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**Creating a Peer-Instructed Aquatic Fitness Programme for Participants 65 Years Old  
and Older**

Thesis

Kajaani University of Applied Sciences

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<p>The purpose of this thesis was to create an aquatic fitness programme, which would be instructed by peer instructors who are 65 years old and older. The thesis was commissioned by the City of Kajaani. The aim of the commissioner was to modernize the previously used programme and introduce new ideas in peer-instructed aquatic exercises, which would also be used for marketing by the City of Kajaani. The author's aim was to develop her competence in arranging aquatic exercises for the elderly. From the Kajaani University of Applied Sciences point of view, the aim was to provide students with a balance between the vocational skills necessary for employment and the knowledge necessary for post-graduate study and lifelong learning.</p> <p>The theoretical part provides an overview of aquatic fitness programmes and discusses the structure of multilevel workouts, physiological aspects of aging and aquatic fitness guidelines. Thus, it introduces an effective way for creating an aquatic fitness programme for the elderly.</p> <p>Two different research methods were used: the qualitative research method was used to get familiar with the peer instructors and the product development process was used to create, develop and implement the product. The final product includes aquatics exercises for all muscle groups and introduces possible modifications for the elderly. With the help of the product, peer instructors can easily instruct water exercises which the elderly can easily follow. The product will be published on the official website Kaukavesi, information desk and Facebook page of Kaukavesi.</p>	
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## PREFACE

“We stop training not because we get older – we get older when stop training”

-Gloria Swanson

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## 1 INTRODUCTION

Water aerobics is a form of aerobics exercise in a swimming pool. Today it is the most effective and popular tool for those who want to maintain a healthy body, lose weight and restore health while working all the muscles of the body. (White 1995, 21.) Aquatic exercise is a low-impact activity that takes the pressure off the bones, joints and muscles. Water offers natural resistance, which helps strengthen the muscles. (Gibson & Hoeger 2012, 2.)

The majority of the available researches and articles describe the benefits of water exercises for people with various diseases and back pain (Bergamin, Zanuso & Alvar 2012, 1). However, there is a lack of information about aquatic exercises for healthy elderly who also want to take part in aquatic sessions. It is an important issue that should be taken into consideration many countries.

Finland is one of these countries, which attracts retired or elderly people in physical activity life. The City of Kajaani has many local volunteers working, especially pensioners, who are very interested in physical activity (Salto-youth 2015). Kaukavesi is a big swimming pool in Kajaani, which assists the commissioned organization by offering an opportunity to perform aquatic fitness sessions for retirees. The commissioner came up with a unique idea to provide peer instructors to implement these sessions. Peer instructors are individuals who offer others their time and support in hopes of empowering themselves and those with whom they share similar life experience to take advantage of physical activity (Cforr 2015).

Peer instructors have to keep pace with the latest development in the fitness industry. Thereby, this study has changed the previous method of peer instructors running workout session for elderly. In the future, it will draw more attention to elderly population, according to the purpose of the commissioner.

The purpose of this thesis was to create an aquatic fitness programme, which would be instructed by peer instructors who are 65 years old and older. Besides, it would increase an efficiency of the training process for elderly people. The main goal of an aquatic programme is to promote a healthy lifestyle that includes physical development and mental health (Fawsett 2005, 1).

The aim of the commissioner was to modernize the previously used programme and introduce new ideas in peer-instructed aquatic exercises, which would also be used for marketing by the City of Kajaani. The author's aim was to develop the competence in arranging aquatic exercises for the elderly. The student proved the essential knowledge of aquatics fitness industry while working with elderly people. Moreover, the author has learnt the product development process and qualitative research method, which were essential aspects of this study. Based on the theme of the thesis, the author is willing to work as a swimming coach in the future.

## 2 OVERVIEW OF AGING AND PHYSICAL ACTIVITY

Training to become a physical activity instructor of elderly starts with an overview to the science of aging and knowledge about physiological changes of the aging process and the significance of physical activity (Jones & Rose 2005, 1).

### 2.1 Defining Old Age

There are various terms and definitions of old age, but commonly it is adults ranging from 55 to over 90. Old ages include 4 aspects like chronological, biological, psychological and social. (Posner 1995, 4.) Chronological age is measured in years, months, and days from the date of birth. When you give somebody your age according the calendar date on which you were born, so you are giving him or her your chronological age. (Jones & Rose 2005, 6.)

In comparison with chronological age, biological age is determined by physiology. It is caused by changes in the physical structure of the body in addition to changes in the function of motor skills and sensory awareness. (Whitbourne 2012, 31.) Besides, biological age is described the position of the individual along his life span and his capacity for survival (Gire & Eyetsem-itan 2003, 30). Thus, biological age would have certain similarities with chronological age, but also to some extent it would be independent of it (Elnoamani 2013, 168).

However, chronological age might fall behind of psychological age if individuals feel older than they are. An explicit example is adolescents. (Posner 1997, 116.) According to this, psychological age is a description of the level of adaptation to the condition of human society related to the level of intelligence, learning skills, motor skills, feelings, and others (Silverstein, Bengtson, Putnam, Putney & Gans 2008, 245).

The social age would be correlated with chronological age, psychological age and to some extent it would be correlated with biological age (Bytheway, Keil, Allatt & Bryman 1988, 155). Social age is related to social achievements of the individual, such as career, social and marital status and so on. It is compared with the average norm for its peers. (Infeld 2002, 89.)



## 2.2 Benefits of Physical Activity for Older Adults

According to scientific research, in 2010 heart diseases were the main cause of death in the age groups of 65 year olds, often followed by cancer, chronic respiratory diseases, cerebrovascular diseases and diabetes (Tovin, Wolf, Greenfield, Crouse & Woodfin 1994, 23). Based on the research, physical activities reduce a risk of several diseases (Farley, McLafferty & Hendry 2011, 11). Regular physical activities have many benefits for older people. They maintain a health and physical independence and improve a high quality of life. (Chiras 2003, 2.) Daily physical activities prevent the elderly from heart attacks by strengthening a heart muscle, lowering blood pressure and improving blood circulation. By reducing body fat, physical activities can control blood pressure and prevent diabetes. (Atwal & McIntyre 2013, 187.) Besides, appropriate workout builds more muscle and improves the body's ability to burn calories. Also, systematic exercises help to prevent back pain by increasing muscle strength and improving flexibility and posture. (Hinchcliff, Kaneps & Geor 2013, 8.)

However, physical activities have to be combined with proper nutrition, otherwise it may cause health problems especially among obese people (Morley 2015, 401). Daily physical activity is also considered vital for preserving mental health. It helps to decrease overall tension and improve the ability to sleep, which in turn reduces stress. (Sullivan & Pomidor 2015, 3.) Since physical activity produces endorphins, which act as painkillers. Even short-term aerobic exercises have anti-anxiety effects. (Eysenck 2004, 136.)

While searching for the most convenient environment for elderly to develop the different components of fitness without causing injury has been difficult for participants. Based on numerous scientific researches, about half of the people who start exercising were drop out in 6 weeks as a result of injuries. (Frank, Engelke & Schmid 2003, 8.) Older adults especially with joint problems should eliminate pounding or jarring while doing physical activities (Schutzer & Graves 2004, 1).

### 3 PHYSIOLOGICAL ASPECTS OF AGING

The science that explores the process of aging is called gerontology. Aging is a natural process of organism's changes with time. (Orr 1997, 33.) Different body organs and systems decline individually. It depends on certain factors as genetics, nutrition, and psychological living environment. (Wakabayashi & Groschner 2013, 103.) The good news is that much of the decline is preventable through participation in physical activity (Jones & Rose 2005, 38).

#### 3.1 Muscle Function

Age-related muscle alterations are very complex. They include various features and mechanisms affected by internal and external environmental conditions. (Lynch 2010, 137.) These muscle changes differ from injuries, chronic diseases and impairments. The loss of muscle mass can be clarified at the cellular and molecular levels. (Rattan & Kassem 2007, 80.) One of the most distinguishing features of the elderly is the presence of skeletal muscle weakness (Brooks & Faulkner 1994, 432).

As the body matures, changes occur in body composition while increasing body fat and decreasing muscle and bone mass. This is reflected on visual and hearing function, physical function, increased fatigue and depression. (Conn 2011, 843.) Besides, the risk of disability and loss of independence are significantly raised (Cook 1989, 438).

