors should think where they are according to participants. Instructors should be like that all the participants can see and hear what the instructor is speaking or showing. Participants can be arranged for example into a semicircle. In addition instructors should think if the participants are sitting or standing or is there some factors that could distract participants. If participants have equipment on their hands, they can start to try them and pay more attention to the equipment rather on what instructors are saying. When participants are sitting they may concentrate more on instructions and the instructors can have a good eye contact with the participants. (Shimon 2011, 74 - 75.)

Two common ways to learn is by observing and listening. That is why it is important that instructors will demonstrate and tell the physical activity what they are expecting participants to do. (Shimon 2011, 79.) If participant have difficulties in understanding questions or instructions, instructors should ask only short questions and questions that can be answered by one word or nod. Given instructions should be short and clear and instructors should speak calmly. In addition, instructors can use body language for aiding the communication. (Jansma 1994, 53.)

Here is presented three areas of physical activities that are good for people with developmental disorders: games, ballgames, and musical exercises and dances.

#### 4.3.1 Games

Games make good content of the physical activity lessons because in the plays all participants can feel success (Heikinaro-Johansson & Kolkka 1998, 149). Games have big impact at physical activities in children with developmental disorders. It is good to emphasize taking part in the game rather than competition or winning. Games involve social interaction, which help

the child to learn cooperation, follow rules, wait for own turn and fair game principles. The concentration of the instructor should be on dividing participants to pairs, teams or groups. That is how anyone will not feel themselves worse than others. Games develop basic moving skills well. In addition games motivate to do and try different physical activities. (Rintala et al. 2012, 271; Heikinaro-Johansson & Kolkka 1998, 149.)

Before the game starts, instructors should think what has to be done that everyone can participate as part of the group. Regardless of the disability or special need, the play should be implemented that is suitable for everyone. By choosing games that don't throw anyone out of the game are good. Games that participants can use creative solutions are also good. In addition equipment, objectives, amount and skills of participants, space and time effect on the play. If the game does not success, the play has to be adapted. It can be adapted to one participant, part of the group or to everyone in the group. (Rintala et al. 2012, 271 - 272.)

#### 4.3.2 Musical Exercises and Dances

People with developmental disorders can do any kinds of exercises but they mostly enjoy different physical activities that are combined with music (Rintala et al. 2012, 88; Jansma 1994, 139). With musical exercises opportunity is given to experience music and self-expression (Kaski et al. 2009, 202). People with developmental disorders have problems in body conceptualization. With musical and creative physical activities people with developmental disorders can make their body awareness and control better. (Rintala et al. 2012, 282.) If musical or any other exercises are done as a group, instructors should think how everybody can participate at their own level. This will happen by giving different level options. (Rintala et al. 2012, 55.)

Objectives of dancing and musical exercises are that participants feel moving with the music, pleasant and using their own body, natural. (Rintala et al. 2012, 282.) The benefits on dance and musical exercises are that they include natural socialization and feelings in many types of music. Peaceful and music with slow tempo seems to calm down and loud and fast music makes participants more active. Music can be used also as background for various physical activities. (Jansma 1994, 183.)

It is important to provide successful dance experiences. This can be done by choosing right music and movements. Music's tempo should be clear. First instructors should use slow music

and gradually increase the tempo of the music to be faster. Easy dance steps should be used before moving to more experienced steps. In addition teaching new dances is good to teach by learning the dance in parts and then combining the parts to whole dance. (Jansma 1994, 139.)

#### 4.3.3 Ballgames

Adapting ballgames to fit for people with developmental disorders requires from the instructor, ability to see individuals' and the whole group's needs and will to plan adaptations for the game. For example, small games offer usually better opportunity for people with developmental disorders to participate in the game than whole field games. (Rintala et al. 2012, 295.) Instructors should give enough time for example to pass, throw and dribble. And these skills instructors can teach hand-on-hand. Encouraging participant is also important to get them motivated towards the game. (Heikinaro-Johansson & Kolkka 1998, 137.)

Relays can be modified that participants walk rather than run (Jansma 1994, 99.) In all activities instructor can use bright colored equipment to keep participants' concentration on activity. (Jansma 1994, 100.) When having teams, different teams should be identified clearly. This can be done for example by using different color team shirts. (Jansma 1994, 142.) Figure 1 illustrates ways how different ballgames can be made easier to play (Rintala et al. 2012, 297; Jansma 1994, 99).

Figure 1. Ways to make ballgames easier.

<b>Ballgame</b>	<b>Ways to make it easier</b>
Throwing ballgames	Throw underhand rather than overhead Use soft ball instead of hard ball
Basketball	Use low basket Limit the playing area (for example, attacker cannot go to the defender's area and other way around)
Badminton	Use low net → easier to get ball over the net High net → ball flies longer
Tennis and volleyball	Use low net
Racquet games	Use enlarged racquets

#### 4.4 Environment and Equipment

By preparing the teaching environment and equipment with the needs of the participants in mind, will improve the efficiency of the learning process of the participant's sport related skills. An environment that supports learning is made by organizing the room to be accessible and by using equipment that are appropriate for the participants' abilities and skills. (Rintala et al. 2012, 57.) Accessible physical activity environment means that it is possible to adapt to be suitable for diverse physical activities (Heikinaro-Johansson & Kolkka 1998, 62.) In addition the environment should be planned according to objectives of the lesson so that it will support the learning. A room that supports the learning process is also interesting and encourages independent moving. Choosing equipment appropriate for the learning purposes will help the learning process. (Rintala et al. 2012, 57.)

