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TWIN-STICK EXERCISING - ARGUMENTATION OF THE INNOVATION AND FEEDBACK RELATED TO EUROPEAN LEVEL DISSEMINATION

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The aim of this thesis was to theoretically argue and give reasons for the innovative idea of Twin-Stick Exercising. The innovation was born during the author's physiotherapy studies at Satakunta University of Applied Sciences in Pori, Finland. This thesis is a part of Research and Development activities of Satakunta University of Applied Sciences.

Twin-Stick Exercising focuses on working in pairs, and enhancing the social interaction. It offers a new variation in the field of physical activity that can be used in adapted physical activity (APA), physiotherapy and group exercising. The programme demonstrates an innovative way to utilize two sticks in exercising or even dancing, and presents a new way to enjoy rhythm and facilitate movement together with a partner. In this thesis the innovation was argued from historical, didactic, physiotherapeutic, and dance point of views.

The practical part of the thesis was carried out in European Congress of Adapted Physical Activity (EUCAPA) in May 2012. The idea was shared for the first time in public. Thus the EUCAPA congress was a starting point for European level dissemination. The presentation was videoed by The Inclusion Club experts, and the author of the thesis was interviewed for The Inclusion Club website. Additionally, the idea of Twin-Stick Exercising was noticed in the SoveLi ry's newsletter and Finnish journal of physiotherapy.

The adaptation possibilities were discussed, and instant feedback was collected from the participants after the congress presentation. Later on, a small-scale feedback survey was sent to participants via email. According to the feedback, Twin-Stick Exercising is considered as joyful exercising and adaptable idea. The outcome of this thesis was the supportive feedback obtained, which resulted to future plans such as own business idea and international cooperation.

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1 INTRODUCTION

Musculoskeletal problems, cardiovascular diseases, and depression are among the most common public health problems in Finland nowadays (Website of The National Institute for Health and Welfare 2012; Website of Terveyskirjasto 2012). Physical activity plays an important role in their prevention (Rintala, Huovinen & Niemelä 2012, 116; 159-162; 190-192). Therefore, it is important to support active life style and create new methods. Twin-Stick Exercising offers a variation in the field of physical activity, and its primary target groups are working aged adults and people with special needs. The basic concept can be implemented both in group activity and private instructional settings.

According to Finnish Sport Federation, gymnastics and dance are included in the most popular sports among the working aged adults in Finland (Suomen Liikunta ja Urheilu SLU ry: Kansallinen liikuntatutkimus 2009-2010 Aikuis- ja senioriliikunta 2011). The modern group training classes are mostly carried out individually even though the participation occurs in a group, for example in gymnastic exercise, aerobics, Zumba, and the Les Mills group fitness classes (Website of Les Mills 2011; Website of Zumba fitness 2012). In this thesis, the innovative idea of Twin-Stick Exercising focuses on working in pairs, thus relying more on social interaction.

Influences of dance make Twin-Stick Exercising more rhythmic and dynamic than the traditional stick exercises. In this thesis, the innovation is explored from didactic, physiotherapeutic, and dance point of views. Moreover, the adaptation possibilities are discussed. Exercising with the stick itself is not a new innovation, but it has been used mostly individually even if in a group activity. The aim of this thesis is to present and theoretically argue the innovated exercise programme.

This thesis includes features of two different thesis types: research type and thesis focusing on operational aspects (Vilkka & Airaksinen 2004, 9-10; Website of Satakunta University of Applied Sciences 2009). Practical presentation of Twin-Stick Exercising at European Congress of Adapted Physical Activity (EUCAPA) in

Ireland refers to operational aspects. The congress was also the starting point for the European level dissemination of the innovation.

Additionally, a free formed email feedback questionnaire based on the congress presentation and its analyses were carried out. Thus, this thesis focuses on research as well. The purpose of the feedback survey was to obtain a comprehensive picture on how Twin-Stick Exercising was experienced by the congress participants. Therefore, the qualitative questionnaire was employed as data collection method. (Vilkka & Airaksinen 2004, 63.) The content of the feedback analyses is presented by using both quantitative and qualitative methods to describe the results (Hirsjärvi and Hurme 2000, 32). In conclusion, the outline of this thesis builds on four phases of the process that determined the content of this work (Figure 1).

Figure 1. Elements of the thesis in chronological order.

2 PROGRESS AND AIMS OF THE THESIS

The innovation of Twin-Stick Exercising was born during the author's physiotherapy studies at Satakunta University of Applied Sciences in Pori, Finland. The particular course was Didactics of Physical Education (Module: Instructing and promoting physical activity) lead by senior lecturer Tarja Javanainen-Levonen, PhD in sport sciences. In the course the task was to plan a physical activity session for working aged adults without any particular need for support in physical activity.

The general theme of the session was "exercising with the stick". Both warm up and cool down were carried out with plastic exercising sticks, and the strength training

part with the help of Gym Sticks. The author's task was to plan the warm up part for the session. The lecturer inspired to use two simple, traditional sticks in a new, innovative way. Thereafter, the movements were further developed and the exercises planned to be carried out in pairs. In the first implementation the two sticks were in different colors (blue and yellow), and the name of the color was used instead of left and right in guidance. The warm up was carried out with music and included influences from dancing. The session was rousing and received an enthusiastic reception. All in all, the innovation was developed mainly by combining author's skills of dancing, knowledge of physiotherapy, and experience of group fitness instructing.

Later during the thesis process more thorough analysis and argumentation for the innovation were considered. The several ideas of possible adaptations were developed and adapted physical activity (APA) became essential in this context. This led to further development of Twin-Stick exercising as a contribution to the subject of the Bachelor's thesis.

Deeper analyses of the innovation resulted in submission of an abstract for a congress on APA. Twin-Stick exercising was accepted as a practical presentation in the EUCAPA 2012 congress, and shared in public. Moreover, participation in the congress led to dissemination of the idea both on European and national level. Modification options for persons with need of extra support in physical activity were discussed later on and partly based on the feedback received from the congress participants. Figure 2 illustrates the phases of the thesis project.

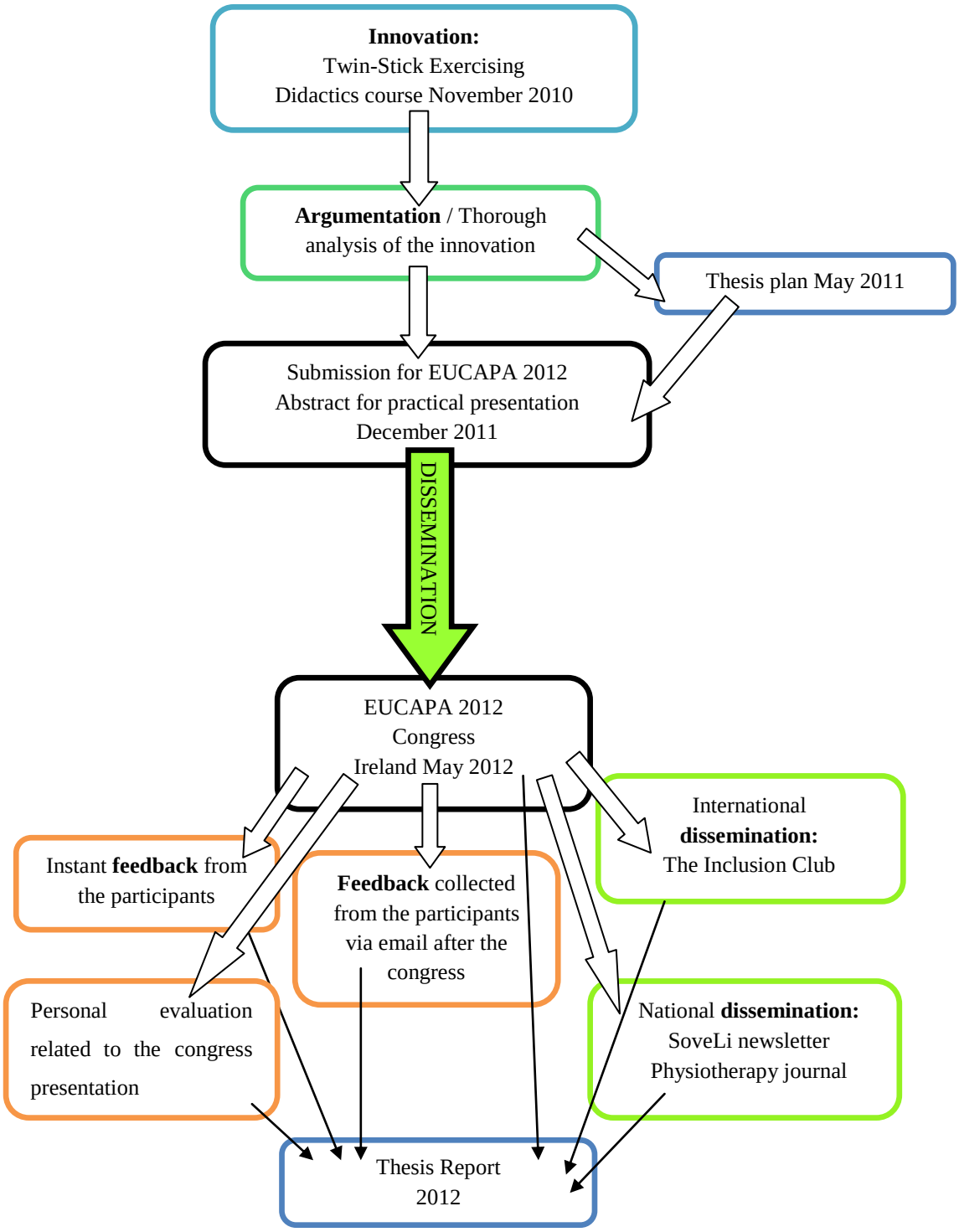


Figure 2. Progress of the thesis

The aim of this thesis is to argue and give reasons for the presented new innovation called Twin-Stick Exercising. Stick exercising is a traditional way to exercise in Finland, which has its roots already in 19th century (Arvonen 2006, 3; Suomela

1933, 5-6). The more modern versions of stick exercising are nowadays carried out in various forms, and several instruction books and websources are available (Aalto & Kykyri 2009; Arvonen 2006; Kantaneva & Kasurinen 2001; Työterveyslaitos 2010; Edu.fi 2012).