Based on recent studies, central nervous system, neuromuscular function, and numerous cellular and molecular changes impair muscle strength and power production (Kauffman 2007, 10). Thus, older people have a limited mobility, slow gait speed and increased threat of falling and hospitalization (Masoro 1999, 94).

Sarcopenia is the age-related loss of functional capacity, mobility, and independence (Nutr 1997, 127). The scientific research has focused on involvements to slow down sarcopenia in older adults. Their evidence supports that physical activity within the older person's limits helps maintaining the overall health and slowing down the muscles aging. (Orr 1997, 38.)

To sum up, aging is accompanied even in healthy elderly people. It is caused by physiological changes that typically lead to a reduction in muscle mass and muscle strength. (Booth, Weedem & Tseng 1994, 556.) It is a result of functional decline with age (Nutr 2015, 116). Thus, it is necessary to assist in the performance of daily activities (Brooks 1981, 79).

### 3.2 Bone Mass

Skeletal muscle changes influence on the posture and walk. Older adults lose bone mass through a lack of calcium and minerals. (Golczewski 1998, 101.) Therefore, the spinal cord becomes curved and bone thinner. As well as joints lose fluid and become stiffer and less flexible. (Schwarzbein & Deville 2010, 180.)

Bones become more brittle and elderly people may easily get different type of fracture. Moreover, the risk of injury is increased due to instability and loss of balance. (Mundy & Dunitz 1999, 2.) Joint changes have almost all elderly people. These changes may lead to inflammation, pain, stiffness and deformity. (Simson, Wilson, Hermalin & Hess 1983, 40-42.)

Inactive elderly people may have weakness or involuntary movements. They move slowly and get tired quickly because of lack of energy. (Shephard 1997, 448.) Thereby, a moderate exercise slows and prevents problems with the muscles, joints, and bones by maintaining strength, balance and flexibility (Jackson, Morrow, Hill & Dishman 2004, 305). Not only physical activity helps bones stay strong, as well as proper nutrition with plenty of calcium (Simopoulos 2004, 63-69).

### 3.3 Joint Mobility

Flexibility is strongly correlated with age (Araújo 2004, 9). A decrease in flexibility was observed across ages 55 to 86 years, but it dramatically declines after 70 years (Stathokostas, Little, Vandervoort & Paterson 2012, 28). Flexibility is the absolute range of motion in a joint. It is affected by a health of tendons, ligaments, and muscles around the joint. (Lone & Sajatovic 2008, 251.)

One of the major reasons of joint stiffness is a contracture. Also, it can be seen in ligaments, tendons, and skin that restrict normal development. (Clavet, Hebert, Fergusson, Doucette & Trudel 2008, 693.) Besides, a tissue around the joints is becoming thicker through age-related changes. This reduces the joint's range of motion. (Fulmer, Ashley & Reilly 1986, 56.) Also, cartilage decreases their function around certain joints (Rawlins & Kessler 1986, 253). All of these can lead to immobility and deterioration of flexibility (Jones & Rose 2005, 45). Additionally, it maximizes the possibility of arthritis and osteoporosis (McFarland & McFarland 2003, 33).

Overall muscle mass begins to reduce in the middle age. This depletion can decrease the strength and easy of movements that are vital maintaining flexibility. (Saxon, Etten & Perkins 2014, 52.) Muscles react slower in old age consequently elderly have to be engaged in regular physical activity to ensure flexibility (Kaeberlein & Martin 2015, 434). Fatigue is accompanied by depleted muscle mass, which can reduce enthusiasm to exercise (Whitbourne 2002, 87).

### 3.4 Cardiovascular and Respiratory Functions

The effect of age on the cardiovascular system is the variation of aging process itself from the presence of specific disease states. It is the dominant risk factor for cardiovascular diseases such as atherosclerosis, diabetes, and ischemic heart disease in humans. (Najjar, Scuteri & Lakatta 2005, 1.) These pathological conditions increase with age, because the changes of the heart throughout life are the result of multifactorial events (Olivetti, Melissari, Capasso & Anversa 1991, 1560). Intrinsic cardiac aging leads to structural and functional impairment of the heart in older adults (Chiao & Rabinovitch 2015, 1). Aging is accompanied with changes in numerous of structural and functional properties of large arteries, consisting of diameter, wall thickness and stiffness. These changes are risk of factors for the presence or progression of cardiovascular diseases. (Wantz & Gay 1981, 299.)

The heart is less able to adjust to hemodynamic challenge. Mitochondrial oxidative phosphorylation may be reduced in the presence of certain diseases. However, the overall size of the heart does not increase with age and only the left ventricular wall may decrease slightly. (Wei 1992, 1735.)

The effect of aging on the respiratory system is related to those that occur in other systems. The human respiratory system is made up of organs and tissues responsible for taking in oxygen and expelling carbon dioxide. (Bondy & Maiese 2010, 134.) The main organs and parts of the respiratory system are the lungs, the airways, connected blood vessels and the muscles, which carry out this exchange of gasses as human breath. There is a disintegration of the lung itself that might be a reason of the declined lung elasticity related with age. (Conn 2006, 728.) At the same time, abundant studies suggest that respiratory decline in elderly is mainly through physical inactivity. In contrast to physical activity habits and aging can slow down aging effect on these systems. (Chan 2006, 1251.)

The effects of aging on the respiratory and cardiovascular system are widely studied. The significant decline in physical activity of elderly is obviously connected with these changes as well as with functional and structural alterations. (Jones & Rose 2005, 51.) Thus, older adults can feel limitations of daily living and physical activity. Even though daily physical activity has possibility to reverse some of these alterations, age-related changes in the human body have to be prescribed for elderly before. (Lobo 2010, 3.)

#### 4 PEER INSTRUCTORS

A peer instructor is trained peer who proceeds as a mentor for those seeking physical activity or sustaining recovery (Higbie 1980, 5). Instructors can be healthy elderly who like to be engaged in moderate physical activity or individuals who have had the same age-related changes or diseases as their peers (participants). Through the coaching process, peer instructors provide physical exercises for healthy elderly to maintain their health condition and prevent age-related changes. At the same time, they assist participants in recovery process by removing barriers, connecting to the recovery community and engaging in supportive services. (Cforr 2015, a.)

Peer instructors propose a unique opportunity to build relationships of equality, trust and confidence. Moreover, a peer instructor incorporates their personal age-related changes or recovery experience into supporting, empowering and educating the participants. Besides, a peer instructor values peers' individual beliefs and supports them in finding out a self-directed trip towards targets or recovery. By modelling programme, peer instructors communicate with their community to meet the different needs of every individual. Peer instructors empower their peers by encouraging and assisting them in achieving goals. (Cforr 2015, b.)

Peer instructors work with individuals seeking entertainment in their routine life by providing physical activities and programmes, and by acting as allies, and role models by working to inspire them and keep up confidence (Cforr 2015, c.)

Peer volunteer's responsibility is to maintain a relationship of equality. To understand that being helpful to peers is also self-healing. In addition, peer instructors empower themselves and others by stating skill development, self-help, and a sense of community. The most important principle of working as a peer coach is to slow down aging process. (Cforr 2015, d.)

In sharing strengths and weaknesses, peer instructors have a benefit from the role of helper. Specific communities are searching for varied ways of thinking about previous experience of peer instructors, they can see peers as uniquely capable of listening with empathy and compassion, and offering support. (Cforr 2015, e.)

## 5 AQUATIC FITNESS PROGRAMME

Water aerobics is a variety of aerobic exercises performed in a swimming pool (Layne 2015, 1). In nowadays, it is the most effective and popular way to lose weight and stay fit. Water classes were first mentioned in manuscripts of ancient China. The students of Chinese monks practiced martial arts in the water. (Calainc 2015.)

Athletes actively have used water aerobics as part of their training. Glen Makuoterz is the famous athlete in the United States, who began to use it as a kind of sport. (Wilder & Brennan 2011, 155.) Approximately 50% of the runners in the USA national team used a variety of exercises in water as one of the most effective methods of preparation for the Olympic Games and other competitions. During the last decade, this type of physical activity has become extremely popular among amateurs. (Olympic 2015.)

In the modern society, the water has been used for physiotherapy of various illnesses. Approximately for 20 years, the water has been used as an alternative therapeutic treatment, so different water programmes have been developed. (Layne 2015, 7.) In nowadays, there are many programmes for different population groups. Annually, huge numbers of international aquatic fitness conventions are held all over the world. (Tarpinian & Awbrey 1997, 14.)