Environment can be structured by using bright colors, marking the place or having only the equipment, which will be used, at seen. Different kinds of visual cues, like cones, lines, pictures, name signs, numbers, written instructions and participants own spot marks help to picture the space and orientate attention. (Rintala et al. 2012, 57.) Clear and often repeated signs, easily seen layout of the place and safe environment is good for people with developmental disorders and makes the moving easier. Picture symbols are usually clearer than written instructions. (Heikinaro-Johansson & Kolkka 1998, 62.)

Appropriate equipment help the learning process. When choosing the equipment, instructors should pay attention to the size, weight, shape and material of the equipment. (Rintala et al. 2012, 57.) In addition instructors should decide what equipment will be used and when, how much equipment is needed and how they are placed before, during and after the activities. Also equipment's use should be planned. (Heikinaro-Johansson & Kolkka 1998, 48.) For example by choosing different balls will have an effect on the ballgames; playing with hard and small ball will need more skills than playing with soft and big ball. Throwing and catching can be rehearsed by a pea bag, because it will not run away if participant cannot catch it. (Rintala et al. 2012, 57.)

Equipment and activities can be modified to get participants participate more. In addition it can be done to the environment as well. Some environmental variables can be modified to get people with developmental disorders participate more to physical activities. Lightning can be one distracting factor that instructors should think. In addition extra lines on the floor and

different figures on the walls are distracting if they are not related on the activities that participants are having at the time. (Jansma 1994, 107 - 108.)

Figures 2 and 3 illustrate how different equipment and environment affect the game or play. (Rintala et al. 2012, 273; Heikinaro-Johansson & Kolkka 1998, 48; Huovinen & Rintala 2013, 385.)

Figure 2. Equipment and their effect on the game/play

<b>Equipment</b>	<b>Effect on the game/play</b>
Big and light ball	Gives time to react and makes the game slower
Large throwing target (e.g. goal)	Hits and goals are easier to make
Small goal (e.g. in football)	Harder to make a goal For goalkeeper: Easier to keep e.g. the ball out of the goal
Shorter stick	Easier the eye-hand coordination
Team shirts	Easier to know Who is in your team Where to make a goal Roles in the play/game
Picture guides	Easier to remember the movement
Low basket or net	Easier to get the ball to the basket or over the net

Figure 3. Space and its effect on the game/play

<b>Space</b>	<b>Effect on the game/play</b>
Clear colors	Help to notice
Marks on the floors (tape, coins etc.) <ul style="list-style-type: none"> <li>- Routes</li> <li>- Playing area</li> <li>- Movement paths</li> <li>- Places for hands and feet</li> <li>- Playing/performance spot</li> <li>- Place to listen the instructions</li> </ul>	Helps to <ul style="list-style-type: none"> <li>- Act in the game</li> <li>- Move to right place</li> <li>- Concentrate</li> <li>- Stay on the right place</li> </ul>
Changing height of the basket <ul style="list-style-type: none"> <li>- Higher</li> <li>- Lower</li> </ul>	Harder Easier
Changing distance to the goal <ul style="list-style-type: none"> <li>- Closer</li> <li>- Further</li> </ul>	Easier Harder
Taking distraction away ( e.g. extra noise, equipment that are not related to the practice)	Easier to concentrate

#### 4.5 Teaching Methods

In instructing adapted physical activity, different teaching and communication methods can be used (Rintala et al. 2012, 56). The teaching method is combination of all the components that the teacher uses to achieve to get appropriate learning (Numminen & Laakso 2006, 70). Communication includes all the actions that are needed for disseminating or receiving messages in which the teacher tries to improve learning and physical activity of the student in a physical situation. (Rintala et al. 2012, 56.) Teaching methods means the practical actions that instructors use for organizing and enhancing learning. Objectives of the lesson will have big impact on choosing the teaching style. Also other aspects, like skill level of the participants, previous experiences and external resources have an effect on choosing the teaching style. (Heikinaro-Johansson & Kolkka 1998, 45.)

Using different teaching styles can develop critical thinking, motivate participants to learn and participate, and work in the group. Teaching styles can be divided into teacher-led and student-led styles (Shimon 2011, 92). In addition, teaching styles can be divided to the reproduction of the known (A-E) and discovery and the production of unknown (F-K). These are command (A), practice (B), reciprocal (C), self-check (D), inclusion (E), guided discovery (F), convergent discovery (G), divergent production (H), learned-designed individual program (I), learner-initiated (J) and self-teaching style (K). (Mosston & Ashworth 1990, 5.) These styles are presented on the Figure 4. Eight good teaching methods for adapted physical activity lesson are the following: command style (A), practice style (B), reciprocal style (C), self-check style (D), inclusion (E), guided discovery (F), convergent discovery style (G) and divergent production style (H) (Heikinaro-Johansson & Kolkka 1998, 46 - 47).