Twin-Stick Exercising will offer a new innovation in the area of physical activity, in the field of APA, physiotherapy, and group exercising. Consequently, the exercises might be carried out in recreational settings with a large group of equal participants, as well as in more intimate rehabilitative settings between an instructor and a client. The basic idea of Twin-Stick exercising is to encourage the social interaction in exercising. It demonstrates a new way to utilize two sticks in exercising or even dancing with a partner: both having a grip in the stick, facing each other. In Twin-Stick exercising the level of facilitation provided by the more "skilful" partner enhances the other partner's performance. Especially this innovation presents a new way to enjoy the rhythm and movement together with your partner. Lastly, from the health promotion point of view Twin-Stick exercising encourages to physical activity, inclusion, and well-being.

The didactic and physiotherapeutic principles of Twin-Stick Exercising are described in this thesis. Furthermore, the connections of the innovation to dance are reflected. The dissemination and feedback related to the innovation are presented as well. Lastly, the modifications of the basic idea for people with special needs are discussed in order to result in developmental ideas and future plans.

This thesis is a part of the Research and Development activities of Satakunta University of Applied Sciences. The purpose of the Research and Development activities is to encourage activities where new information, research and/or experience is applied for the creation of new products, services, or for the improvement of existing ones (Website of the Satakunta University of Applied Sciences 2012). Twin-Stick Exercising aims at both international and national dissemination, in order to share the idea with other professionals in the fields of physical activity, APA, and physiotherapy.

3 BACKGROUND OF STICK EXERCISING

Kantaneva and Kasurinen (2001, 8) describe that stick exercising is a versatile training form which is suitable for both health enhancing physical activity and break exercising regardless of age or condition level. The basics are simple and easy to carry out, and the equipment itself is cheap and compact as well. Moreover, stick exercising programmes are adaptable for the basic mobility and strength exercises in more powerful training. The effectiveness of stick exercising is based on its comprehensiveness. With the assistance of the stick and own body weight strength, speed, endurance, mobility, muscle balance, balance, and posture can be exercised. Furthermore, stick exercising teaches core stability, correct lifting technique, and is excellent for back and shoulder care. The significance of the stick in spine rotation and bending exercises has been pointed out as it increases the lever arm. (Aalto & Kykyri 2009, 85-86; Arvonen 2006, 9; Kantaneva & Kasurinen 2001, 8-9; Rintala et al. 2012, 258.)

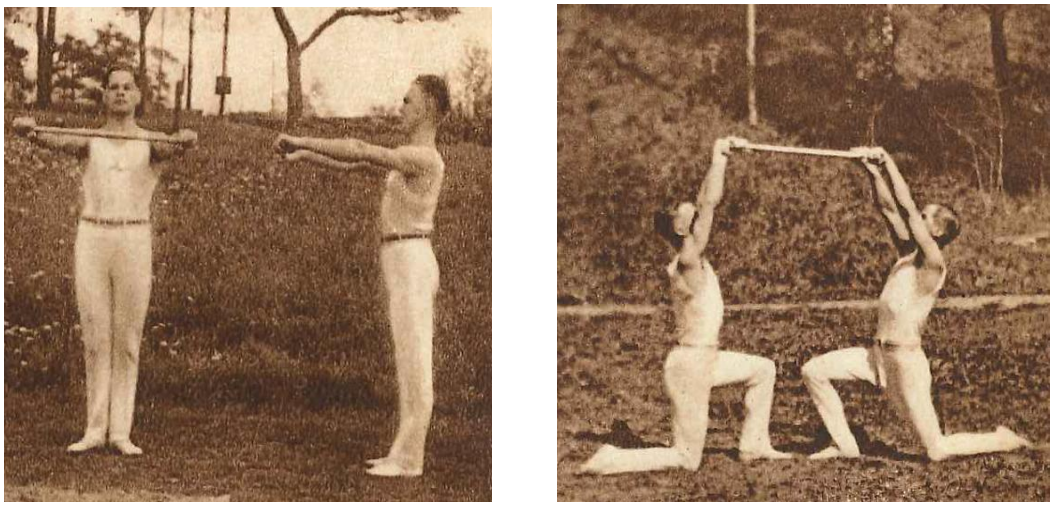
3.1 Historical overview

Working out individually with a stick – even in a group activity – has been a traditional way of exercising in Finland more than hundred years ago. For example, Kälviän Tarmo, Merikarvian Into, and Vaajakosken Kuohu had group exercising with sticks for males in the beginning of 20th century. Furthermore, in Vaasan Kiisto women participated in that type of gymnastics as well. (Website of Kälviän Tarmo n.d.; Website of Merikarvian Into n.d.; Website of Vaajakosken Kuohu n.d.; Website of Vaasan Kiisto n.d.)

Already in 1933 a book called Uusi sauvavoimistelu (the new stick exercising) was published. According to its author Klaus Suomela (1933, 7) the purpose of the book was to present the new stick exercising postures, movements and a complete exercising programme. The stick itself had taken a new form; the old iron stick had now become wooden. Until those days the exercising stick was made of iron, and it says having its origin in the middle of the 19th century in the warlike Europe. The iron stick imitated rifle both in weight and length, and was not only used for

gymnastics, but also for the military purposes. Consequently, the equipment was used in male gymnastics to prepare the youngsters to handle a rifle, and offer a kind of military pre-training. (Klaus Suomela 1933, 5-6.)

In the beginning of the 20th century the stick had become lighter as the gymnastics itself developed and became less loading. The new wooden stick was lighter, shorter and had lead weights on the edges. Moreover, Suomela (1933, 6-7) reports that the most important reason for the development of the equipment was that it responded to the requirements of the modern gymnastics and multiplied the existing movement bank. Additionally, the new stick could simply be made for instance at carpentry classes (Suomela 1933, 7). Both breathing and posture exercises are presented in the book. The exercises are carried out either individually or in pairs. In pair exercises the pairs are either facing each other or having their backs facing each other, and holding two sticks in both hands – as in Twin-Stick Exercising. The diversity and resource of the exercises are significant. Moreover, instructions are detailed and illustrated with photographs (Photographs 1 and 2). (Suomela 1933, 34-49.)



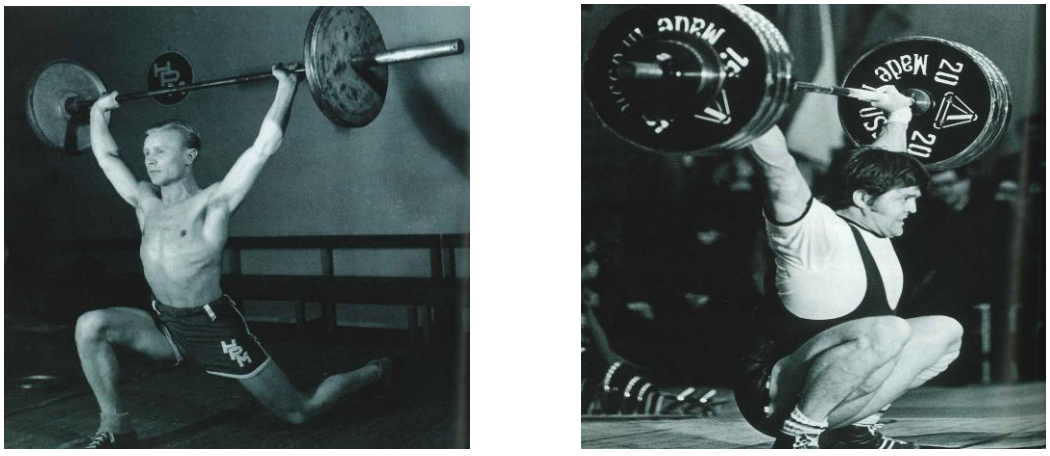
Photographs 1 and 2. Postures and posture exercise (Suomela 1933).

3.2 Origin in weightlifting

The roots of the more modern Finnish stick exercising are in weightlifting. Warming up and teaching the lifting movements first with only the broom shafts and own body weight was common at weightlifting practice. Especially, two basic movements: jerk

and snatch (Photographs 3 and 4), were the sources for the stick exercises. In the late 1980's Juhani Salakka, the executive director of Finnish Weightlifting association, modified the weightlifting warm-up to a many-sided training routine. Salakka established the fifteen basic movements of the stick exercising which involved the whole body. In addition, Salakka started to educate coaches and instructors by combining and adapting the movements for various needs. (Arvonen 2006, 3, 11; Kantaneva & Kasurinen 2001, 8.)

Jerk and snatch in addition inspired the development of the bar exercising (weightlifting bar exercising). By modifying the components of these movements more than one hundred bar exercising movements have been developed. In 1998 the Ministry of Education supported the project by the Finnish Weightlifting association to develop bar exercising suitable for different sports, fitness training and health enhancing physical activity. Similarly to stick exercising, the bar exercises emphasize the right lifting technique and core stability both in training and daily living. (Arvonen & Kailajärvi 2002, 10-11, 48.)

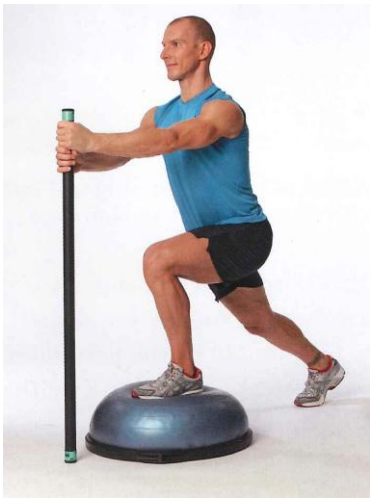


Photographs 3 and 4. Jerk and snatch (Arvonen & Kailajärvi 2002, 40, 108).

Exercising bar compared to the stick offers more resistance as it weights between two and ten kilograms or two and twenty kilograms (Arvonen & Kailajärvi 2002, 10-11; Rintala et al. 2012, 260). Consequently, the intensity and effectiveness of exercising can be varied by using different amount of weights, repetitions, and varying the tempo. The whole body is involved in the bar exercises and the primary aim is to improve both muscle strength and muscle endurance. (Arvonen &

Kailajärvi 2002, 10-11, 48.) Furthermore, Rintala et al. (2012, 260) report bar exercising being beneficial for balance, coordination, posture, and skeletal system. Therefore, it is understandable that Arvonen and Kailajärvi (2002, 10) state that stick and bar exercising should be established in the physical education in schools.