Physical exercises in the water are absolutely different from tradition exercises in a gym. Unique properties of water are good for overall health. (Casa 2011, 61.) Water improves functioning of all vital organs of a human body. It facilitates doing physical exercises and enhances health benefits. (Hopper, Fisher & Munoz 2008, 211.)

Aquatic Fitness is performance of aerobic exercises in a swimming pool. It requires to be submerged waist-deep or chest-deep in the water. (Jones & Rose 2005, 251.) The water provides additional resistance and support for a challenging workout. Thereby, it is ideal for increasing stamina, toning up all body, as well as getting rid of some stress. (Vella 2008, 35.) Aqua aerobics represents variations of trainings in the water targeted at cardiorespiratory endurance, muscular fitness and flexibility (Cooper 2012, 19). The whole range of water activities is good for all muscles with no bad effect on the joints (Walker & Helewa 2004, 276).

### The Main Features of Aquatic Environment

A characteristic feature of the water aerobics is the lack of solid support in a deep pool. In this way the human body is suspended. (McWaters 1988, 47.) It improves the locomotors skills (Kinder & See 1992, 80). Hydrostatic weightlessness helps strengthen the circulation in the joints, reducing the sizes of stagnation. Muscles work in the absence of solid support promotes longer preservation of epiphyseal cartilage in the limb bones. (Watkins 2013, 118.)

In contrast to swimming, the aqua aerobics is doing exercises in the horizontal or vertical position in deep and shallow water. Almost all the muscle groups that contribute harmonious development of muscle mass and mobility of the major joints. (Bircher & Goodwin 1999, 60.) The water pressure in the subcutaneous venous channel, deep diaphragmatic breathing and balanced state of the body are facilitated the flow of blood to the heart (Hoeger & Hoeger 2014, 310).

Due to water aerobics classes positive changes are occurred in the structure and function of the cardiovascular system, such as increasing the strength of the heart muscle and systolic volume of the heart. It has been seen a reduction in the frequency of heart rate at rest. (Cook & Cook 2008, 72.)

Aqua fitness sessions have positive value in hygiene. Water improves the skin respiration and stimulates the activity of various internal organs. (Foley 2003, 289.) Moreover, the water intensely stimulates the skin while doing vigorous movements. It can help reduce the appearance of cellulite, because it helps with fat breakdown and preventing fat. (Collins 2006, 124.)

Water aerobics classes help to develop such qualities as strength, endurance, flexibility and agility (Corbin & Lindsey 2007, 121). Moreover, regular aqua aerobics classes improve general physical conditions and increase vitality. This is confirmed by observing the physical conditions of individuals in experiment groups. (Spitzer & Hoeger 1990, 41.)

The main component of aerobics trainings is water. It creates favorable atmosphere by improving the efficiency of trainings in several times. (Harris 1996, 347.) At the same time, there is no high level of stress on the human body as in a gym. In this way, water aerobics classes are recommended for older people, pregnant women, and people with back problems, veins and joints. (Foz, Taylor & Yazdany 2011, 150.) The water activities help to relax, relieve muscular and nervous tension, and strengthen the nervous system (Walker 2013, 91). Also, there



is a peculiar water massage. Due to this the skin is perfectly hydrated and elastic. Water massage does not accumulate lactic acid in the trained muscles, so that even after the most intensive training you will not feel pain. (Simmers 2004, 19.) Despite that during a session worked almost all muscle groups. In addition, water workouts allow unloading the spine. (Meyer 2015, 73.) Thus, the water aerobics is the low-impact kind of fitness (Gibson & Hoeger 2011, 3).

Water aerobics is suitable kind of activities for people who have the disease as varicose veins. It relieves the sick blood vessels and improves blood circulation in the body to outflow of venous blood. (Archer 1998, 53.) Moreover, elderly people have joints diseases, so exercising in the water will only help to gradually adapt to physical activities, but also to develop the mobility of joints (DiNubile & Patrick 2005, 71).

Water aerobics is especially popular among people with obesity. They choose exercises in the water because of their high efficiency. This occurs by overcoming the resistance of water. (Ramdass & Shivkumar 2006, 88.) Also, the water temperature burns an additional amount of calories, which is lower than body temperature. Besides, it is important to note the psychological aspect. (Knopf 2012, 17.) Due to the fact that a large part of the body is covered by water, fat people feel more confident and comfortable. They are engaged with pleasure and in full force, because they do not hesitate of their big mass. (Ali 2012, 218.) Hydro massage, mentioned above, is also an excellent tool to combat cellulite. In combination with exercises, water aerobics can really help to get rid of it. (Simmers 2004, 19.)

Water aerobics is an excellent tool to lose weight. Due to unique properties of water is observed the effect, which was called 'duel-action'. (Asefesco 2013, 47.) The human body directs the energy internally (muscle work), and externally (to overcome the resistance of water). Thus, there is a constant release of energy that is required to maintain the temperature balance. (Katz 2003, 3.) We should not forget that the water carries out also relaxing function. It helps to remove the accumulated physical fatigue and emotional stress, as well as simply enhances the mood and relieves stress. (McCormick & Bonelli 2000, 47.)

## 6 TRAINING FEATURES IN AQUATIC ENVIRONMENT

Aqua aerobics includes physical exercises in the water, such as amateur or professional session (Brody & Geigle 2009, 26). Water exercises have absolutely diverse influence. It is caused by physical properties of water required certain time for adaptation in the water environment. (Krapivin, Varotsos & Soldatov 2015, 841.) It takes approximately from 5 to 10 sessions. In contrast to another physical activities, water exercises give a better health effects. Ruoti, Morris and Cole (1997, 52) defined beneficial effects such as “metabolism acceleration, venous circulation improvement, mood enhancement, coordination and balance development, joint mobility improvement, and rehabilitation”.

It is very important to have clear picture about properties of water and their impact on human's life support systems (Baun 2008, 12). Effectiveness of the aquatics programme will depend on how these properties are taking into account and how well they used to get benefits from the sessions (Brody & Geigle 2009, 206).

### 6.1 Water Temperature

The body temperature is 36.6 degrees C°. The body temperature is cooled to four times faster in the water than on the land. (Daniels 2014, 7.) The body temperature depends on the water temperature, the water level of submergence, humidity, and air circulation in the swimming pool (Casten 1994, 7). In addition, the percentage of body fat depends on the body temperature (Bates 1996, 28).

Human constitution belongs to one of the three types of the human body or might be mixed. For each human constitution should be selected proper training programme, because people with different types may respond differently to the same training. (Adami 2002, 24.) There are ectomorph, mesomorph and endomorph. Ectomorph has less fat and muscle mass, so this type is susceptible to cooling and can freeze at low intensity training. Mesomorph has greater muscle mass, so this type can maintain longer a comfortable body temperature. Endomorph has greater body fat, so it may cause overheating at too high intensity training in the warm water. (Norton & Olds 1996, 167.)

Warm water is made for relaxation. It increases muscle elasticity. Generally the warm-water temperature varies from 33 to 34 degrees C °. This water is most suitable for workout with children, older adults and pregnant. (Aquatic Exercise Association 2008, 3.) In contrast to warm water, cool water tones up the whole body. Usually the cold-water temperature varies from 20 degrees C ° to 33 degrees C °. It stimulates post exercise energy intake. This water is suitable for higher intensity trainings, but can impair the elasticity of the muscles and lead to convulsions. (Aquatic Exercise Association 2008, 5.)

For people with arthritis disease the recommended water temperature is from 29 to 31 degrees C °. However, slightly higher water temperature for older adults in low function programme. It varies from 30 to 32 degrees C °. From moderate to high intensity programme the water temperature is from 28 to 30 degrees C °, in contrast to low intensity programme, the water temperature varies from 30 to 31 degrees C °. (Costill 1978, 73.)

## 6.2 Water Depth

Water exercise is typically performed in a vertical position in shallow or deep water. There are many applications to appeal to a wide variety of participants. Deep-water sessions should only be held for skilled swimmers. Shallow water levels maintain body weight to work reducing the additional water resistance. Thereby, it is excellent for non-swimmers or amateurs. (Krautblatt 2009, 61.) There are differences between deep and shallow water, which are presented in the Table 1.