There is many teaching styles that are good for instructing physical activities. Teacher-led styles are good when the objective of the lesson is learning new skills or that participants will do given task actively. (Heikinaro-Johansson & Kolkka 1998, 45.) Teacher-led styles are command style (A), practice style (B) and self-check style (D) (Shimon 2011, 93 - 95). Styles that are led by teacher are best for learning new things, but it is important to use also student-led styles, because they improve independent skill learning. (Rintala et al. 2012, 56.)

Student-led teaching styles are excellent when objectives are for enhancing creativity, problem solving skills, independency, and social skills of the group or changing attitudes of the participants (Heikinaro-Johansson & Kolkka 1998, 45). Student-led styles are reciprocal (peer) style (C), guided discovery style (F) and divergent style (G) (Shimon 2011, 95-99). In the same physical activity lesson, one or more different teaching methods can be used. In addition teaching methods can be mixed together. (Numminen & Laakso 2006, 80.) Instruction should include methods that participant has to face variety of different social situations, for example self-control (Heikinaro-Johansson & Kolkka 1998, 46).

Figure 4. Teaching methods (A-K) (Mosston & Ashworth 1990).

<b>Teaching method</b>	<b>Role of the teacher</b>	<b>Role of the learner</b>
Command style (A)	Teacher makes all the decisions	Learner do what teacher asks, acts as a follower
Practice style (B)	Teacher gives the task and individual feedback	Learner practices at her/his phase the task
Reciprocal style (C)	Teacher gives the task, teacher communicates only with the learner who is giving feedback	Learners do the task on pairs, another one is doing and other one is observing and giving feedback
Self-check style (D)	Teacher gives the task and assessment criteria	Learner practices the task and gives feedback to her/himself
Inclusion style (E)	Teacher gives different level practices on the same task	Learner chooses the practice according to their own skill level
Guided discovery style (F)	Teacher gives task, observes, asks questions and gives hints	Learner tries to find right answer for the task

Convergent Discovery Style (G)	Teacher gives task/problem, assess with the learner the solution	Learner searches the right solution independently and assess the solution with the teacher
Divergent Production Style (H)	Teacher gives task/problem, observes and gives support if needed	Learners produce different solutions and assess those
Individual Program - Learner's Design (I)	Teacher gives a theme, supports, directs and gives feedback if needed	Learner designs own program according to theme, does the program and assess her/his performance
Learner-Initiated Style (J)	Teacher instructs and gives feedback if needed	Learner designs own program and how it will be implemented
Self-Teaching Style (K)	Teacher supports and if needed makes sure that all the aspect have been taken into account	Learner on responsible of choosing the task and the whole learning process.

#### 4.6 Assessment Methods

The last thing to do during and after the lesson is to assess the results according to the objectives (Rintala et al. 2012, 58). Assessment is a term used to describe the process of measurement and evaluation. (Shimon 2011, 158). Assessment is relevant in the process to determine the benefits of the program (Jansma 1994, 443). This can be accomplished after the learning period, after every lesson or after some skill performances. Assessment can be performed during lesson using systematic and unsystematic styles. (Rintala et al. 2012, 58.) Instructors should assess both weaknesses and strengths of the participant (Jansma 1994, 417). Assess-



ment can be performed also by testing. Tests can include for example testing motor development, skill learning and physical condition. After all the knowledge has been gathered, instructors can start to make plans for the future. (Rintala et al. 2012, 58.)

During the lesson, instructors should make assessments if the lesson is going as planned (Heikinaro-Johansson & Kolkka 1998, 53). In physical activity lessons, systematic and unsystematic styles can be used for supporting assessment. Unsystematic observation means that instructors observe participants generally and can give feedback to participant according to the observations. Systematic observation means, on the other hand, that instructors will check everybody's performance on a specific task and then give feedback. (Rintala et al. 2012, 58.) If chosen practices do not serve the objectives, instructors should change or try to instruct it to the right direction. This can be accomplished, for example, by giving feedback. (Heikinaro-Johansson & Kolkka 1998, 53.)

Feedback describes the information related to conclusion of execution, response, behavior, attitude or performance itself. The purpose of the feedback is to maintain or change performance, answer, behavior, attitude or the result of the performance. (Numminen & Laakso 2006, 63.) In addition, feedback helps participants to be motivated on what they are doing as well as improve their performance (Shimon 2011, 84).

## 5 RESEARCH TASK

The purpose of this thesis was to produce an electronic guidebook about planning and instructing adapted physical activity for adolescents with developmental disorders to be used by sports instructor students.

The aim of this thesis for the working life was to provide materials for sports instructor students who complete their practical training in Myötätuuli and to Myötätuuli employees to strengthen their planning and instructing of adapted physical activity for adolescents with developmental disorders. The aim from the author's point of view was to gain more professional skills in planning and instructing adapted physical activity, which will help the author's further studies in this field. From the KAMK point of view, the aim is to provide material for sports instructor students who study adapted physical activity in KAMK.