One international example of exercising with same type of equipment is the Body Bar, which has been produced in the United States since 1987. The idea of Body Bar was developed when parts of kayaking training were brought into a workout session. During the exercise the canoeists used steel bars, and similarly a Body Bar is made of steel, but covered with soft rubber. In addition the weight is evenly distributed and it does not require any installation. There are sixteen variations of Body Bar equipments, and they vary both in weight (1-16 kg) and length (60-182 cm). The Body Bar is described as neat, compact, and simple to use. The exercising itself aims at muscle strengthening, and through improvement of physical condition, improvement in life quality. (Cook & d'Almeida-Cook 2006, 7-11.) Interestingly, the basic movement bank in Body Bar is fairly similar to the Finnish stick exercising movements. The most significant difference is the weight of the equipment, and utilization of other equipment as step board, mat, and Bosu-ball in Body Bar exercises (Photographs 5 and 6). (Cook & d'Almeida-Cook 2006, 19-151.)



Photographs 5 and 6. Body Bar exercising with step board and Bosu-ball (Cook & d'Almeida-Cook 2006, 101, 65).

As the stick exercising was popular and widely used, the Finnish Ryhtiliike association was founded in 1994. Its purpose was to promote physical and mental

well-being of Finnish citizens. The original founder members were the Finnish Weightlifting association, Painonnoston Tuki ry, and Suomen Selkäliitto ry. Later on in 1998 Suomen Latu (the Finnish Central Association for Recreational Sports and Outdoor Activities) joined the Finnish Ryhtiliike association as well. The primary aim of the association was to develop the stick and bar exercising to adaptable and diverse exercising programme for various target groups in different ages. In addition, the Finnish Ryhtiliike ry has educated instructors since the year of foundation (Arvonen & Kailajärvi 2002, 10, 139; Kantaneva & Kasurinen 2001, 75; Rintala et al. 2012, 258).

3.3 Nordic Walking

Nordic walking is a popular sport in Finland. According to a survey by Suomen Latu 1, 5 million Finns carry out Nordic Walking (Webpage of UKK-Institute). Stick exercising is often used as a warm up for Nordic Walking. It can additionally be carried out during the breathing break, as a cool down, and assistance in stretching. In addition to the stick exercising movements, the Nordic Walking sticks are used as support for balance in e.g. lunges and push-ups. Additionally, when performing demanding movements such as jumps or leaps in rugged terrain and slopes the sticks provide extra support. (Aalto & Kykyri 2009, 18-27; Arvonen 2006, 76-79; Kantaneva & Kasurinen 1999, 14-20; Rintala et al. 2012, 263; Suomen Latu 1999.)

As in many sports also in Nordic Walking several variations have been developed. In the warm up with the walking sticks, the more playful versions increase social interaction between participants. For example, participants form a circle and change the sticks in various ways. (Kantaneva & Kasurinen 1999, 24-25.) In addition, the use of Nordic Walking sticks has been connected to roller skating in order to increase speed, to become more rhythmical, and to assist in braking (Aalto & Kykyri 2009, 126-129).

The walking sticks can be connected to each other with an extra bar, and is then called Tandem Nordic Walking (Photograph 7). It is likewise suitable for all, but requires at least two participants. Therefore, it is a convenient variation for a person

with visual impairment, for instance. The presence of the other person makes walking safe, thus decreased speed is not necessary. Moreover, Tandem Nordic Walking is beneficial exercising method for people with other orientation problems due to e.g. disability or memory disorder. Additionally, persons with neurological disorders may exercise balance and motor coordination through the tandem sticks. (Kuutamo & Hölsömäki 2005, 71-72; Rintala et al. 2012, 263.)

Photograph 7. Tandem Nordic Walking (photo: Liikuntatieteellinen Seura / Elli Knuutila).

3.4 Variations of stick exercising

Exercises carried out in pairs with sticks are included in the stick exercising movement bank as well. A couple of stick exercising books present pair exercises and stretches which are carried out with one stick per pair. The exercises are carried out in turns; the other person performs and the other either resists or assists the movement (Aalto & Kykyri 2009, 111-113; Kantaneva & Kasurinen 2001, 57-62). Also Arvonen (2006, 142-146) describes similar exercises, but adds elements of balance into the exercises e.g. partner and stick assist in scale (Photograph 8).

Additionally, in Arvonen's work two sticks are used in pair exercises. The partners are either facing each other or standing one after another, and holding the sticks in

both hands. Finding the resistance and rhythm of the movement together with the partner are essential. (Arvonen 2006, 142-146.) The exercises presented have some similar components as Twin-Stick Exercising, especially the interaction, positioning and use of two sticks. Lastly, Arvonen (2006, 147-148) shares few ideas of games carried out with sticks. These games involve a whole group of people and encourage exercising and the sense of togetherness (Photograph 9).

Photographs 8 and 9. Pair and group exercises by Sirpa Arvonen (Arvonen 2006, 143, 147).

In addition, various stick exercising examples with or without a pair exist widely. For instance, the Finnish Institution of Occupational Health has downloaded health enhancing video clips to website of YouTube - easily available for all. Stick exercise programme for pectoralis muscles and the core (Rinta rottingille kaverin kanssa, rintalihas ja keskivartalojumppa) carried out in pairs with sticks is available online. (Työterveyslaitos 2010.) As a difference to Twin-Stick Exercising this example programme as well as Arvonen's (2006, 142-146) pair exercises is stationary; they do not include steps which move in space as Twin-Stick Exercising does. However, they include social interaction, and are possible to carry out with or without music similarly to Twin-Stick Exercising.

The Finnish National Board of Education upholds a website named EDU.fi aimed for teachers. The pages provide information, material and approaches in different fields to support the educational work. Stick exercising has its own category under the physical education section including instructions of the basic stick exercising movements, and a couple of pair exercises as well. There are additionally suggestions for stick exercising programmes for children in different ages. Kebaccobic is one form of stick exercising recommended for the pupils between

fourth and ninth grades. The structure of the session follows an aerobic class including three parts: aerobic fitness, muscular endurance, and stretching. In addition, rhythmical music is used as an inspiring factor. (Website of EDU.fi 2012.) Similar version to Kebaccobic called Keppiaerobic (Stick Aerobics) is described in the book of Kantaneva and Kasurinen (2001, 64-65). However, more detailed descriptions about these sports were not found in literature.

Several variations of the traditional stick exercising have been developed in addition to the already mentioned ones. The stick exercises have been designed for different positions as well; standing, sitting, and on the floor. Additionally, stick exercising has been taken outdoors and into the pool from the gyms. Also tailor-made stick exercising programmes that are beneficial for certain sports e.g. ice games and golf or break exercising for motorists and office workers have been designed. Plenty of other examples of exercising with the stick are available in several sources for the hobbyists. Even an exercise programme performed with a pen has been created. (Arvonen 2006, 66, 79-81, 83, 107-111; Kantaneva & Kasurinen 2001, 7, 68-73.) As Kantaneva and Kasurinen state (1999, 3) only sky is the limit for different stick exercise applications. In this thesis one more is presented: Twin-Stick Exercising.

4 ARGUMENTATION FOR TWIN-STICK EXERCISING

This chapter focuses on the argumentation for Twin-Stick Exercising. To support the understanding of the argumentation the reader is recommended to familiarise oneself with the practical presentation online. The material is available in the following link (Javanainen-Levonen & Mäkelä 2012).

http://www.youtube.com/watch?v=XlYl9AIN074&feature=player_embedded

4.1 Didactic reasoning

Mosston & Ashworth (2008, xviii-xix) describe The Spectrum of Teaching Styles which includes eleven styles of teaching named from A to K. The Spectrum theory forms the basis of teaching on decision making (Mosston & Ashworth 2008, 8). The didactic principles of Twin-Stick Exercising mainly adhere to the Reciprocal style (C). The characteristics defining the Reciprocal style are social interaction, reciprocation, receiving and giving immediate feedback, which is guided by specific criteria prepared by the teacher. The learner's role is to work in partnership relationships. In this model the other one is a doer who carries out the task, while the other learner is the observer. The task of the observer is to offer immediate and on-going feedback for the doer based on the criteria designed by the teacher. After finishing the first practice the learners switch roles in order to fulfill the criteria of Reciprocal style. The role of the teacher in this teaching style is to make all subject matter, criteria, and decisions about the logistical issues and to provide feedback to the observer. (Mosston & Ashworth 2008, 116.)

The aspects of social interaction, reciprocation, receiving and giving immediate feedback are present in Twin-Stick Exercising, as the activity is carried out in pairs. Twin-Stick Exercising can be performed either in a group with equal participants or in more intimate rehabilitative settings with an instructor and a client. Therefore the roles of the learners are not totally identical to the description by Mosston & Ashworth (2008, 116). When Twin-Stick Exercising is carried out by two equal participants, they basically manage the both tasks at the same time: perform and observe (Photograph 10).

Photograph 10. Interaction between the partners during the ongoing exercise.

In modified setting as in therapeutic situations the roles of the Twin-Stick Exercising participants are different to each other. In both cases, it is essential to estimate the partner's upper limb range of movement (ROM). Firstly it is an item of safety, and secondly an example of immediate feedback. Nevertheless, the role of the teacher or instructor is mainly the same as in the description of the Reciprocal style. When Twin-Stick Exercising is carried out in group activity the teacher is demonstrating the movements (with a chosen partner), but stands outside of the exercising itself. The pairs are exercising, while the teacher's responsibility is to observe and instruct the group from the outside. Furthermore, Rintala et al. (2012, 284) state that demonstration carried out by the instructor or other participant offers a visual image of the movement, which supports the learning process.

In Twin-Stick Exercising the selection of the partner can be carried out in many ways. If the partners are equal (as e.g. in group activity) the selection can be based on the pairing techniques presented by Mosston and Ashworth (2008, 129-130). The participants can be lined up and count off by twos, the teacher can select the partners, participants can select each other, or pair up with the person next to each other. Moreover, the most convenient ways related to Twin-Stick Exercising are pairing up by height or skill level. (Mosston & Ashworth 2008, 129-130.) In the rehabilitative settings the selection is based on other choices, then e.g. therapist and client form the pair or person with visual impairment and a sighted person work in pairs. Consequently, the selection is based on the skill level. Thus the level of facilitation is provided by the more competent partner and enhances the other partner's

performance. In this case competence is related to coordination, sense of rhythm, level of experience inter alia.

The objectives in the Reciprocal Style give priority to two dimensions. Firstly the social relationships between peers and secondly the conditions for immediate feedback are emphasized. Primary objective of this teaching-learning behavior is to develop tolerance, patience, empathy etc. during interaction with different people. Moreover, to trust interacting with others and experience the rewarding feelings of seeing one's pair succeed are behavior objectives in the Reciprocal style. (Mosston & Ashworth 2008, 116-117.) The didactic principles of Twin-Stick Exercising aim to follow the behavior objectives of the Reciprocal style explained above.