TABLE 1. Differences between deep and shallow water (Aquatic Exercise Association 2010, 181)

<i>Deep water</i>	<i>Shallow water</i>
It is performed in water depths.	It is performed in waist to chest depth.
The feet do not touch the bottom.	The feet are in contact with the pool bottom.

Flotation equipment is needed to maintain correct body position.	The equipment is used optionally.
There is no the force of gravity.	There is the force of gravity.
It is hard to control stable position of the body.	It is easy to control stable position of the body.
The buoyancy's support comes from the water.	The buoyancy's support comes from the bottom.

### 6.3 Hydrostatic Pressure

The body is affected by hydrostatic pressure under the water. The hydrostatic pressure improves the circulation of blood through the body. It eliminates increased blood flow to working muscles that occurs during the workout on land. (Robbins, Powers & Burgess 2008, 86.) Hydrostatic pressure improves blood circulation in the kidneys, stimulates urination and leads to reduction in the amount of body fluids. It can prevent the following diseases as cardiac insufficiency or heart failure, obesity, violation of protein metabolism, and kidneys disease. (Robbins, Powers & Burgess 2006, 142.) The increased hydrostatic pressure helps to take the lactic acid out of the cells and delivers it to the liver more efficiently (Wilks & Knight 2014, 339). Hydrostatic pressure stimulates venous return, which supports blood circulation. Due to this the heart rate does not reach the maximum value compared to workout in the gym. (Adami 2002, 8.)

During aqua aerobics session the pressure of the water resists the muscles that expand the chest for breathing. It enables a human to intake a greater volume of oxygen during land activities. (Buschbacher & Braddom 1994, 299.) However, it is not recommended for people with respiratory problems to exercise in the water (Voight, Hoogenboom & Prentice 2006, 364).

Hydrostatic pressure of the water helps to enhance venous return and cardiac functions, reduce training heart rate for a given workload, and create a training effect for the respiratory muscles (Ruoti, Morris & Cole 1997, 46).

#### 6.4 Water Resistance

The water provides excellent resistance for toning exercises (Gibson & Hoeger 2011, 29). The instructors incorporate this resistance into aqua fitness programme. It provides the strength in the muscles without additional weights. (James & Williams 2014, 22.) Furthermore, you can strengthen muscle groups with less joint stress (Baun 2008, 246).

Viscosity creates an equal amount of resistance in various planes of motion (Cotton & Goldstein 1993, 296). In the water, there is the opportunity to work on two groups of muscles at the same time, with the equal amount of resistance, using a single exercise. Therefore, it helps creating a better balance between the muscle groups. (Astrand, Dahl & Strømme 2003, 130.) At the end, the instructor can vary intensity of the training by changing shape, size, and speed of the working body parts. It can be used to enhance excellent progression for individuals at different levels of fitness. (Kinder & See 1992, 49.) Moreover, the water provides natural resistance, which can be beneficial for individuals with neurological impairments. Additionally, aquatic environment is perfect for muscle reeducation in old age. (Hou 2010, 298.)

#### 6.5 Buoyancy

While performing exercise in the water, the buoyancy supports individual's weight. It reduces stress on muscles, tendons and ligaments. (White 1995, 4.) Therefore, it is easier and less painful to perform exercise in the water. The buoyancy of water eliminates the effects of gravity. (Lancaster & Downes 2013, 67.) Approximately 90 percent of the body's weight is supported by water. It is excellent for elderly to have greater flexibility. (Higgins 2011, 253.) As a result, there is less impact on the joints during movement and can significantly reduce the injury and strain to most land-based exercises (Barsanti & Gualtieri 2006, 93).

To sum up, the main benefit of performing exercise in water is that it provides resistance in various planes of movement. This kind of physical activity is beneficial for elderly at risk from bodily stress. (Huey 1993, 8.)

## 7 INSTRUCTIONS FOR AN AQUATIC FITNESS PROGRAMME

Aqua aerobics sessions are scheduled in one-hour fragments. However, the length of training depends on the instructor. Aquatic fitness can adapt to individual needs, abilities or limitations. An instructor can modify the amplitude and intensity of movements, which meet the needs of participants. (Milford 2012, 19.)

### 7.1 Teaching Methods

There are two special styles used in teaching aquatic fitness sessions. A combination of both styles is used to facilitate the demonstration of the exercises as well as reduce the effective water immersion time for instructor. (Armbruster & Yoke 2014, 294.)

The deck teaching style provides the best instructional view for the participants with the least amount of effort for the instructor. This style is essential in water exercise since visual cues are as important as verbal cues for participants. It gives the instructor with a better view of the class participants and enables shorter learning period of time for the group participants. Demonstrated moves should be slowed to stimulate the increased resistance of the water. The instructor's position should not be limited to facing the class, but be adjusted to enable accurate instruction. Basically, it is necessary to demonstrate moves on the deck and let participants to practice moves within the water before getting into the water with them. (Armbruster & Yoke 2014, 296.)

The water teaching style provides the instructor with the same exercise medium as the participant allowing easier imitation of exercise movements. However, there is a disadvantage, which makes some difficulties for the instructor to perform the movements in a biomechanically correct way since the participants cannot observe the instructor's body movements. This might be an effective style with experienced participants as well as for short periods to perform water specific techniques. (Armbruster & Yoke 2014, 297.)

## 7.2 Technique

Ongoing efforts help to maintain the correct position of the body and strengthen the muscles of the torso without performing special exercises for the abdominals. The need is to constantly keep up a steady position of the body during exercise because it causes strengthening the muscles of the torso. Saving smooth body position requires power while moving in the water. To be the most effective training is necessary to teach participants how to support the smooth body position and correct posture. It also has particular application in everyday life. Preservation of proper posture throughout the day is very important. (Russian Aquatic Exercise Association 2015.)

Skills and motivations have a huge impact on the intensity of exercises. When students can correctly perform exercises, they will have better technique and learn how to use water resistance in the most effective way. The instructor should spend enough time by educating customers the correct exercise technique and demonstrate the correct performance of the movements. The result is a significant increase in efficiency classes. (Russian Aquatic Exercise Association 2015.)

The load on the muscles of the torso and legs greatly increases the maximum oxygen consumption ( $Vo_2$  max). The use of larger muscle groups increases energy consumption. They need more oxygen than smaller muscle groups. The instructor should be focused on the legs and torso to develop sufficient incentive for participants. (Russian Aquatic Exercise Association 2015.)

Rapid movements give a sense of a more intense workout by potentially possible isometric muscle contractions. The short and fast movements can create a sense of intensity, although these movements only simulate isometric muscle contraction. The best strength training can be achieved by muscles with full amplitude at an average pace. (Russian Aquatic Exercise Association 2015.)

The optimum working depth is determined by the structural features of the body. The percentage of body fat determines the buoyancy of the body. Each group member will have a working depth, which will depend on the buoyancy of his body. Each member of the group needs to have optimum working depth and intensity of movements, so participant can properly perform exercises. (Russian Aquatic Exercise Association 2015.)



Movements in the water significantly increase  $Vo_2$  max. When you move around in the water, you spend more force to overcome resistance than in static movements. The SWEAT formula will help to increase the intensity of workout. (Russian Aquatic Exercise Association 2015.)

### 7.3 Preparation

Water level varies from waist to chest level for beginners and intermediates and deeper water for seasoned participants. For deep-water classes, the participants should use flotation equipment. The skill level of the participants and the class purposes determine class level and water depth. As well as music tempo depends on participant's fitness level and should be among from 125 to 150 beats per minute for shallow water exercise. (Baun 2008, 226.)

A normal class should last about 50 to 60 minutes. It includes from 5 to 10 minutes of warm-up, full 30 minutes of cardio training and approximately 10 minutes of cool down and stretching period. The aquatic exercise should begin with simple movements to let the participants to become adapted to the buoyancy of the water. Also, exercises should not be complicated especially for beginners. (Adami 2002, 150.)

### 7.4 Safety

There are safety considerations for teaching participants in the water. Some are connected to the facility, others are target to clients, and others include teaching methods and the use of equipment. Instructors have to be acquainted with the properties of water and how they influence on exercise conditions to ensure that water exercises are safe and as effective as possible. (Jones & Rose 2005, 251.)