The research questions of the thesis were following:

What characteristics a clear and comprehensive electronic guidebook have?

How social, emotional and behavioral disorders, motor disorders and intellectual disability affect planning physical activities?

How adapted physical activity can be effectively instructed to adolescents with developmental disorders?

## 6 PRODUCT DEVELOPMENT PROCESS

This thesis was carried out as a functional thesis, which is one option for a thesis in the University of Applied Sciences. A product development process is one form of a functional thesis where the end product of the thesis is a product, for example, a guidebook. The product can be published as a book, booklet, guidebook, portfolio, web pages or event depending on the target group. (Vilkkä & Airaksinen 2003, 9.)

A high quality and long-running product arises from product development process. The product development process includes five main phases, which are needed to finish the product. The product development process starts with finding a problem or area to develop. After the problem has been found, idea-generating phase continues. The idea-generating phase includes the idea how to solve the problem or how the area can be developed. After these phases is a planning phase and a development phase of the product. The last phase is refining the product. (Jämsä & Manninen 2000, 16; 28.)

The product created in this thesis is an electronic guidebook for sports instructor students who complete their practical training in Myötätuuli or study at KAMK and for Myötätuuli employees. The guidebook includes a section on theory, which describes adapted physical activity and ways how adapted physical activity should be planned and instructed, developmental disorders (social, emotional and behavioral disorders, motor disorders and intellectual disability), and what factors should be taken into consideration when planning and instructing different physical activities for adolescents with developmental disorders. On the last page, the guidebook has a checklist about the most important guidelines to remember. In addition, there is smaller checklists on every page of the guidebook highlighting the most important guidelines.

In this thesis, the product development process was divided to four main phases. The first phase was idea generating. The second phase was planning the product, which included writing the manuscript of the guidebook. The third phase included the development of the product, the actual writing of the guidebook and taking photos for the guidebook. The last phase included refining the product according to the feedback. In the Figure 5 can be seen the times and the order of product development process in this thesis.

Figure 5. Product development process



## 6.1 Idea Generating Phase

The product development process starts with noticing problem or need of development and starting the find the idea of how the problem can be solved or development can be made (Jämsä & Manninen 2000, 28). The idea generating phase started when the author had her practical training in Myötätuuli in spring 2015. One of the group that author instructed was the SISU group. In the SISU group there were adolescents with different developmental disorders. Author liked to instruct this group a lot and at the same time thought how planning and instructing of this group could be better. Author decided that she wants to do the thesis in the field of adapted physical activity.

When the thesis process started in September 2015, author contacted Myötätuuli if they have need for thesis in the field of adapted physical activity, for example, a guidebook for SISU group instructors. The topic was necessary for Myötätuuli because they don't have any guidebooks related to this topic and with guidebook they can make their services wider. Sports instructor Sanna Pakkala-Juntunen was chosen to be the supervisor from the Myötätuuli. When author met Sanna, they discussed about the content and to whom guidebook is guided, because SISU group is not existing anymore. Guidebook will be an electronic guidebook, which will include theory of planning and instructing adapted physical activity as well as theory of developmental disorders. The developmental disorders that were chosen were social, emotional and behavioural disorders, motor disorders and intellectual disability. The language of the guidebook was decided to be Finnish. After these decisions had been decided, the commissioning agreement with Myötätuuli about the product was written.

## 6.2 Planning Phase

In the planning phase the actual launch and mission statement of the product is decided (Ulrich & Eppinger 2004, 13). Planning can be started when the decision of the characteristics' of the product is done (Jämsä & Manninen 2000, 43). In this state the content of the product was chosen and the commissioning agreement about the product with Myötätuuli was done. In the planning phase many factors such as the factual content of the product, service producer, resources, professional knowledge, values and principles, operational environment,

statutes and regulations, interest group and client profile should be taken into consideration (Jämsä & Manninen 2000, 43).

The client is always the base of the product development process (Jämsä & Manninen 2000, 16). The planning started with getting information on what are Myötätuuli's expectations for the guidebook. In the beginning of the product development process, it is useful to research the needs of the client (Jämsä & Manninen 2000, 20). Myötätuuli told about their wishes on the content of the guidebook, especially the developmental disorders. Getting the opinion from the client gives an opportunity to create a customer-oriented and desired product (Jämsä & Manninen 2000, 21). Myötätuuli wanted that the developmental disorders, which are discussed in the guidebook, were social, emotional and behavior disorders, motor disorders and intellectual disability. These developmental disorders were selected because children and adolescents with these disorders can be one group to whom Myötätuuli offers their services.

In the planning phase factors such as costs and resources are decided (Jämsä & Manninen 2000, 51). In the commissioning agreement where decided that there are no any special resources needed. Myötätuuli as a resource could be used when necessary and when the author takes contact to them during the product development process. Also the teacher supervisor can be considered as a resource to help the author during the process. Other resources such as facilities and equipment could be used for free. The author had access to KAMK facilities and have her own camera for photographing and performed the photographing herself. In photographing, adolescents were needed to photograph, in order to make the pictures of the guidebook more accurate. Because the guidebook is on electronic form, there were no production costs in making the guidebook. The InDesign program was decided to make the guidebook because commissioner suggested that.