According to the anatomy of the Reciprocal Style, timing of the feedback is essential. The sooner feedback of the performance is received the greater chances are for correct performing. (Mosston & Ashworth 2008, 117.) In Twin-Stick Exercising the pair work enables the immediate feedback both through the stick and partner during ongoing activity. In Reciprocal style the teacher's role is additionally to watch the doer and observer, but communicate only with the observer (Mosston & Ashworth 2008, 117). In that case Twin-Stick Exercising does not match to the Reciprocal Style, because the partners perform the same task simultaneously. Even though the skill level of the partners may differ, it does not affect. The teacher's foremost task is to set the scene for the new roles, and explain the purpose of reciprocal relationship in the beginning of the instruction. Thus, the teacher shifts the feedback management to the learner. (Mosston & Ashworth 2008, 119.) In Twin-Stick Exercising these features are required from the teacher of the session.

Moreover, Mosston and Ashworth (2008, 11-12) state that the decisions made for each teaching session should support the development of the learner in various ways. The aim is that each experience emphasizes development of the human attributes through the Developmental Channels which are cognitive, social, physical, emotional, and ethical. Hence, each teaching event provides opportunities for learners to participate in, and develop, specific human attributes by one or more of the Developmental Channels. (Mosston & Ashworth 2008, 11-12.) Reflections on

Twin-Stick Exercising in the light of Developmental Channels are presented in Figure 3.

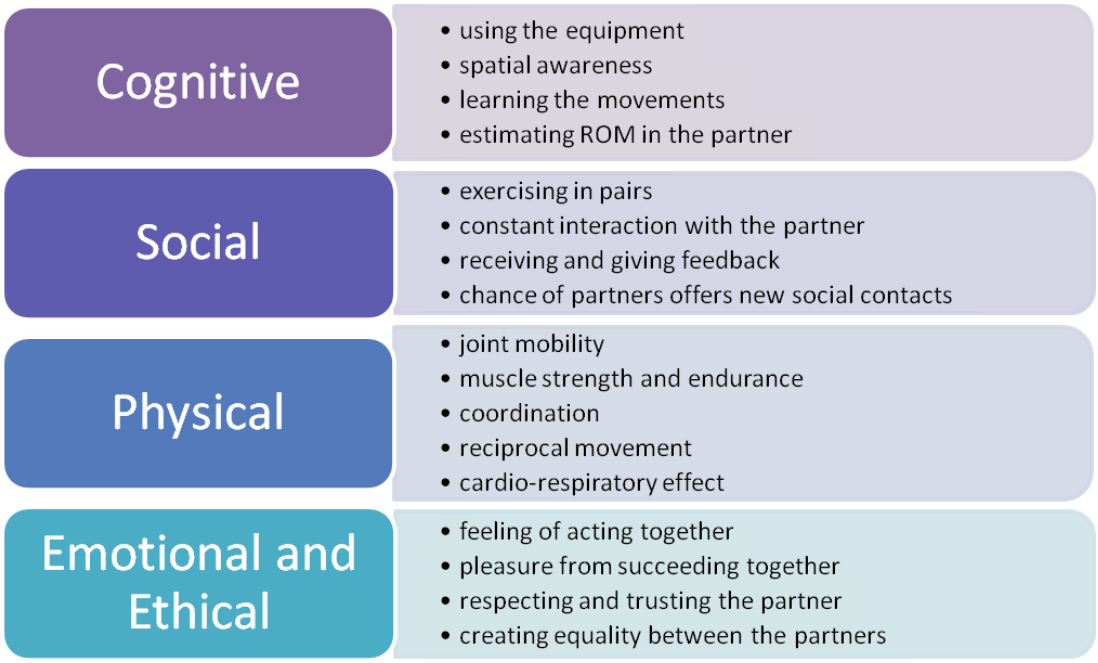


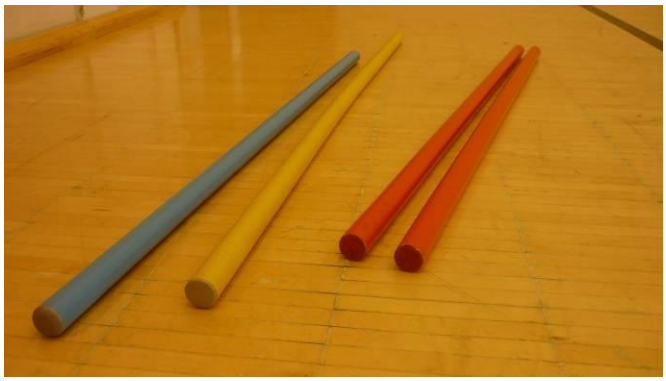
Figure 3. Reflections on Twin-Stick Exercising in the light of Developmental Channels (Mosston & Ashworth 2008, 11-12.)

4.2 Equipment

Rintala et al. (2012, 258) describe that the "official" exercise stick is 130 centimeters long and 28 millimeters thick wooden stick including markings for jerk and snatch grips. This type of stick among several other options is suitable for Twin-Stick Exercising. Moreover, the sticks used in Twin-Stick Exercising can be made of wood, plastic or even fiberglass. The ideal length of the stick is between 100 and 150 centimeters and depending on the material they should not weight more than one kilo. The weight limitation is an item of safety in case the participants drop the stick during exercising. In addition, the sticks should be round shaped thus convenient to grip. Consequently, the diameter approximate from two to four centimeter is adequate.

Most gyms have plastic gymnastic sticks which are excellent for Twin-Stick Exercising. The plastic sticks are light in weight and often available in variety of

colors (Photograph 11). The use of two different colors per pair offers variation to didactic and guiding issues. For example, in verbal guidance the name of the color can be used instead of left and right. In addition, the same basic idea of not having two identical sticks can be modified for different didactical purposes.



Photograph 11. Colored exercising sticks.

However, the highest priority is that the equipment is low-priced, easily available, and ecological. Therefore, the wooden sticks are preferred. For example broom shafts are suitable and easily available for everyone (Photograph 12). Depending on the modification of the basic idea the sticks available can be used for this exercise purpose e.g. ice hockey stick or Nordic Walking stick.

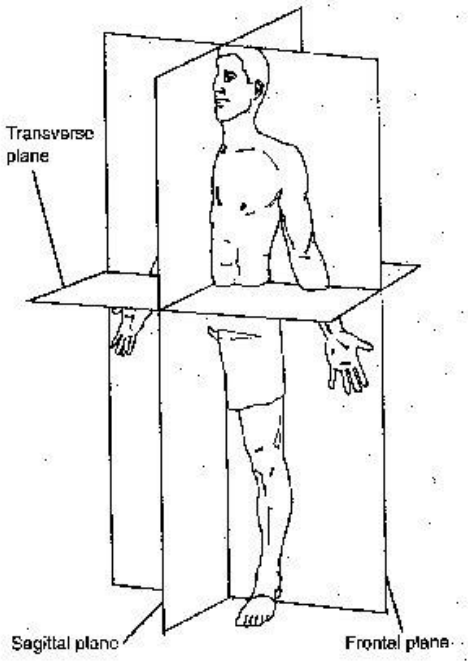
Photograph 12. Broom shafts can be used as exercising equipment in Twin-Stick Exercising.

4.3 Physiotherapeutic reasoning

4.3.1 Movement planes

The joints of the human body may move in to several directions. Therefore, a system of description has been innovated to simplify the visual analysis of the movement. According to that description movements occur in three planes and three axes from the anatomical position (Picture 1). The sagital (median) plane divides the body into vertical right and left halves, whereas frontal plane makes the division into vertical front and back halves. Moreover, a transverse (horizontal) plane splits the body in upper and lower parts, which are in ninety degrees angle to the vertical axes. Movements which occur on the sagital plane are flexion and extension, and movements on the frontal plane are abduction, adduction and lateral flexion. For example, in walking the lower limb joint movements (flexion and extension) occur in sagital plane. Finally, the rotary movements, horizontal abduction and adduction occur on the transverse plan. (Calais-Germain 1991, 2-5; Sandström & Ahonen 2011, 163; Tortora & Derricson 2009, 16, 270-274; Trew & Everett 2005, 90-91, 175.)

However, the system is not absolute as the shape of most joints allows movement in more than one direction. In addition, most movements do not begin from the anatomical position, but are naturally functional. (Trew & Everett 2005, 91.) Nevertheless, the movement planes describe the directions of the movements that the human body performs by nature. The natural physiological movement occurs generally on the three planes simultaneously (Sandström & Ahonen 2011, 163.) Therefore, the movements in Twin-Stick Exercising are planned to follow that pattern in order to be physically beneficial and functional.



Picture 1. Movement planes (Education n.d.).

4.3.2 Joint mobility and range of movement

Furthermore, Twin-Stick Exercising aims at restoring or increasing the range of movement (ROM) in the joints. In physiotherapy settings there are many methods to increase the ROM, and the most logical is to use the movement itself. Movements are either active or passive. Active assisted exercise is used when the full ROM of the joint is not reached, then an external force contributes assistance to the movement. Manual assistance is one way of active assistance, in which the therapist assists the muscular effort of the performer. (Trew & Everett 2005, 98, 106). In Twin-Stick Exercising movement is carried out actively, but features of active assisted exercise and manual assisted exercise can be applied as well. In this case the movement facilitation provided by the partner/therapist and stick act as assistance to the movement instead of the direct contact of the therapist. Naturally, safety items must be ensured if movement limitations are facilitated with equipment without a direct human sensation. Therefore, this variation is only an option for target groups that may benefit from different type of manual guidance or assistance in movement.

Mobility of the trunk is essential for people suffering from respiratory diseases as the structure of the ribcage may change in long lasting conditions. The posture and

mobility of the ribcage should be exercised and stretched, and the respiratory muscles activated. The exercises aim at increasing or maintaining the mobility of intercostal joints in the spine and sternum, what is required in breathing. (Rintala, et al. 2012, 170-173.) Hence, the movements of upper limbs and trunk performed in Twin-Stick Exercising support the mobility training of the ribcage. Increasing ROM and maintaining functional movement patterns are not the only benefits of regularly performed active movement. Additionally, Trew and Everett (2005, 98, 107) report prevention of contractures, increase of venous circulation, pain reduction, increase in joint nutrition, and strengthening of the muscles. Thus, by carrying out Twin-Stick Exercising all the benefits of motion are obtainable.