The aquatic environment should meet the needs of groups with different health concerns. A trained lifeguard should be on duty during the aqua aerobics session. Because water exercise is usually performed in waist-to chest-deep water, it is important that the pool bottom be graded. Instructors should discuss safety issues, particularly for participants who feel uncomfortable in the water. (Hoeger & Hoeger 2006, 268.) If the session is performed in deep water, the instructor has to be sure that participants have their flotation equipment adjusted properly. The instructor should inform participants of the location of deeper areas of the swimming

pool. Special care should be taken to avoid accidents in aquatic exercise settings. Thus, it is necessary to point out possible dangers and inform participants of the slippery nature of the wet areas. (Gibson & Hoeger 2011, 88.)

The aquatic fitness programmes should be avoided by individuals with compromised respiratory functions, severe hypotension, any infectious diseases, chlorination allergies, and open wounds. Additionally, it is very important to provide flotation devices for those who cannot swim. (Doro-on 2012, 323.)

## 8 RESEARCH TASKS

The purpose of this thesis was to create an aquatic fitness programme, which would be instructed by peer instructors who are 65 years old and older. The thesis was commissioned by the City of Kajaani. The aim of the commissioner was to modernize the previously used programme and introduce new ideas in peer-instructed aquatic exercises, which would also be used for marketing by the City of Kajaani. The author's aim was to develop her competence in arranging aquatic exercises for the elderly. From the Kajaani University of Applied Sciences point of view, the aim was to provide students with a balance between the vocational skills necessary for employment and the knowledge necessary for postgraduate study and lifelong learning.

The research tasks of this thesis were the following:

What kind of aquatic fitness programme would be appropriate for elderly people?

How to create the aquatic fitness programme?

How to give a new idea of water aerobics for peer instructors?

How to provide the final product for peer instructors?

## 9 PRODUCT DEVELOPMENT PROCESS

A product development process includes various activities that the organisation must do in order to create, develop and implement a product. It is focused on developing systematic approaches for instructing all the processes contained in getting a new product to market. (Jones 1997.) The main purpose of product development process is to involve modification of an existing product or its presentation that offers new or additional benefits to customers. A product development process consists of five basic steps: idea generation, prototypes, final design, marketing, and manufacturing. (Otto & Wood 2003, 11.)

### 9.1 Idea Generation

Idea generation is a continuous, methodical search for new product prospects. It involves describing sources of new ideas and methods for generating them. (Otto & Wood 2003, 12.) To generate the idea is the crucial part in the thesis process.

The author has been swimming for many years. It was logical to match the thesis idea with gained experience, knowledge and skills. But it was not enough for challenging aspect. The next step was to match swimming with another familiar scope, which would be a perspective for a future growth. Aerobic exercise is a physical exercise of low to high intensity workout that improves all elements of fitness (White 1995, 21). To combine acquainted spheres gave a general idea of this thesis. Water aerobics is the performance of aerobic exercise in shallow water with possible swimming movements, which are performed in swimming pool with professional instructor about an hour (Layne 2015, 1). To create an aquatic fitness programme was a favourable perspective for such creative personality.

Jarmo Kinnunen is the head of Sports and Youth Service Staff, who offered to get a new idea for peer instructors' aquatic exercises. A peer instructor is trained peer who proceeds as a mentor for those seeking physical activity or sustaining recovery. The peer instructors perform and empower other older adults by instructing aquatic fitness programmes in Kaukavesi.

Thus, the thesis was commissioned by the City of Kajaani. Sports and Youth Services are covered under the Education and Cultural Services. General Education, early childhood education and care services are also included in education and Cultural Services, as well as cultural activities. In the non-profit organization there are many local volunteers working, especially pensioners, who are very interested in physical activity. Local organizations and communities collaborate with the Sports and Youth Services through various contracts. One of these organizations is a swimming pool 'Kaukavesi'. Volunteers can do voluntary work in the sports services and sports organizations. Moreover, Sports Services provide exercise information and coordinate network cooperation in Kajaani. Exercise Services manage printing services and forms of support and grants. The City of Kajaani has agreements with different partners. The most significant partners are Otanmäki-Vuolijoki Society Union Association and Kajaani Spartak Association. Thus, the City of Kajaani offers great opportunities for a wide range of motion.

First of all, an introduction to aims of this thesis was discussed with the teacher supervisor. The selected topic was approved. Secondly, the meeting with commission party was appointed in the beginning of April. Fortunately, Jarmo Kinnunen and Tuovi Johansson-Huusko were commissioners and responsible persons of the peer instructors. The thesis idea was set out again for peer instructors and commissioners. The task of this meeting was to carry out a questionnaire for peer instructors that to be closely acquainted with them. The second task was to conclude an agreement with the commission party. Finally, the main task was to create a favorable impression and atmosphere before the serious work.

### 9.1.1 Qualitative Research Method

In this thesis, the used method was qualitative research. According to Bernard (1995, 13) the research method includes participant observation, in-depth interviews, and focus groups. The aim of this research was to deepen the understanding of peer instructors' teaching methods and analyze their personalities, experiences and perspectives as instructors. For finding those answers qualitative research offered the right tools.

The data was collected by a participant observation and in-depth interviews as theme field notes. First there were in-depth interviews and after that the peer instructors were observed independently to deepen the information about the subject. In-depth interviews are suitable

for collecting data on individuals' background, and experiences, particularly when the topic is being searched (Brennen 2013, 27). Consequently, the questionnaire was composed Appendix 1. The researcher explores a few general topics to help uncover the peer instructors' views but otherwise respects how the peer instructors answer to responses (Marshall & Rossman 1999, 108). The questionnaire was a flexible way to collect the data from peer instructors, who do not speak English.

In this thesis, a participant observation was suitable for gathering data on naturally occurring behaviors in their usual contexts (Pope & Mays 2000). Accordingly, the peer instructors were observed during their aquatic fitness classes. To combine participation in the lives of the people being reviewed by keeping a professional distance that allows sufficient observation and recording of data (Fetterman, 1998, 34). It was the optimal approach to be acquainted with their teaching method and physical conditions. The eight aquatic fitness sessions were observed and written by the permission from the peer instructor. Participant observation helps to analyse unexplored topic by explaining the behavior of people in a particular setting (Jorgensen 1989, 43). There were different aquatic fitness programmes, which varied between each other by an intensity level, special equipment, the presence or absence of music, and a group size. After each instruction, the written notes were precisely explored.

Content analysis is a method that can be used in a qualitative research (Tuomi & Srajärvi 2002). In this thesis the data was analysed by inductive content analysis, which moves from specific to the general. The preparation phase begins with choosing the unit of analysis. So, the author selected the unit of analysis that was a sentence. It was the most suitable way to analyse in-depth interviews. The organization phase is the next step, which includes open coding, creating categories and abstraction (Elo & Kyngäs 2007). In this research the data was read several times and made notes and headings to it. The goal of the categorization is to describe the phenomenon, to increase the understanding and generate the knowledge (Elo & Kyngäs 2007). In-depth interview was categorized separate to individual observations. Finally abstraction was done which meant formulating categories. In this research there were three categories, which related to the types of an aquatic exercise, such as strength training, aerobic training, and aerobic-strength training.

### 9.1.2 Results

In-depth interviews and individual observation were analysed separately. The questionnaire gave clear responses about peer instructors' working experiences, educations, teaching methods and way of thinking.

The peer instructors have distinguished in their working experience, which can be 2 years or 13 years. Mostly their participants were older adults and pensioners. Some of the peer instructors had sessions for people with breast cancers, asthma, respiratory diseases, and arthritis.

*“Aquatic fitness sessions were instructed in the old swimming pool since 2006. There were groups of participants with respiratory problems and asthma, older adults/pensioners (“Honkkarin Seniorit”) and group with arthritis problems (“Reumayhdistys”). “*

The main reason to be a peer instructor is a social integration. It empowers them and participants to be engaged in physical activity.

*“I have been interested in physical activity. I feel good when I give benefits for my clients and get back positive feelings. Social integration empowers me to work.”*

*“It helps me for maintaining my health. I like social integration.”*

From the peer instructors' opinions, the most important qualities in the existing profession are social skills and enthusiasm. Based on Mesorah (2002, 83), the enthusiasm has a positive influence on the lives of others. By being enthusiastic, as an instructor will be doing many acts of kindness. At the same times, an instructor will not even be aware that his or her enthusiastic state was helpful to someone else. This can add a dimension of motivation for developing a greater amount of enthusiasm.