In the planning phase, a lot of other guidebooks were seen in the field of adapted physical activity to see what kind of guidebooks are existing. In addition, the theory about adapted physical activity was read to be able to plan what was useful to have in the guidebook. Clarifying the product's factual content requires getting familiar with the topic (Jämsä & Manninen 2000, 47). After the information about what the guidebook should include was gathered, the product manuscript was written. Manuscript included a plan what will be written on every-page, and headlines and pictures. In all phases of product development process feedback and

assessment is needed (Jämsä & Manninen 2000, 80). After the manuscript was written feedback from commissioner was collected about the manuscript. Myötätuuli gave positive feedback and also some guidelines about the outlook of the guidebook.

It is necessary to know the regulations, instructions and plans of the organization which will use the product, because organization might have values or principles that the product should serve (Jämsä & Manninen 2000, 49). When discussing the guidebook's manuscript with Myötätuuli, they said that the color of the guidebook should be green, because green is the color of Myötätuuli. In addition, their logo should be in the first page of the guidebook. Alignments of the commissioning party have to be taken into consideration when the style and content of the product is chosen (Jämsä & Manninen 2000, 49). Myötätuuli said that the font and the size of the font for the text in the guidebook has to be found from the literature.

By choosing the right typography and font size to the guidebook will make it easier to read (Vilkkä & Airaksinen 2003, 52). Typography describes how the text is designed. The meaning of typography is to present the text in interesting, readable and appealing way to the reader. The headlines and highlighted texts should be written in the most interesting way. The main text should be easy to read and the text should be also appealing. Appealing denotes that the outlook of the text does not irritate anyone. Calibri is a good font for the actual text of the guidebook and Cambria for the headlines. These fonts are planned to look good both on paper and screen (Korpela 2010, 10 - 12; 87.) In this phase those fonts were chosen for writing the guidebook.

In the planning phase, the content of the photographs were decided. Photographs should include adolescents with developmental disorders while they are having physical activities and different equipment. Myötätuuli had one group of adapted physical activity starting but the participants were young children, therefore they did not fit in the target group of adolescents. Also one project group in KUAS doing a project about a sport event in adapted physical activity but the project was still in an idea generating phase, therefore they did not know when the event is. Therefore photographs include only equipment and environment where the instructions will happen in the future.

In the planning phase, information how the guidebook should be made was also researched. In the thesis plan phase author had chosen to use Ulrich' and Eppinger's (2004) theory of how to create the product. However, for doing the product, Jämsä and Manninen's (2000)

theory of doing the product was chosen. In this book there were better guidelines for making the product in the field of sports and health.

### 6.3 Development Phase

After the planning phase, the development phase continues according to the chosen factors and principles (Jämsä & Manninen 2000, 54). When the guidebook was planned, the actual writing started. In this part, more information from the literature was gathered to make sure that there is enough information for a comprehensive guidebook. The most essential content consist of the facts that are described precisely, comprehensible and taking into account target group's need of knowledge (Jämsä & Manninen 2000, 54).

In the planning phase, the InDesign program was decided to use to create the guidebook, because commissioner suggested it. They already had some electronic guidebooks created with InDesign program. During the development phase, the InDesign program was not decided to use to create the product, because there was no enough time to learn how to use it. The Word program was decided to use to create the guidebook because it was familiar program for the author and the concentration was more on the content of the guidebook rather than learning how to use a new program.

The first version of the guidebook was written in the end of March. In this version different developmental disorders and their effect on physical activity, and planning and instructing adapted physical activity were written. In this version there were no pictures because the photographs were not taken yet. Also different physical activities and their adaptation were not yet written in the guidebook and author had not concentrate on the outlook of the product.

The development phase is the best phase to do a road test or a pre-test of the product (Jämsä & Manninen 2000, 80). After the first version was written, it was sent to supervisor from the commissioner to get feedback about the guidebook. The feedback was asked to concentrate on the content of the guidebook and if the content is written according to commissioner's needs. Commissioner gave positive feedback of the content of the guidebook. The content included factors that commissioner asked for, but in the guidebook, there were still some parts missing which should be added, for example structure of the lesson. In addition, feedback



concerned also the linguistic form. In the guidebook, there were too many repetitions of certain words, therefore more thought should be in the linguistic form of the guidebook.

In the first version, the layout of the paper was portrait. It did not look very appealing and it was difficult to get all the necessary things on the same page in readable way. Therefore the layout was decided to change from portrait to landscape. In the landscape version, there are two columns on one page that the reader could read the page easily and get all the necessary information, for example, of motor disorders and their affect to physical activities.

After the feedback, the changes were made and the guidebook was finished according to the feedback from the commissioner. After finishing the writing of the guidebook, the photographing was performed. In the planning phase, it was planned that the photographs include adolescents who have developmental disorders. There were no adolescents who to photograph. Therefore photographs include only equipment, environment and some author's friends.