4.3.3 Reciprocal movement

Finally, from the physiotherapeutic point of view, one of the main aims of Twin-Stick Exercising is to facilitate reciprocal movement. Rhythmical and reciprocal movements of both lower and upper limbs are involved in walking. This means that the lower limb move reciprocally with one foot always in contact with the ground, and the opposite arm to front foot swings forward. Reciprocal movement pattern of upper limb should occur unrestrictedly in phase with the lower limb. The upper limb swing is provided by the rotatory movements of the spine and thorax, and its primary movement occurs in the shoulder joint and minor movement in elbow joint. In walking all the lower limb joints are involved in extension and flexion that occurs on sagital plane. Moreover, the arm movement in gait should direct forwards and towards the body's midline, and assist in maintaining the balance. (Sandström & Ahonen 2011, 298, 322; Trew & Everett 2005, 174-175, 183.)

The reciprocal movement can be practiced and facilitated by Twin-Stick Exercising as it includes rhythmical step sequences involving movement in joints of the vertebral column, trunk rotation, and thereby arm swings (Photograph 13). By combining steps and walk, other aspects as rhythm and step length can be exercised as well. In rehabilitative settings the assisting person provides the impulse through the stick and facilitates the movement.

Photograph 13. Reciprocal movement exercised in Twin-Stick Exercising.

4.4 Connection to dance

The author of the thesis desires to clarify, that dance from the performing art point of view is not meant to be combined or confused in Twin-Stick Exercising. Consequently, aspects of interpretation, improvisation, and aesthetic characters of dance cannot be included in the Twin-Stick Exercising like they occur in dance as an art form. Fitt (1988, 10) encapsulates the author's thought: "The essential fire of dance is unquantifiable. Evaluation of dance is done with heart and soul, not the tape measure and the stopwatch."

There are still several qualities of dance which Twin-Stick Exercising includes. Primarily, the feeling of joy received through the dance is aspired. Dance has its roots in people's will to express their feelings, and interpret emotions (Karina & Crawford 1990, 6). Even though dancing involves the most of the human being's whole physical capacity, it is not considered only as a beneficial training, but also as something amusing. While dancing, the mind is resting in the movements and it is possible to forget the worries and even pain for a moment. Dancing stimulates people's physical abilities naturally, but at least as important is the social interaction around it; people sozialize and have fun. For example, folk dance, senior dance and ballroom dance accosiations are excellent forums for that. Dance is regarded as a many-sided training activity, which can be continued throughout life. (Ryberg 2001, 115.) Furthermore, music inspires people to move and dance, and is therefore an essential part and motivating factor in Twin-Stick Exercising as well.

4.4.1 Reflections to established dance forms

Although, the Twin-Stick Exercising is a new innovation, it is interesting to reflect it in the light of old-established dance form such as classical ballet. In ballet, there are five basic positions both for feet and arms, and it is build on seven movements; to bend, to stretch, to raise, to glide, to jump, to dart, and to turn. These movements of dance build up the ballet exercises and their combinations create the ballet vocabulary. (Hammond 2006, 35-38; Kassing & Jay 1998, 40.) The movement planes explained in the previous paragraph are part of the movement description and kinesiology in dance as well (Calais-Germain 1991, 1-5; Fitt 1988, 21-22).

In case of Twin-Stick Exercising, the examination of the human movement planes and directions resulted in the choice of the simplest movements to be the basis for the programme. During the planning and implementation phase a few basic concepts were set, and thereafter the type of movement and use of space were designed. As a conclusion, the author had the basis and number of ideas for variations e.g. level of difficulty and dance style. Consequently, a common feature for both dance and exercising methods is probably that the vocabulary builds up on the set basis.

The imagery of dance does not always follow the anatomical awareness, but the decisions in ballet are mainly based on aesthetic demands (Karina & Crawford 1990, 92). In this case Twin-Stick Exercising is the opposite, as mentioned before; Twin-Stick Exercising is not related to dance as performing art, but exercise form that supports the basic human movement with influences of dance. Finally, the use of the opposite limbs in the ballet movements was established in the 18th century (Hammond 2006, 188). One of the key principles of the Twin-Stick Exercising is particulartly the reciprocal movement, and the history from ballet supports its functionality.

Another established dance forms that Twin-Stick Exercising can be compared with, are the partner dances. Both in partner dances and Twin-Stick Exercising the couple is facing each other. In Twin-Stick Exercising the element of human touch and intimacy is not present, but it encourages to another kind of interaction between the couple. A partner dance couple is formed by a man and a woman, whereas in Twin-

Stick Exercising gender has no significance. In Twin-Stick Exercising the idea of guidance from the stick can be compared to dancing with a partner where the man is leading in order to facilitate woman's movement.

In addition, a couple of rules decided for Twin-Stick Exercising are similar to principles of partner dances. Especially, there are similarities with e.g. waltz and quick step, which belong to the ballroom dance. The common principle is that partners' steps are mirroring each other. The other dancer moves with the right foot front and the other one with the left foot back. In partner dances position and hold is determined by each dance style, while in Twin-Stick Exercising the partners hold the sticks. (Bottomer 2006, 40, 173,175, 199; Laird 1996, 6-7, 16-17, 24-25.)

The way of orientation in space in partner dance is determined by the positions of man and woman. The man is in a position to move forward with the floor traffic flow, and the woman moves backwards (Bottomer 2006, 172). In Twin-Stick Exercising the forward-backward movements on sagital plane follow a similar kind of rule. In this case the other person moves forward with right or left foot and the other backwards with the opposite foot. Hence, the reciprocal movement is fulfilled. Moreover, it is a simplifying rule that facilitates the performance.

4.4.2 Rhythm and elements of dance

First and foremost dance is considered as a wholeness that consists of time, space, and power. All these elements are dependent on each other. Moreover, the flow, which means continuity of movements in time and space, is aspired in dance. (Karina & Crawford 1990, 15; Rintala et al 2012, 283.) Combining of all the elements in the performance, coordination skill and rhythm management on a certain level is required.

As mentioned this final thesis excludes creative dance and dance as a performing art form, in which the use of music is optional. Otherwise, dancing means moving the body in the rhythm of music. Similarly does Twin-Stick Exercising when it is combined with music, and sequence of movements or even choreography is planned.

Consequently, this practice involves and requires counting rhythm. In dance language it indicates the time reserved for each step or movement (Laird 1996,75). Hence, both recognising and knowing the time are included in the rhythm management (Rintala et al. 2012, 282). In case where the rhythm is problematic, it could be exercised with a more skilful partner by carrying out Twin-Stick Exercising.

The basic programme of Twin-Stick Exercising follows the 4/4 time. Therefore the movements are repeated occuring in pairs; four, eight, sixteen etc. repetitions of the same kind of movement are carried out. This is the most typical way to use rhythm in basic exercising, but nothing excludes the other options. Nevertheless, influences of dance and music make Twin-Stick Exercising more than merely movements for anatomical requirement. Use of music, rhythm, moving in space, interaction, and expression of joy are features that mark out the Twin-Stick Exercising from other stick exercising programmes.

4.4.3 Dance therapy

Lastly, some thoughts on the matter of dance therapy and Twin-Stick Exercising are presented. A common factor for both is the suitability for people in different ages and implementation either in private therapy setting or in a group. People in need for special attention in their behavior, learning, orientation, or physical problems benefit from dance therapy. Moreover, dance therapy is effective for persons suffering from unbalanced emotional life, neurological disorders or socially unsatisfied situations. Dance therapy is practiced widely, for instance in rehabilitation, mental health, medical, educational and forensic settings, and in nursing homes, day care centers, disease prevention, health promotion programs, and in private practice. (Hammond 2006, 171-173; Webpage of American Dance Therapy Association 2009.)

According to the Finnish Dance Therapy Association dance and movement therapy is a multidiscipline field, in which dance as a creative expression and art form intergrades with psychology science. The aim of dance therapy is to promote well-being by improving the body awareness comprehensively. Methods of dance therapy support the development of interpersonal relationships, and through them offer tools

for self-analyses. Some of the approaches are body awareness exercises, movement improvisation, and different forms of dance, plays and games. (Website of Finnish Dance Therapy Association 2003.) Therefore, to apply Twin-Stick Exercising to dance therapy sounds possible in theory.

Furthermore, Rintala et al. (2012, 282) describes the difference between dance therapy and adapted dance. Dance therapy is a treatment method provided by dance therapist whereas adapted dance refers to adapted physical activity education, and its music and dance activities. Twin-Stick exercising and adapted dance will be considered in the Discussion part of this thesis report.

5 DISSEMINATION OF TWIN-STICK EXERCISING

5.1 EUCAPA - European Congress of Adapted Physical Activity

The first European Congress of Adapted Physical Activity (EUCAPA) was organized in 1986 in Brussels, Belgium, and thereafter every second or third year in various European cities. The 11th congress took place from May 6th to 8th 2012 in Killarney, Ireland. The congress focused mainly on presentation of research which facilitates the inclusion and empowerment of people with disabilities. In addition, the congress included presentations relating to projects and programmes which promote service delivery in adapted physical activity. (Website of EUCAPA 2012.) Consequently, the congress guests are primarily working in the field of physical education, adapted physical activity, sport science or physiotherapy.

An innovative abstract of Twin-Stick Exercising was submitted by the author of the thesis (first author) and senior lecturer Tarja Javanainen-Levonen, PhD in sport sciences, (second author) for the congress. The title of the abstract was “Twin-Stick exercising - an innovative way to enjoy the rhythm and facilitate movement in your partner”. After the call for abstracts closed the EUCAPA scientific committee suggested number of changes to the abstract before the acceptance. The authors submitted an improved abstract, and finally it was accepted as a practical

presentation (APPENDIX 1). Thus, Twin-Stick Exercising was presented in public for the first time at EUCAPA 2012 on May 8th (Photograph 14). Additionally, the authors prepared another abstract according to the submission guidelines for the Book of Abstracts. This abstract was published in the Book of Abstracts handed out to the congress participants in electronic form (APPENDIX 2).

Photograph 14. Tarja Javanainen-Levonen and Niina Mäkelä before the practical presentation in EUCAPA 2012 congress (photo taken by Johanna Lehto).

During the congress days the registered guests had an opportunity to sign up for the sessions they were interested in. Nineteen persons had signed up for the Twin-Stick Exercising, and additional observers were allowed to enter the session. Finally, eight pairs participated in exercising and approximately twenty people were observing.