Unfortunately, they have different teaching methods and change the content of aquatic fitness programme individually. However, peer instructors' participants always happy involve something new in long-standing programmes, but taking into consideration their age-related changes and health problems.

*“I use a good tempo and different equipment. The structure of my programme consists of a warm-up, muscular strength and stretching. I try to change the programme every 3 weeks. “*

*“I might have a music, if my participants agree. I work for all muscle groups. The programme can be changed, when my participants would like to.”*

The City of Kajaani and their communities provide for peer instructors great supports and opportunities. They assist the peer instructors to learn how to do things and encourage them to think about what they learn. It is an essential part for educators to teach ways to find and use information.

*“The City of Kajaani has arranged a training in Kainuun Liikunta.”*

*“I have done more than one course due to the City of Kajaani.”*

There are multiple methods to gather data. One primary approach involves writing field notes. (Burgess 1991, 192.) Templates helped to pay attention from unnamed exercises and movements that were very important to understanding a kind of the programme. One of the examples was written into the template Appendix 2. Observation furthers an in depth and rich understanding of the behavior of the peer instructors in aquatic fitness programmes. The individual observations strengthened the views that occurred in-depth interviews. Actual behavior is likely to be different from asking people what they do (Savage 2000). However, it was seen that the peer instructors are truly in good physical conditions. The teaching methods and approaches to their participants were unique, because participants might even have severe diseases and impairments. Nevertheless, the peer instructors were acquainted and prepared to each lesson in advance. Still, there were rough mistakes in their instructions, which could be solved by involving a new programme with a precise description and method of instructing an aquatic fitness programmes.

## 9.2 Prototypes

The next stage begins to create prototypes of these sketches that show the basic form of the product, but does not necessarily have to be fully functioning (Karol & Nelson 2007, 322). The planning was quite complicated. While working with people, especially elderly people, a person takes huge responsibility for their health. It was necessary to approach this issue with extreme caution.



First of all, the theoretical part is an integral part of the product development process. The theoretical part helped in demonstrating the overview of the aquatic exercises, structure of multilevel programmes, physiological aspects of aging, and instruction for an aquatic fitness programme. The researcher should properly study theory before choosing exercises and movements that would be appropriate for elderly people. After that, the lesson plan was compiled before practicing the selected movements.

The plan consisted of possible exercises and methodological guidelines for the peer instructors. Initially, there were listed 53 exercises for all muscle groups. After three weeks, these exercises were tested in a swimming pool. Fortunately, an advanced practical training was done in the top fitness club, where the student became a swimming coach and after a while an aquatic fitness instructor. The great experience and opportunities were gained during that time. The supervisor of a practical training place gave an advice and provided feedback, when the 53 exercises were explored and tested.

Russian Aquatic Exercise Association held an advanced aquatic course, which provided great knowledge and skills to create a high quality programme. Majority of the information was used for the product development.

Before product implementation, an examined group of the retired was found. An advertisement was published for clients in the top fitness club in Russia. The advertisement drew the client's attention by participating in the product development process. Many clients desired to be an examined group for trying a new product, which is going to be used in Finland. The supervisor of practical training made an evaluation form Appendix 3. The session lasted about an hour, where the selected exercises were performed. After analysing, the programme was not satisfactory for people with severe physiological changes.

Initially, the programme was directly targeted for the peer instructors as the target group, so the chosen movements should not be complicated for the demonstration. However, it was hard to understand for young instructor with great physical conditions. The peer instructors have different levels of physical activity and type of various diseases.

According to these issues, the selected exercises were not satisfactory improved. So the programme should consist of specific exercises that could cover all the muscle groups. The level of difficulty should be available not only for the retired with certain diseases, but also for healthy elderly, essentially for the peer instructors as the target group. Thus, a prototype of

the aquatic fitness programme was tested on the examined group again, but with Russian retired instructor. Unfortunately, a peer instructor is not popular profession in Russia, so it was hard to find such an instructor. However, the practical training place helped in solving this problem. Another advertisement was made for looking for a retired instructor or an experienced person in aquatic exercises. When the retired instructor was searched out, the same evaluation form was used to analyse the chosen movements, which would be included in the improved programme. After the instruction, there were many misunderstanding in the programme from the instructor's point of view. The programme seemed difficult for the demonstration, because required a lot of balance movements, endurance, and strength, as well as had a high intensity level. In order to solve the current issues it took about three weeks, because the programme was slightly restructured.

### 9.3 Final Design

A final design incorporates all the function that has been extensively researched. Many books, articles, and scientific researches were studied during creating a peer-instructed aquatic fitness programme. Obviously, the theoretical part showed an effective way for designing the product. But the most sufficient fragment was practical part, where the missteps were seen.

In the beginning of the product development process, the author chose 53 exercises. After analysing, the researcher faced with physiological issues of older adults. The retired instructor pointed out these concerns during the testing. According to these issues, the author chose abundant number of exercises with possible modifications. Thus, the peer instructors would vary them depending on their customers. The aqua fitness programme was called Aqua Shape. The programme had an intermediate intensity level. So, the peer instructors could find easier exercises in the proposed programme for elderly with severe diseases and also for beginners. Since the initial stage of an aqua aerobics session is to be familiar with an aquatic environment. After that, the customers will learn the elementary motions of body position without increasing acceleration and rhythm. All things considered, the Aqua Shape programme with modified exercises and their clear instructions was described in Appendix 4.

For advanced participants, the author used strength training with equipment such as swimming gloves and belts. The equipment gave an additional resistance for advanced participants.

Unfortunately, Kaukavesi does not have swimming gloves, but the peer instructors could offer them to buy it by taking into consideration a hygiene aspect in the swimming pool.

One of the most significant elements in water aerobics is a rhythm. Only background music can control tempo of customers and instructors. However, Finnish older adults were against background music, which they did not like. In the beginning, they clearly explained this fact in the questionnaire. According to the observation method, the author found that some of the peer instructors used a music background, but firstly asked for permission from their participants. Thus, author searched all popular music of 50-s, 60-s, and 70-s. The decision was made in favor of the most respectable group 'The Platters'. The rhythm for elderly is 110-125 beats per minute. This disk with proper tempo was given to the peer instructors as a gift from the student of Kajaani University of Applied Sciences.

Different factors made Aqua Shape programme interesting for the target group. Primarily the professional instructor performed the Aqua Shape programme for the peer instructors. The programme was translated into Finnish language, distribution was cost-free, and an implementation was done with new equipment. The purpose was to make the programme as convenient as possible. The Aqua Shape programme was divided into special exercises for the upper body, lower body, abdominal muscles and whole body. Exercises were performed from sixteen to thirty two times at a normal pace.

#### 9.4 Marketing

Marketing is the management process responsible for identifying, predicting and satisfying consumer requirements profitability. To achieve this, organisations need a marketing strategy. A marketing strategy has an effect on every part of an organization. It creates a value for others. This involves clients but as well as benefits employees and owners. (Reid & Bojanic 2009, 263.)

In this thesis, the product had a marketing task. The goal of commissioned organization was to attract more clients and promote the peer instructors by demonstrating their facilities. The idea was to make an advertisement which would have an appropriate format of the organisation and could draw customer's attention to the peer-instructed Aqua Shape programme. Before creating an advertisement it was compulsory to ask for permission about the publication

of a new product. When the author got an approval, the next stage was to find an advertisement template in Kaukavesi.

The meeting was held on 29.10.2015 with Ulla Pikkarainen, who has responsibility for a marketing section in Kaukavesi. The advertisement should contain the original logotype, autographic background, precise description of the programme, exact date and time. However, the advertisement was created in advance Appendix 5. The Aqua Shape programme will probably be used in the wintertime. The advertisement will be published on the official website Kaukavesi, information desk and Facebook page of Kaukavesi.

### 9.5 Manufacturing

The last stage was implementation. The attention was focused on correct programme demonstration Appendix 6. As a teaching technique, a demonstration was the significant part to get peer instructors to 'learn by doing'. Demonstrations could draw a learner's attention to the psychomotor skills needed to undertake delicate tasks in the future. Moreover, the demonstration was accompanied by explanations. It helped peer instructors identify appropriate ways of extending their knowledge and skills in the aquatic fitness industry.

The appointed instructing date was 26.10.2015 a Monday afternoon at two o'clock. This time was arranged by 'Kaukavesi'. The music, equipment, microphone and camera were prepared in advance. Unfortunately, only four peer instructors could come and take part in the Aqua Shape programme. The session lasted for 45 minutes. Finnish speaker assisted and translated the methodological instructions for peer instructors. In addition, the evaluation form was given to Finnish speaker to analyse the instruction Appendix 7.