The photographing was performed in the sports hall of KUAS. Photographs were taken during two days. At the first day, photographs of the equipment that can be used for instructing adapted physical activity were taken, and also photographs of how the game area can be marked clearly. Instructions on what equipment can be used and how to mark the play area, author found from the literature. On the second day, photographs of author's friends were taken. Photographs were taken on the way that only legs are showing. Therefore, people who read the guidebook cannot know who the people in the guidebook are. Pictures with people was wanted into the guidebook to make the guidebook more appealing and realistic. After the photographs were taken, they were placed into the guidebook.

After the guidebook was ready, the guidebook was sent to author's friend Roosa Suomalainen who studies Finnish in the University of Helsinki to check if the language was appropriate and there were no big writing mistakes. The feedback was positive, but there was also a couple of mistakes. The mistakes were corrected and the guidebook was sent to commissioner, teacher supervisor and peer supervisor to get feedback to make the final refining.

#### 6.4 Refining Phase

When the product, after all phases is ready, starts the last phase of finishing the product. In the refining phase, refining is done according to the feedback and pre-testing. Refining can include, for example, refining the details. In all phases of the product development process feedback and assessment are needed. Feedback can be gathered from the commissioner and clients. The feedback from them can be too encouraging because they are already familiar with the product from the planning phase and have told their own opinions. Therefore, it is good to gather feedback also from people who will use the product in the end and do not know the product yet. (Jämsä & Manninen 2000, 80 - 81.)

The best situation would have been that the product would have been tested of people who use the guidebook. Feedback could have been gathered from the sports instructor students, because they are the group who will use the guidebook in the future. However, this did not happen because there was not enough time to do it. Therefore the feedback came only from the commissioner, teacher supervisor and peer supervisor.

The commissioner, teacher supervisor and peer supervisor gave positive feedback from the guidebook's content and outlook. The guidebook was written well, it looks professional and it is easy to read. There were some small corrections for making the reading of the guidebook better. These corrections were made and the guidebook was finished.

The refining phase also includes planning the distribution of the product which includes marketing (Jämsä & Manninen 2000, 81). The guidebook created in this thesis is designed to be used by sports instructor students and Myötätuuli's employees. There were no factors decided according to marketing in the commissioning contract. Therefore, marketing of the product was handed over to commissioner. In the commissioning contract was decided that the guidebook will be presented after the refining has been done.

## 7 DISCUSSION

The purpose of this thesis was to produce an electronic guidebook about planning and instructing adapted physical activity for adolescents with developmental disorders to be used by sports instructor students. The guidebook had to be clear and comprehensive and should help sports instructors and Myötätuuli employees to plan and instruct physical activities for adolescents with developmental disorders. The product development process was divided into four main phases: idea generating, planning, development and refining phases.

Limiting the subject of the thesis is prerequisite for finding an interesting problem (Metsämuuronen 2009, 37). The idea-generating phase was successful: the topic was interesting for the author and it was also needed. The topic was interesting for the author, because adapted physical activity is the field in which the author wants to work in the future. The guidebook was needed for Myötätuuli, because they don't have any guidebooks related to adapted physical activity, and adolescents with developmental disorders can be one group to whom Myötätuuli offers their services.

On the other hand, the subject could have been limited better in the idea-generating phase, because the subject came quite wide for one person to write. Author could have got less developmental disorders into account, but because the chosen developmental disorders were wishes from the commissioning party, author decided to take them all.

In the planning phase, InDesign program was decided to use for creating the guidebook. Creating the guidebook with InDesign program would have been too time consuming, because the author haven't never used it. There would have been enough time to do the guidebook with InDesign-program if author could have started to learn how to use the program earlier. Therefore author chose to do the guidebook with Word program, which is familiar for the author. This is how author could use more time on the content of the guidebook rather than how to use the program.

Choosing the content and how much text is enough in the guidebook was challenging. To choose the content and the amount of it, is a common problem to all products that provides information. As well as that there is a possibility that knowledge can be changed or updated is one problem. (Jämsä & Manninen 2000, 54.) Because the purpose of this thesis was to produce a guidebook about adapted physical activity and provide information, it was difficult

to know if there was enough information written into the guidebook. A lot of information was researched to find out what are the most important directions of adapted physical activity. These directions made the content of the guidebook.

This thesis and product development process started early enough that author could finish the thesis and enough time to execute the guidebook in time. Author had enough time to write the thesis and the guidebook. There was no hurry in any point of writing the thesis even though the timetable for doing the thesis and guidebook was quite strict. The author managed to keep the timetable that she had planned, which allowed the author to have enough time to write the thesis and create the guidebook.

During the planning phase author looked quite many other guidebooks in this field of study. Author found some herself and commissioner showed also some guidebooks what are done for them before. This gave some ideas for the author of what kind of guidebooks commissioning party is asking for. Author gathered also feedback from Myötätuuli that the guidebook would be right for them. Getting the opinion from the client gives an opportunity to create a customer-oriented and desired product (Jämsä & Manninen 2000, 21). The feedback concerned on the content of the guidebook. Feedback was mainly good, but author had to concentrate more on the linguistic form of the text and add structure of the lesson. Feedback helped a lot to know that the guidebook was pleasing the commissioner and going to the right direction.