5.2 The Inclusion Club spreads the innovation worldwide

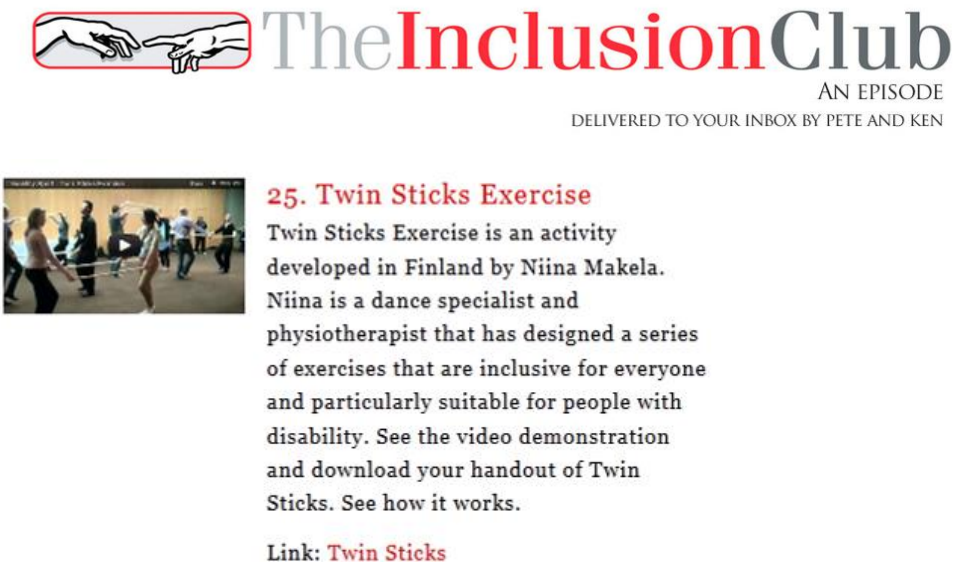
The Inclusion Club is a new and growing international community of people whose goal is to see more people with disability participating in sport activities. It was launched at ISAPA (the International Symposium on Adapted Physical Activity) in Paris in 2011, and has currently 650 subscribers from over 40 countries worldwide and (Black 2012).

The Inclusion Club is a not-for-profit public company founded by Peter Downs and Ken Black. The Founding Directors have remarkable career in the area of physical

activity, sport, physical education, recreation and disability. The basic idea of The Inclusion Club website is to facilitate people in providing opportunities for people with disability to participate in physical activity and sport. (Website of The Inclusion Club 2012.) The founders wanted to provide a platform for sharing ideas and opinions around inclusive physical activity and sport aimed at practitioners in the field of adapted physical activity. "We felt that there were plenty of websites and forums for academic exchange and research, but very little targeting the needs of people working at point of contact or developing practical programmes with disabled people." (Black 2012.)

Moreover, an opportunity to learn from other people working in the field of disability sports worldwide is offered by the website. For example videos, interviews, episodes, and case studies about inclusion from different point of views are available on the website. (Website of The Inclusion Club 2012.)

In the EUCAPA 2012 congress Ken Black from the Inclusion Club videoed the Twin-Stick Exercising practical presentation and interviewed the author of the thesis. The practical session and the interview were downloaded on the website of the Inclusion Club as an Episode (Picture 2). Episodes are defined as content pages that are developed especially for The Inclusion Club. The Episode of Twin-Stick Exercise consists of a brief introduction story, description hand out, interview, and video of the exercising. (Website of The Inclusion Club 2012.)

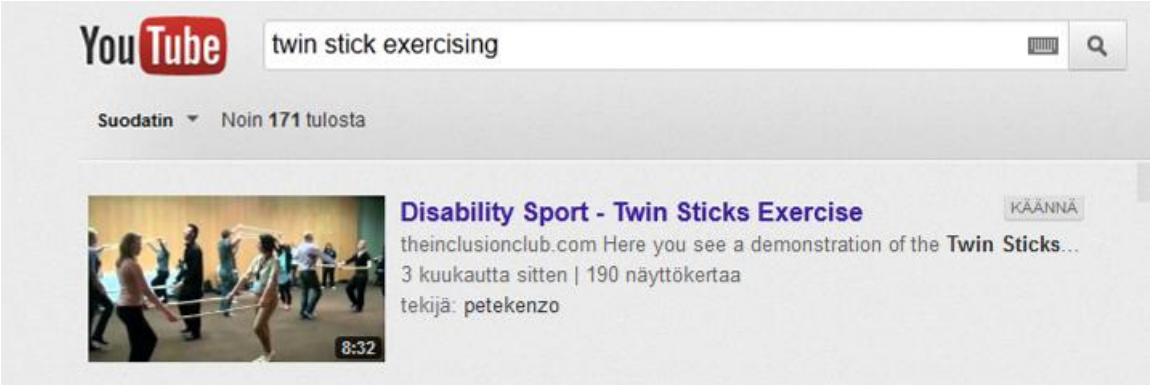


Picture 2. The episode of Twin-Stick Exercising (Website of The Inclusion Club 2012).

The whole episode can be found on the website of The Inclusion Club using the link below.

http://theinclusionclub.com/episodes/twin_sticks/

The next stage for the dissemination was the YouTube Channel of The Inclusion Club. Both the practical presentation from EUCAPA 2012 congress and the interview of the author are available in YouTube since July 2012. The practical presentation can be found under the Channel of The Inclusion Club, through the name search both in YouTube and Google search engines. The Twin-Stick Exercising clip in YouTube is classified as sport, and as identifiers disability sport, disabled sport, twin sticks, inclusive sport, adapted activities, and adapted sport are listed (Picture 3). (Website of Google 2012; Website of YouTube 2012.)



Picture 3. Video clip of Twin-Stick Exercising on the website of YouTube (Website of YouTube 2012).

> *Twin Sticks activity is the work of Niina Mäkelä from Satakunta University of Applied Sciences in Finland. Here, Niina explains a little about her back ground and introduces Twin Sticks.*
>
> *Here you see a demonstration of the Twin Sticks Exercise developed in Finland. Demonstration of participants at the 2012 EUCAPA Conference in Ireland.*

The dissemination of Twin-Stick Exercising has started through The Inclusion Club and its YouTube Channel. The idea of exercising is now available worldwide through the internet. Consequently, it is free of charge which enables the accessibility. Dissemination online is an up-to-date way of sharing and receiving information, and therefore, reaching the target groups of Twin-Stick Exercising is effective.

5.3 National attention

The Twin-Stick Exercising practical presentation at EUCAPA 2012 was noticed in the newsletter published by Soveltava Liikunta SoveLi ry (The Finnish Federation of Adapted Physical Activity). The author of the thesis was contacted by the designer of SoveLi and asked for a Finnish translation of the title. Twin-Stick Exercising was translated to "TuplaKeppi-harjoittelu" which was used in the newsletter story. The name of the publication is SoveLi-info and it is published on the website of SoveLi ry (Picture 4) (Website of Soveltava Liikunta SoveLi ry 2012).

> *Twin-Stick Exercising is a new way to use two sticks in pair exercising and even in dancing. Twin-Stick Exercising increases and enables the possibilities of being physically active with people in need of special support. Exercising*

is Zumba-like joyfulness, brisk, and promotes social behavior. The idea is excellent and economical to carry out. It is easy to differentiate and adapt according to the functional ability. The performance is not in focus, but exercising together. In addition, to blunder is allowed.

Picture 4. Practical Presentation of Twin-Stick Exercising was noticed in the newsletter of The Finnish Federation of Adapted Physical Activity (SoveLi-info 3/2012).

Furthermore, practical presentation of Twin-Stick Exercising at EUCAPA 2012 was noticed in Fysioterapia-lehti (the journal of the Finnish Association of Physiotherapists). The article focused on the participation of physiotherapy students in international congresses on APA. Moreover, it explains the role of active physiotherapy education in sharing the new ideas worldwide. In this context the process of Twin-Stick Exercising - from innovation to dissemination - was included in the article. (Javanainen-Levonen 2012, 27-28.)

Originally, student Niina Mäkelä developed the idea of Twin-Stick Exercising for the study module in didactics. The innovation broke into this year in May, in Killarney. An ambassador of the international network, Ken Black from The Inclusion Club, was present in the practical presentation. He videoed the session and interviewed the student afterwards. Finally, the network wanted to present the idea on their international website.

6 FEEDBACK

In this thesis the feedback was collected in order to evaluate the basic idea of Twin-Stick Exercising from the participants' point of view. As Tuomi and Sarajärvi (2009, 72) state, when it is desired to know what a person thinks, it is rational to ask him/her that. There were two ways of gathering feedback, and both of them were based on the practical presentation at EUCAPA 2012 congress. Firstly, the immediate verbal feedback was collected in the end of the practical presentation, and secondly a free formed feedback questionnaire via email was used. The target group was purposely chosen, as the intent was to gather feedback from people who have experience of the particular study subject (Hirsjärvi, Remes & Sajavaara 2009, 165).

The sample of this feedback survey is very small. Therefore, the generalisation of the results is limited. Neither is statistical methods meant for small survey data. (Website of Satakunta University of Applied Sciences 2010.) Nevertheless, the results of the feedback survey are presented in this thesis, employing both qualitative and quantitative methods. Despite the small sample, the feedback received has a significant value for evaluation of the Twin-Stick Exercising innovation.

6.1 Immediate response from the congress participants

Directly after the practical presentation the authors of the abstract asked the participants to give spontaneous comments about the basic idea of the Twin-Stick Exercising, and the possible ideas of its adaptations. In addition to the nineteen enrolled participants, approximately twenty persons were observing the Twin-Stick Exercising session. While collecting the instant feedback only the statements could be registered, but the amount of other participants' agreements or disagreements remain unknown. Nevertheless, the following points about Twin-Stick Exercising were raised up:

- It is similar to warm up in Nordic Walking
- It could be adapted to persons with visual impairment
- It could be adapted to elderly people

- It could be used with people who do not want to be touched e.g. persons with autism
- It is fun and good (effective) exercising
- It is beneficial for aerobic fitness
- We have those sticks at work, but have not known how to use/what to do with them

6.2 Personal evaluation of the practical presentation

There was mutual understanding between the authors of the abstract how the parts of the presentation will be divided and implemented. Moreover, there were spontaneous interaction and decisions made during the presentation in order to improve the quality of ongoing session, and respect the 30 minutes time limitation. It was challenging to manage the time limit, but with proper preparation and ability to make changes the authors succeeded. Furthermore, there was space for questions and free-form feedback discussion with the participants in the end of the session as planned.

Reciprocal style (Mosston & Ashworth 2008, 116-137) was used as teaching method, which was a functional choice. The selection of the movements and the level of the choreography were suitable for this particular session. Even though the participants could have managed with more challenging material, the shortage of time did not support that. Moreover the authors brought a package of glasses for simulating a variety of visual impairments to be tried out in the workshop, but unfortunately the presentation time was not long enough for this intervention.