After the lesson, printed versions of the Aqua Shape programme were provided to the peer instructors for learning. Moreover, to get more precise information about the Aqua Shape programme the author needed to create another evaluation form Appendix 8. Feedback is the information sent to an entity about its earlier behavior that the entity might change its current and future behavior to get the desired result. Feedback comes off when an environment reacts to an action or behavior. (Westfechtel 2003, 105.) In this thesis 'customer feedback' was the peer instructors' reaction to the researcher's product. By asking for feedback from the peer

instructors, it essentially motivated the researcher to perform better. To feel valued and appreciate being asked to provide feedback that could be used to motivate to build better-working relations with the peer instructors. In fact, there were even negative feedbacks, but it was actually constructive criticism and was the best find of feedback that could help to improve and increase the Aqua Shape programme.

The Aqua Shape programme to peer instructors was unique. Only five countries have almost the same peer-instructed programmes in the fitness industry. Through this study the peer-instructed programme may have the initial steps for further development.

### Resources and Materials

All the equipment and facilities were purchased and used by the author. For creating the aquatic fitness programme it was necessary to complete professional aquatic fitness courses. The course lasted for a week that to be familiar with an aquatic industry. It helped to create the high quality product. The finished programme was translated into Finnish language for the peer instructors. The next step was to purchase equipment for the future product process. The special equipment was needed for the Aqua Shape programme. As well as music was an important factor in the programme. The Aqua Shape programme required to be published on official website Kaukavesi, information desk and Facebook page of Kaukavesi. Thus, the signboard advertising was made.

TABLE 2. Expenses for the product implementation

Total costs	305 €
Equipment	20 €
Music	15 €
Signboard advertising	20 €
Translation	40 €
Aquatic Fitness Courses	200 €

## 10 DISCUSSION

The purpose of this thesis was to create an aquatic fitness programme, which would be instructed by peer instructors who are 65 years old and older. The thesis was commissioned by the City of Kajaani. The aim of the commissioner was to modernize the previously used programme and introduce new ideas in peer-instructed aquatic exercises, which would also be used for marketing by the City of Kajaani. The author's aim was to develop her competence in arranging aquatic exercises for the elderly. From the Kajaani University of Applied Sciences point of view, the aim was to provide students with a balance between the vocational skills necessary for employment and the knowledge necessary for postgraduate study and lifelong learning. Two different research methods were used: the qualitative research method was used to get familiar with the peer instructors and the product development process was used to create, develop and implement the product.

The final work helps to answer all the research tasks. The initial stage in the creation of a high quality product was the theoretical part. Many books, articles, and scientific researches were studied during creating a peer-instructed aquatic fitness programme. Obviously, the theoretical part showed an effective way for designing the product. But the most sufficient fragment was the practical part, where the Aqua Shape was improved.

An advance aquatic fitness course assisted in creating the Aqua Shape programme. The author focused on the selected exercises for the elderly with the practical training supervisor, who is a member of international conventions in the aquatic fitness industry. The flexible water exercises were available for the peer instructors. The author was able to find the best movements that needed to be included in the programme.

According to previous researches, the author found the similar studies that helped to manage some issues, which have been occurring during the product development process. Unlike an explanation from textbooks which require learners to visualise the process themselves, a demonstration allows the process to be observed directly, which in turn makes the learning process easier.

The demonstration was a valuable method to get the peer instructors to 'learn by doing'. It could draw peer instructors' attention to the psychomotor skills needed to undertake delicate

tasks. The demonstration from the author could provide peer instructors with opportunities to develop key scientific skills. The peer instructors were free to ask questions if they wished to do so. More importantly, demonstration was accompanied by explanations and methodical guidelines which are important for any instructor. The explanations could support the author to assess the previous knowledge and skills of the target group and evolving understanding. The scientific decisions helped identify the appropriate ways of extending the peer instructors' learning and involving the new ideas in the aquatic fitness programmes.

### 10.1 Product Evaluation

The Aqua Shape programme was performed on 26.10.2015. The study materials and evaluation forms were provided to the peer instructors after a presentation of the product. The most important purpose was to make the high-quality product, which would be satisfied needs and requirements of the peer instructors. Also, the product was evaluated by academic resources concerning product development process and qualitative research method. Based on the academic sources, there were done earlier researches with positive outcomes that helped to critically evaluate the product. The author used critical arguments about own work while evaluating the final product.

One of the Finnish students from Kajaani University of Applied Sciences assisted and provided feedback to the author about the product implementation according to evaluation form. The feedback signified that the researcher had professionalism in aquatic environment, good communication skills, leadership quality, and individual way of teaching. The strength was a demonstration of the programme by using a teaching method 'learn by doing'.

The purpose of the Aqua Shape programme was to benefit the peer instructors. The evaluation form was given for the peer instructors. Half of the peer instructors returned evaluation forms back concerning the product and were satisfied with the overall process. Still there are missing responses from the peer instructors through the lack of social networks.

Based on peer instructors' responses, some of them already want to implement the Aqua Shape programme instead of their previous programmes. The strengths were the following:

clear methodological instructions, exercise modifications, suitable equipment, good rhythm and intensity level. According to the peer instructors' opinions, the Aqua Shape programme includes possible modifications for elderly, so they would not get bored and still they would be able to learn the movements. The lesson was beneficial, because after the session, the peer instructor had minor muscles pain.

The City of Kajaani was satisfied within the programme and an example of the advertisement. In addition, the commissioners and owner of Kaukavesi approved to publish the advertisement on Facebook page, information desk and official website Kaukavesi. Still the peer instructors are studying the Aqua Shape programme, so there are no an exact date of publication.

## 10.2 Ethicality and Reliability

Identifying customer requirements is an integral part in a concept of the product development process (Ulrich & Eppinger 2003, 68). The opinion of the working life was taken into account when the topic and content were approved. The researcher stayed in contact with the working life supervisor during the process.

Reliability and ethical issues bring depth into the research. Ethicality of the thesis is managed by the permission from the commissioners in the City of Kajaani for approval to study the peer instructors. The questionnaire's responses and participant observations are written into field-notes and belong only to the researcher. The professional secrecy is fixed.

The trustworthiness of the product is considered with credibility, reliability, reflexivity and transferability. Credibility means that participants of the research have been described clearly and collected data is evaluated honestly. Credibility can be divided into truth-value, applicable, permanent and neutral. (Kylmä & Juvakka 2007, 128.) To collect the data as honestly as possible the researcher stayed in contact with the supervisor of the working life and the teacher supervisor throughout the process. When the final product was ready, the instruction was performed in Kaukavesi, afterwards the papers were provided to the peer instructors so they could study it. The evaluation form was composed during a week. The last step was to get feedback about the Aqua Shape programme, and to verify whether a content of the papers correspond to the peer instructors' needs and requirements.



Reliability requires researcher to write the research process in a way that other researchers can follow the main points (Kylmä & Juvakka 2007, 129). The author has used references that are from reliable sources. It was necessary to support the knowledge, which has been gained during the process.

Reflexivity requires researcher to evaluate how she impacts her material and research process and she needs to critically observe her own theories and actions. Researcher needs to be self-aware about the research process. The researcher presents reasons for her choices to the readers. (Holloway 1997, 135.) The personal preference has an effect on selection of a suitable programme for older adults in the aquatic exercises, but the researcher also demonstrated that chosen aquatic fitness programme are effective for her target group.

Transferability means that results can be transferred to the other context with certain terms. Researcher needs to provide enough information about research subjects and environment in order for readers to access a transferability of results. (Lincoln & Cuba 1985.) The product development process principally focused on combining two preferred physical activity that gave a result of creating an aquatic fitness programme for elderly people with age-related changes, and therefore it will be transferable to other sports environments. Even through, the clients were peer instructors, the author believes that other specialists can also benefit from the valuable product.

### 10.3 Development of Professional Competences

The main objective of the Degree Programme in Sports and Leisure Management is to ensure the students understand that the degree course is to develop attributes and provide experiences that will enrich them as individuals. The main purpose of the KAMK is to provide students with a high quality, academic yet practical education in the field of sports. The students' professional competence will extend knowledge and critical understanding of the social sciences within the area of sports. The author developed knowledge in exercise physiology, biomechanics, aquatics, human anatomy and management skills.