The planning phase of the product could have been more accurate. It is important and useful to familiarize to the literature of the subject (Metsämuuronen 2009, 39). More information, for example, scientific articles and books of adapted physical activity could have been collected before starting to plan the guidebook. Because the plan was simple and quite shortly written, more time was used for writing the guidebook. Author's manuscript of the guidebook was quite short, but it gave the main picture what the guidebook would include. In the end product, the headlines were quite different than in the manuscript. Headlines and the content were changed because author got more information from the literature. More information of developmental disorders and how to plan and instruct adapted physical activity could have made the planning phase more accurate.

The guidebook could have looked more appealing. More time could have been used on the outlook of the product. Because the time was limited to finish the guidebook author did not

used too much time on the outlook of the guidebook. If there would have been more time, author could have asked someone who studies graphic design to help on the outlook of the guidebook. Because the content of the guidebook was more important than the look of the product, most of the time was used for the writing the content of the guidebook. The guidebook was produced for sports instructor students to use as a tool for planning and instructing adapted physical activity. For this reason the emphasis was on the content of the guidebook rather than the look of it. However, the outlook is quite appealing and the guidebook is easy to read.

For photographing, more places could have been called for taking the photos. There was limited amount of groups in Kajaani in the field of adapted physical activity for adolescents with developmental disorders. Also the time of creating this guidebook was limited. Therefore one place for taking the photographs was excluded.

With more pictures the guidebook would have looked more appealing. In addition, the photographs could have been planned beforehand because now taking the photographs took quite long time when performing the photographing. Pictures could have been drawn into the paper or written what the pictures should include. Now the wanted pictures were just listed into the paper. If pictures have been planned beforehand, the photographing would have not taken too long time.

Author's own digital camera and phone was used for taking the photos. Therefore the quality of the pictures was not very good in the guidebook. Better camera could have loaned from author's friends to make pictures more high quality. In addition, a real photographer could have been asked to take the photographs, if the photographs have been the key issue of the guidebook. Because the photographs in the guidebook were only giving more appealing touch and introducing some equipment, the pictures do not have to be high quality photographs.

The connection with the commissioning party was continuous throughout the thesis process. Because the author is studying in KAMK and Myötätuuli is located in KAMK facilities, it was easy for the author and commissioner to keep contact and meet when necessary. The feedback and help was easily asked from the commissioner. The communication with teacher supervisor was also helpful during the whole thesis process. Author could ask help from the teacher supervisor about the thesis process and also in other aspects, for example for the language.

Teacher supervisor could help with the language as well as in the content problems. The good connections made the process fluent.

## 7.1 Product Evaluation

In the evaluation of the functional thesis, it is very important to discuss if the aims of the thesis were achieved (Vilkkä & Airaksinen 2003, 155). For the commissioner, the aim was to provide materials of adapted physical activity for sports instructor students and Myötätuuli employees. It was significant that the product serves the needs of the commissioner. It is good to ask evaluation of the product from the target group to support the own product evaluation (Vilkkä & Airaksinen 2003, 157). The guidebook could not be tested because the time was limited. However, in the product development process, needs and wishes of the commissioner was taken into account in all phases to make a good product for the commissioner. Planning and executing the product according to the target group, serves the target group best (Vilkkä & Airaksinen 2003, 51).

The product evaluation was done by critical thinking of the author, commissioner, and teacher supervisor. During the planning phase the author took into consideration what the commissioning party wishes to have in the guidebook and what literature suggested. To make the guidebook reliable, the theory of the production process and theory used in the guidebook was critically examined by using source criticism. Author used mainly recent sources, which made the guidebook more reliable.

The author was mainly satisfied with the finished product. The guidebook serves the commissioner, and in the guidebook there is the most important factors that instructor should remember while planning and instructing adapted physical activity for adolescents with developmental disorders. Only the outlook of the guidebook would have been made to be more appealing. Searched information was used when writing the guidebook and also what characteristics make a good product was taken into consideration. For example, the guidebook created in this thesis is good because it is made according to commissioner wishes and needs, and the information in the guidebook is carefully examined. In addition author used well-known process for making the actual product.

One major part of the product evaluation is that the commissioner is satisfied with the product. Commissioner gave positive feedback and told that they are satisfied with the product. Therefore can be said that the product was successful.

## 7.2 Ethicality and Reliability

Before starting to write the thesis, the author made a commissioning agreement with the commissioner Myötätuuli. In the agreement the objectives, resources and a copyrights of the product were decided: Myötätuuli has all the rights of the completed product. Because there are photographs in the guidebook, the author asked the permission to take the photographs from those who were in the photographs.