6.3 Email feedback from the congress participants

Private documents - such as emails - are one form of data collection, and they can be analysed on some conditions by content analysis. Furthermore, content analysis is based on interpretation and deduction, which leads towards more conceptual vision of the studied phenomenon. (Tuomi & Sarajärvi 2009, 84, 112.) Thus, analysing the content of the Twin-Stick Exercising feedback illustrates and reflects the basic idea from the participant’s point of view.

A small-scale feedback survey by email was carried out after the congress. The intensive congress schedule did not allow gathering the contact information, and therefore they were traced afterwards. All in all, contact information of seventeen participants was traced from the registration list and photographs of EUCAPA 2012 congress. They were contacted by email and asked to reply to the free formed feedback questionnaire (N=17). Finally, ten out of seventeen replied to the feedback questions (n=10). Figure 4 presents the progress of the feedback survey.

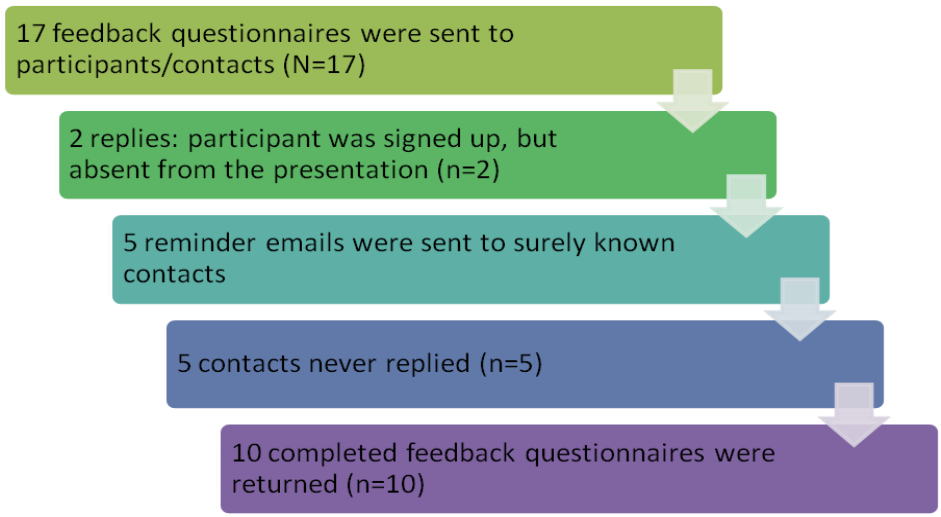


Figure 4. Phases of the feedback survey.

The feedback questionnaire was sent to the traced contacts in three weeks time after the practical presentation. The purpose was to let the participants to digest the experience for a period of time, and thereafter answer the email without an intervention by an interviewer.

Furthermore, the intention was to form the questions easily answerable and open. According to Silverman (2001, 13) neither reliability nor authenticity is often the core of the qualitative research. Usually, the aim is to accumulate a real understanding of people's experiences. Therefore, the open-ended questions are believed to be the most effective for this purpose. (Silverman 2001, 13.) In addition, Hirsjärvi et al. (2009, 201) report that open questions allow the respondents to state what do they really think, whereas multiple choice questions bind the respondent in readymade choices. Furthermore, in order to make replying simpler for the

respondents, questions were prepared both in English and Finnish. Consequently, the Finnish participants were able to use their native language in the reply. The email included the following three questions about Twin-Stick Exercising:

1) Please, describe briefly your experience of the Twin-Stick Exercising practical training session.
2) Do you think that the basic idea of Twin-Stick Exercising and its adaptations are useful in working life connections? Why/Why not?
3) What is your profession/current occupation?

In the qualitative management of the data, the material is first broken into pieces, conceptualized, and lastly aggregated in a new way as a logical ensemble. (Tuomi & Sarajärvi 2009, 108.) In the analysing phase the features that came up in several interviewees' answers were explored, and thus the employed method was thematizing (Hirsjärvi & Hurme 2009, 173). The results are presented by using anonymous authentic quotations and graphic representations. Hirsjärvi and Hurme (2009, 32) report, that it is possible to use quantitative methods to describe the results of qualitatively collected data. Figure 5 presents the results in the form of descriptive expressions gathered from the feedback replies (question 1).

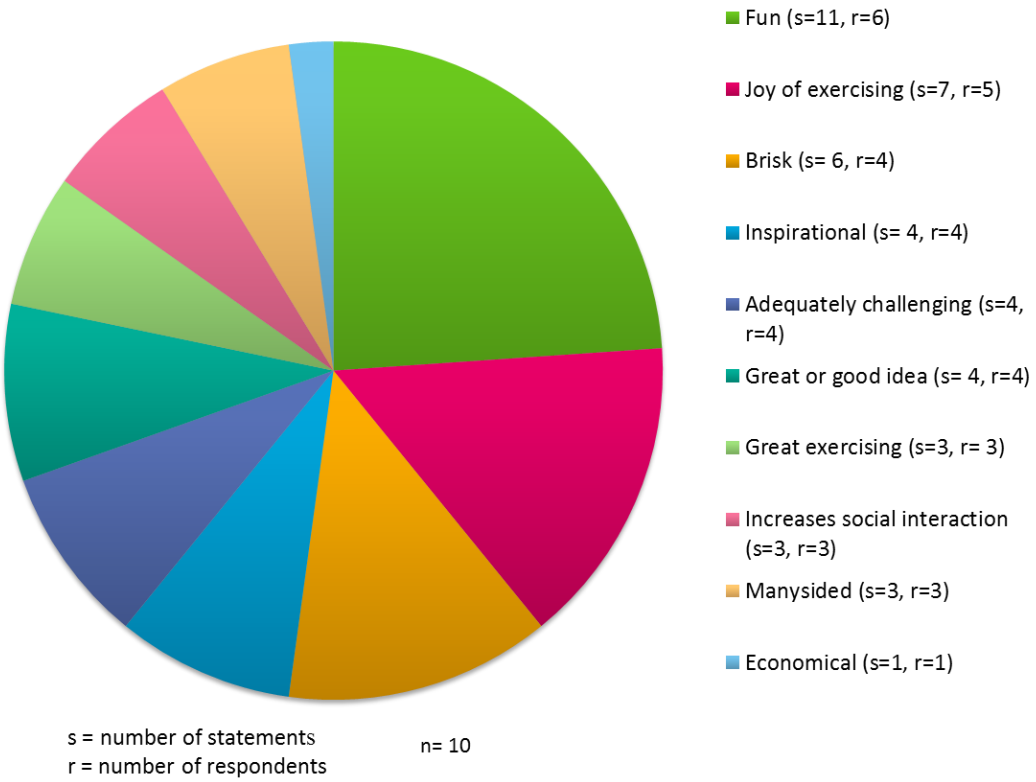


Figure 5. Experiences of Twin-Stick Exercising: the number of statements in each category.

> *The session was fast, exciting, and sweaty. It seemed that the participants enjoyed. In addition, the idea presents well the use of sticks in pair work.*
>
> *Exercising was fun and it did not concentrate on any disability, but the emphasis was on the joy of moving. In my opinion the theory behind the idea is good and functional.*
>
> *Speedy, cheerful, brisk, increases and enables social interaction. Excellent idea and economical to implement.*

Second part of the feedback concentrated on the possibilities and ideas for adaptations (question 2). Several target groups were suggested by the respondents. According to those Twin-Stick Exercising would be suitable for people with visual impairment (n=3), motor coordination impairment (n=3), autism (n=2), neurological disorders (n=2), or cognitive impairment (n=1). Moreover, respondents experienced the exercising beneficial for movement facilitation, and the possibility of guiding without touching. Additionally, practicing rhythm and coordination (n=3), and reciprocal movement (n=1) were mentioned in the feedback. Twin-Stick Exercising

was considered as profitable in the working life connections, and its ability to be modified was pointed out in each of the ten replies (n=10).

> *The exercise and dance can easily be adapted to our deaf-blind pupils, which is a great experience for us. 100% we will do the "Stick exercise" here.*
>
> *I see a number of potential applications. In terms of specific populations, Twin Sticks could work well with: vision impaired people, people who have motor coordination or cognitive impairments working with a non-disabled or minimally impaired partner to help 'guide' movement, and young people who have autistic spectrum disorder who resist or dislike direct contact or touch with another person.*
>
> *I could use this exercising idea with my neurological clients and practice the reciprocal movement, rotation of the thoracic spine, range of movement in shoulder joint etc.*

Some of the feedback replies state that a similar way to exercise with a partner and two sticks is already in use at some instances. One respondent reports that it is carried out in Nordic Walking and water running sessions. Another respondent carries out similar exercising in physical education and activities for special groups. Additionally, idea of "follow the leader" modification was mentioned in two of the feedback replies. First reasoning was that the other person guides the activity and the other one senses the movement through the sticks. Second argument was that in this case the exercising would not be connected to rhythm, but takes it to another perspective.

The difficulty in counting was pointed out by one respondent. When the exercising is carried out in form of choreography, counting beats is required, and counting eight notes is the most common pattern. According to the feedback, this is challenging for some people with special needs, in this case persons with deaf-blindness. However, the respondent states that it is possible to adapt the idea of Twin-Stick Exercising even for that target group.

Lastly, the interpretation and conclusion of the experiences from the participants' point of view were reviewed. First of all, the amount of replies was satisfying; 59 percent of the questionnaires were returned. The professional distribution of the respondents was divided in to three main categories: physiotherapy students 40

percent, physical educators/teachers 30 percent, and other professionals in the field of APA or sport science 30 percent.

As participation in the Twin-Stick Exercising session was voluntary, it suggests there was interest towards new experiences in that particular field of activities. Therefore, it is assumed that the respondents were motivated to answer the feedback questionnaire as well. Moreover, the answers were thorough and explained the experiences and thoughts adequately.

There were no negative experiences reported among the answers, which raises doubts about the reliability of the feedback. One way to interpret that fact relies on the experienced professional benefit by the subject matter. Those participants who found the session professionally interesting took their time to answer, and vice versa. The other possible explanation for non-answered questionnaires is that the email addresses traced were incorrect.

The respondents are involved in the professional target fields of Twin-Stick Exercising. The positive answers related to the working life connections are especially valuable for the author. If the response had been the opposite, that no working life connection was seen by the professionals, future plans for the idea would have needed a serious rethinking. Finally, the amount and contents of the answers related to adaptation possibilities were pleasing. Especially, the author received support for the ideas concerning the target groups of the adaptations. All in all, the feedback collection and analysis provided the information desired.

6.4 Feedback from the international network

There are several modes to receive and read the feedback from the websites. Firstly, the description of Twin-Stick Exercising, written by Ken Black and Peter Downs, on the website of The Inclusion Club is considered as feedback (Picture 5) (Website of The Inclusion Club 2012).

Picture 5. Presentation text of Twin-Stick Exercing on The Iclusion Club website (Website of The Inclusion Club 2012).

> *During EUCAPA 2012 Niina Mäkelä from Finland ran a session on Twin Sticks for conference participants. Ken had his trusted camera there and managed to get an interview with Niina and record the practical session. Our impression is that Twin Sticks is an incredibly simple yet potentially hugely effective concept.*
>
> *Twin Sticks has great potential in a variety of contexts, needs minimal equipment and the benefits of this type of exercise activity are pretty clear.*

In addition, the writers encourage the website visitors to give feedback, and share their ideas of possible adaptations. (Website of The Inclusion Club 2012).

> *I'm sure that you can think of many more possibilities. Try it, and let us know! We can pass on any suggestions to Niina through The Inclusion Club.*

Secondly, the YouTube videos can be considered as one type of feedback, based on the amount of display times. For example, by September 15th 2012 the Twin-Stick Exercise video has been displayed 185, and the interview 60 times. This feedback is only numerical, and does not explain why the video was displayed; based on interests or by chance. In addition, the webpage contains a simple method to give feedback. The webpage visitor may evaluate the video clip by ticking symbols for either like or dislike. However, by September 15th 2012, neither the exercising video nor the interview had been evaluated. (Website of YouTube 2012.)

7 DISCUSSION

7.1 Developmental ideas for adaptations and future plans

In this thesis the developmental ideas and future plans are connected to each other. Some ideas and thoughts for adaptations are reflected partly on some theoretical background, and partly on the feedback received.

Firstly, the idea of Twin-Stick Exercising could be adapted to persons with visual impairment. Another type of guidance through the sticks might increase the feeling of independence without being touched by another person. From the didactical point of view visually impaired person could guide the exercising as well, and have the experience of being the leader, and not always led by others. Furthermore, Twin-Stick Exercising carried out with sighted people enables inclusion in a group activity.

In case of adapted dance persons with visual impairment should receive instructions both through touch and verbal guidance. The reliance on hearing is pronounced in persons with visual impairment, and therefore they often understand the rhythm and music fast. (Rintala et al. 2012, 285-286.) Therefore, Twin-Stick Exercising could be suitable option for adapted dance training, based on the similarities in guidance methods, and usage of rhythm.

The idea of not having two identical sticks could be used in modification for persons with visual impairment. In this case, the material of the stick could be changed to e.g. rubber or wool. While having a grip on the stick the participant feels the difference in material. Thus, the verbal instructing could be based on the name of the material.

Secondly, thoughts about Twin-Stick Exercising and persons with hearing impairment will be viewed. Persons with hearing impairment are incapable of hearing the rhythm, but are able to learn to understand and feel it (Rintala et al. 2012, 285). The visual guidance should be emphasized in dance teaching as information is absorbed though vision. Therefore, Twin-Stick Exercising might be useful dance training method for persons with hearing impairment. In this case, the hearing

partner supports the understanding and experience of rhythm by initiation and guidance through the sticks. Moreover, using the color codes in the guidance could be beneficial for this target group, not only in dance, but in rehabilitative settings as well.

In addition, adapting Twin-Stick Exercising for persons with intellectual disability is discussed. Rintala et al. (2012, 282) report that, using equipment in music activities is experienced as motivating factor by people belonging to special groups. For example among persons with intellectual disability the use of equipment may improve the ability to concentrate on or perception of the movement (Rintala et al. 2012, 282). Consequently, holding two sticks with a partner as in Twin-Stick Exercising might be beneficial for concentration and understanding of the movement. Furthermore, additional training in motor skills and one-to-one instruction can benefit students with disabilities (Lieberman 2009, 103). With Twin-Stick Exercising both motor skills and two roles – being the leader and being led – could be practiced.

The idea of applying Twin-Stick Exercising to autistic persons' rehabilitation and physical activity was raised up in the feedback. Persons with autism react to physical touch differently, and for some it is an uncomfortable experience (Lieberman 2009, 148; Rintala et al. 91). Therefore, it is logical idea to try the guidance through sticks instead. Exercising with partner and holding the sticks might enhance the ability to concentrate with this target group as well.

According to Rintala et al. (2012, 282) persons with intellectual disability or autism may have problems related to body awareness. Twin-Stick Exercising could offer a new way to practice body awareness by experimenting the different movements of the body. Additionally, in the rehabilitative settings the use of rhythm and dance is possible to leave out from Twin-Stick Exercising if required.

Next, some thoughts about neurological disorders and Twin-Stick Exercising are shared. First thing that occurred to me was Parkinson's disease. Bradykinesia (slowness of movement) is causing the absence of arm swing in gait with persons suffering from Parkinson's disease. Moreover, postural changes and gait disturbances occur in this condition. (Stokes 2004, 205-206.) Based on the articles, music and

rhythm may improve balance and the ability to walk in Parkinson's patients (Shulman 2008; Tufts University Health & Nutrition Letter 2001). Consequently, testing Twin-Stick Exercising in a modified way in the rehabilitation of Parkinson's disease patients would be interesting.

Furthermore, there were ideas of applying elements of Twin-Stick Exercising in relearning the gait or upper limb movements in stroke patients. For example, hemiplegic patients could exercise with the help of physiotherapist, and use the hemiglove. In such cases the safety aspects should be carefully considered as persons with hemiplegia might have increased risk of joint subluxation, altered sense of touch and pain. The matter could be re-evaluated more thoroughly in the future.

Twin-Stick Exercising could be suitable way to exercise for elderly people as well. The sticks and the partner offer support for balance, but the exercising could be carried out in sitting as well. Moreover, the presence of the partner or group enhances social interaction.

It is important to take the items of safety in to account in all these ideas. Twin-Stick Exercising has been implemented only with adults without any special needs so far. Therefore, it would be interesting to implement these adaptation ideas, and receive feedback from the experiences. In addition, one developmental idea is to consider what would be the best way to situate the participants in space. When Twin-Stick Exercising is carried out in a group, half of the participants have their backs against the instructor. Thus, the optimal placing in the room is still an unsolved issue.

Finally, I want to point out that Twin-Stick Exercising is primarily designed for people who enjoy the rhythm and dance influenced exercising. Because we all are different, plenty of different variations are needed in the field of physical activity.

7.2 Own thoughts

The starting point of this thesis process was interesting. Firstly, I created the warm up for the stick training session, which evoked additional ideas for pair exercises

with two sticks. Later on, when I started the literature review I was surprised to see many of “my ideas” already published in the stick exercising books. Even in the source from 1933. This reminded me of something I learned during my dancing career: all the movements in the world have already been performed, but you need to find out the innovative ways how to present them. Consequently, I decided to apply that understanding to this Twin-Stick Exercising project as well. I had a chance to combine my skills in dance, group instructing, and physiotherapy in this project. It has opened new ways of thinking and gradually made me trust in my own professional abilities in these areas.

All in all, this final thesis process taught me a lot. The most challenging part was the written report. However, I learned a great deal about the writing process and to respect the academic writing. It was challenging to choose the research and analyzing methods, and it required a lot of logical thinking and individual solutions. Anyhow, the feedback survey provided valuable results. As contrast, throughout the process the practical parts were the easiest for me to create and implement. Integration of harder and easier things took me through this thesis process.

Especially I appreciate the opportunity to participate in the EUCAPA congress, and all the phases which led to it. The applying process itself was a lesson. Writing the abstract was completely new task for me. Fortunately my lecturer and thesis supervisor Tarja Javanainen-Levonen, PhD in sport sciences, took part in the writing process, and instructed me how it should be followed through. Nevertheless, the participation in the international congress - from the call of abstracts to the implementation, and closing report - was an educating experience. The practical presentation itself was a unique opportunity to present my idea, and make contacts in the field of APA.

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APPENDIX 1

euCAPA | European Congress of Adapted Physical Activity
KERRY IRELAND MAY 6-8 2012

"Putting Practice Based Research into Action"

CARA APA Centre
Institute of Technology Tralee
South Campus
Tralee
Co. Kerry

Re: European Conference in Adapted Physical Activity 2012 Abstract Acceptance

22nd of March 2012

Dear Nina Makela

Following the review of your practical abstract by the EUCAPA scientific committee your abstract titled "Twin-Stick exercising - an innovative way to enjoy the rhythm and facilitate movement in your partner" has been:

1. **Accepted as presented**

Once all authors have been confirmed you will be notified of the presentation criteria and all other details specific to presenting at this event. Please confirm that you intend to present this postert.

Please note at least one author must attend the conference.

Please confirm that you intend to present.

If you require further information, please do not hesitate to contact me:

Linda Raymond
EUCAPA Conference Coordinator
Email: eucapa2012@ittralee.ie
Phone: (00353) 66 7145647

Yours sincerely,

Linda Raymond

Linda Raymond

Twin-Stick Exercising

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Working out individually with a stick – even in a group activity – has been a traditional way of exercising: for example in Finnish male group gymnastics more than hundred years ago, for promoting posture or assist in stretching, and later on for training skills in weight lifting. The idea of Twin-Stick exercising was created by the first author, a physiotherapy student, with an education of a professional dancer, during a course in didactics of physical education at Satakunta University of Applied Sciences Pori, Finland. The aim of this innovative practical session is to share the experience of Twin-Stick exercising with the audience. Twin-Stick exercising demonstrates a new way to utilize two plastic gymnastic sticks in exercising or even dancing with a partner: both having a grip in the stick, facing each other. In Twin-Stick exercising the emphasis is on social interaction and reciprocal movement. Naturally, the level of facilitation provided by the more "skilful" partner (related to coordination, sense of rhythm, level of experience etc.) enhances the other partner's performance. Twin-Stick exercising might be carried out in recreational settings with a large group of equal participants, as well as in more intimate rehabilitative settings with an instructor and a client. Therefore, Twin-Stick exercising offers an option in the field of APA modified to persons with extra need for support in physical activity. This could be a suitable way of working out in an innovative way with persons with visual impairment or persons with intellectual disability in various settings in the field of APA. In this workshop, participants are offered an option to try out some simple Twin-Stick exercising movements aiming at certain choreography. The aim is to enjoy the rhythm and facilitate movement between partners. The choreography will be demonstrated through a video in the beginning of the session. In the end of the session, there will be an opportunity for the participants to make use of a simulation package for visual impairment.