In the thesis, the age of the source has to be critically examined (Vilkka & Airaksinen 2003, 72). Because author wrote the thesis on her own, she had to be critical for example towards the sources what she used to ensure the success of the thesis. One way how the reliability of the thesis was ensured is that author used source criticism. Sources can be evaluated first on what is the authority and awareness of the source, age, quality and credibility. Using known and recognized experts' recent and current material is usually a safe choice. It is also good to have original sources rather than secondary sources because those are always interpretations of the original source. (Vilkka & Airaksinen 2003, 72.) However, an old source not necessarily mean that the information is outdated (Metsämuuronen 2009, 29). Author used mainly new sources. Some of the sources that author used were quite old, but the theory of this subject has not changed. Author used searched methods for doing the product and well-known sources when writing the theory.

## 7.3 Professional Development

Expressing own know-how, cooperation, developing working life and management of unity are parts of professional growth (Vilkka & Airaksinen 2003, 159-160). This thesis developed the author's expertise in the competences of physical activity, health promotion and coaching, and pedagogy and didactics (Description of Competences n.d.) as well as searching information and using it effectively. The author's knowledge in planning and instructing adapted

physical activity developed and her knowledge in special needs education increased. This thesis improved the author's understanding of various physical activities as tools for developing motor skills, physical qualities, and self-expression with adolescents who have developmental disorders. In addition, the author's understanding of how these disorders affect development and social behaviour improved, because author read a lot of this topic when writing the theory of this thesis. Finally, this thesis supported the ability to use and assess different teaching methods when planning and instructing adapted physical activity, because author deepened her knowledge while writing the theory.

The competence in physical activity was improved during the thesis process. The author's ability to manage the fundamental knowledge and skills required in the most common physical activities and to apply them when instructing different target groups, especially adolescent with developmental disorders increased. This thesis supported the author's demonstration of the procession of fundamental knowledge required in special needs education and understanding of the value of various physical activities as a tool for developing motor skills, physical qualities, and self-expression, especially how different physical activities will develop motor skills, physical qualities and self-expression with adolescents who have developmental disabilities.

Also competence in health promoting physical activity and coaching was improved during the thesis process. This thesis supported author's competence in the mechanisms of physical activity and lesson planning skills for adolescents with developmental disorders and gave proficient knowledge of the factors affecting human growth, development, and social behavior as well as the ability to take them into consideration during physical activity, especially how people with disabilities behave and how to take it into consideration when planning physical activity. In addition, the author's ability to plan and instruct health promoting physical activities for adolescent with developmental disorders improved.

In addition, this thesis supported the competence in pedagogy and didactics. The author's ability to use a variety of different teaching methods with different target groups developed, because author read a lot of searched information of how different teaching methods can be used and to what kind of a group. The author knows now the importance of different teaching methods, for example that the lesson should start with teacher-led styles. Professional devel-



opment increased because the author learned the importance of using different teaching methods for different groups, for example that not all the teaching methods can be used for adolescents with developmental disorders.

One important part of this thesis process was to learn of how to get information effectively and how product development process goes. The author learned to search knowledge from different sources. When searching knowledge of different developmental disorders and planning and instructing adapted physical activity, author improved her knowledge and professionalism in that field. Therefore the author have an opportunity to give more effective instructions in adapted physical activities. The product development process also gave experience of planning and creating a product for the working life. The author believes that all factors that she has learned during the thesis process will benefit her when moving into working life.

#### 7.4 Further Development

The ideas for further development of this thesis and the product came from the ideas that were created during the thesis and product development process and which could not be completed in this thesis or in the guidebook. The author executed the thesis alone therefore the time was limited and the thesis would have been too wide if the author have done all the extra wishes from the commissioner. Commissioner wished that the guidebook should include how to plan and instruct adapted physical activity and description of social, emotional and behavioural disorders, motor disorders and intellectual disability and their affect to physical activities. These all are included in the guidebook. Commissioner wished also during the product development process that in the guidebook there should be guidelines for doing a year plan. This author could not put into the guidebook, because of the time limitations and it would have been too wide for one person.

One further development idea for this thesis and the guidebook would be to add also how to plan the year plan of what adolescents with developmental disorders should have in the physical activity lessons in every lesson. Commissioner would have liked to have this year plan also in the guidebook. If the author would have added the year plan into the guidebook, it would have been too wide for one person to write. Therefore, this is a good further development idea.

Another further development idea would be to test the guidebook. The author did not have time to test the guidebook that if it is really helping students to instruct and participants to success. This could be done as a research in the KAMK or in other schools as well. The research could be done by an interview process or by a questionnaire. The guidebook could be sent to other schools to get a wider picture of if the guidebook is helping students. If the guidebook will be sent to other schools, a questionnaire would be better that researches do not need to go to other schools. After getting the feedback from the instructors that have used the guidebook, changes could be made into the guidebook.

The last further development idea would be to create the guidebook for different target group. In this thesis the target group was adolescents with developmental disorders. The second guidebook could include instructions of how to plan and instruct adapted physical activity to people with locomotion disabilities or for people who are deaf or blind. This would wider the knowledge of students at KAMK and Myötätuuli employees and make planning and instructing of this target group better. This would, for example, allow sports instructor students to have wider understanding of instructing physical activities for his target group.

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