The Degree Programme in Sports and Leisure Management consists of four various competences, which are health promoting physical activity and coaching, pedagogy and didactics, physical activity, and area of physical exercise involving leadership and enterprise. Consistent with the thesis topic, competence in physical activity refers to the fundamental knowledge and skills required in aquatics with the group of the people who are 65 years old and older.

The knowledge of physical activity was needed when the product was performed. The product included many modifications of water exercises that needed to be selected carefully because of the target group of elderly people. The competence supported to recognize what kind of teaching method should be appropriate for the target group. As a result, the author demonstrated the session in Kaukavesi.

Competence in health promoting physical activity implies to a demonstration of a fundamental knowledge of anatomy and physiology. Knowledge of human anatomy was the most important part of aqua aerobics movements for elderly people. To be aware if the chosen movements influence and which ligaments and joints are stimulated.

The next step is the competence in pedagogy and didactics which includes management of planning, implementing, and evaluating the widespread methods of teaching and ability to utilize learning concept consistent with personal values.

The following competence includes leadership and entrepreneurship. This competence was present during the thesis process. The author showed good leadership qualities and could solve the executive tasks in the field of physical activity, particular in the aquatic environment. The researcher was acquainted with the basic steps of product development process. It helped in creating the high quality programme.

The thesis consists of the product development process and an additional research method. The author knows that all points that she has learned during the thesis process will be beneficial in the future career growth.

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### Questionnaire

1. How long have you been instructing? (Previous experience) Where? What was your target group?
2. Why did you choose to be peer instructor for clients 65+?
3. What are the most important qualities to be good peer instructor? (Own opinion)
4. What kind of programme do you have for this target group? How often do you change structure of aquatics fitness programme?
5. Do you want to implement something new? Some suggestions/wishes?
6. How do participants react to changes in the programme? Do they like it? Is it difficult or easy to adapt for new programme?
7. Could you describe in more details participants? Do they have some problems with health? Diseases?
8. What kind of programme do they like? (Intensive or low intensive)
9. What is your objective (s) in instructing current age group?
10. What are the purposes clients have in aqua aerobics sessions?  
Loosing weight? Maintaining overall health? Integration with peers?  
Or just for fun?
11. Would YOU like that I will create more advanced aqua aerobics programme?

Author: Daria Bunina  
Sport Student of KAMK

Teacher Supervisor: Anne Karhu

31/03/2015

<b>DATE: 16.04.2015</b> <b>Time: 16.00-16.45</b> <b>Duration: 45 minutes</b>	<b>PLACE:</b> <b>Kaukavesi</b>	<b>GROUP: 27 cli-</b> <b>ents</b>
<b>ASSINGMENTS/CONTENT</b> <i>WARM-UP:</i> <ol style="list-style-type: none"> <li>1. Marching</li> <li>2. Knee lift</li> <li>3. Skiing movement</li> <li>4. Swing to the side one leg, then another</li> <li>5. Breaststroke kick to the side (left, right leg)</li> <li>6. Jumping&gt; up one straight leg and touch toes by arm (change)</li> <li>7. Boxing down movements by arms</li> <li>8. Uppercut</li> <li>9. Arms kicking to the sides</li> <li>10. Run</li> <li>11. “KanKan” movements</li> <li>12. Shoulder Rotation (forward and backward)</li> </ol>	<b>EQUIP-</b> <b>MENTS</b>  Without equip- ment Music	<b>TIME</b>  <b>10 min</b>
<i>MAIN PART:</i> <ol style="list-style-type: none"> <li>1. Marching+ push forwards dumbbells</li> <li>2. Knee Lift</li> <li>3. Straight leg forward +opposite arm touch the toes (left, right)</li> <li>4. Straight arms and legs &gt; pull towards each other</li> <li>5. Straight arms &gt; open chest&gt; round back</li> <li>6. “Breaststroke” movement by arms</li> <li>7. Cross arms+ jump (knee pull to the chest)</li> <li>8. Straight arms together slide from one side to another (180 degrees)</li> <li>9. Arms behind back &gt;elbows up and the down</li> <li>10. Keep straight arms to the sides + bend the knee&gt; straighten the knee&gt; kick back&gt; the same movements for another leg</li> <li>11. Arms along the body + up one leg and then another to the sides &gt; for the thigh</li> <li>12. Arms along the body + swing the leg (forward/ backward) &gt; change the leg</li> <li>13. Kick down arms along the body</li> <li>14. Keep arms in front of you + heel touches</li> <li>15. Keep arms in front of you + swing straight leg up (diagonally)&gt; change the leg</li> <li>16. Up on toes&gt; down on heel &gt; swing arms (forward/ backward)</li> <li>17. Pelvis rotation</li> <li>18. Hip up and down (change leg)</li> <li>19. Arms in front + incline forward and keep 3 sec</li> </ol>	Dumbbells (half of the group) Flowers (an- other half) Without Music	<b>25 min</b>

<p>20. Arms in front &gt; incline forward and backward</p> <p>21. Arms along the body (in front) + leg up the side &gt; change the leg</p> <p>22. Arms along sides of the body+ V step (legs)</p> <p>23. Arms along sides of the body + A step (legs)</p> <p>24. Swing one leg up and touch toes by both hands&gt; change the leg</p> <p>25. Squats + both arms kick down along one side if the body&gt; change the side</p> <p>26. Arms keep balance + one leg draw “№8”</p> <p>Change the leg</p> <p>27. -//- Smaller movement &gt;tighten muscles</p> <p>28. Keep and shake both hands in front of you (around 180 degrees)</p> <p>29. Keep feet on the bottom +bend left knee, then right knee&gt; faster and faster</p> <p>30. Ankle rotation</p> <p>31. Jump around 360 degrees</p> <p>32. One arm push forward&gt; another arm bend behind</p> <p>33. Up shoulder (change) &gt; fast</p> <p>34. Up shoulders together &gt; fast</p> <p>35. Biceps curl</p> <p>36. Hands up and incline to one side, then to another</p> <p>37. Hands up and incline forward and back in initial position</p> <p><i>COOL DOWN:</i></p> <ol style="list-style-type: none"> <li>1. Neck stretching</li> <li>2. Cross the arms and try to cross fingers</li> <li>3. Palm Stretching</li> <li>4. Shoulders stretching</li> <li>5. Triceps stretching</li> <li>6. Quadriceps stretching</li> <li>7. Thigh stretching (left heel place on right knee)&gt; change the leg</li> <li>8. Breath in and out</li> <li>9. Stretching the whole body</li> <li>10. Shake the whole body</li> </ol>	<p>Without equipment Without Music</p>	<p><b>10 min</b></p>
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**EXAM**  
*Evaluation form*

Department: Aqua Aerobics programs

Name of the trainee: Bunina Daria

Name of the examiner: Akulina Nadejda

Grade	5	4	3	2	1
1. Selection of exercises					
1.1 Warm-up/stretching		×			
1.2 Main body			×		
1.3 Cool down/stretching		×			
1.4 Load timing/intensity		×			


2. Evaluation of choreography and technique	5	4	3	2	1
2.1 Methodological instructions		×			
2.2 Variety of exercises		×			
2.3 Convenient combination of exercises		×			
2.4 Command (verbal, nonverbal)		×			
2.5 Terminology		×			
2.6 Group management	×				
2.7 Formula SWET		×			

3. Evaluation of the trainer	5	4	3	2	1
3.1 Exercise demonstration		×			
3.2 Appropriate music	×				
3.3 Level of physical activity	×				
3.4 Motivation, enthusiasm, artistry	×				
3.5 Sociability	×				

4. Exercises with equipment	5	4	3	2	1
4.1 Efficiency of used equipment	×				
4.2 Safety of used equipment	×				
4.3 Selection of initial positions		×			




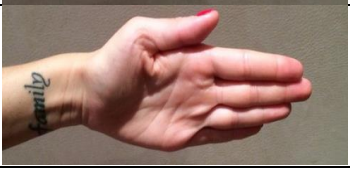
Recommendations: verbal

Examiner: Akulina Nadejda

Signature: 

Lesson	Aqua Shape (intermediate level)
Objectives	Development of the main muscle groups (quadriceps, hamstrings; abductors/adductors of thigh; buttocks; abdominal muscles; muscles of chest, back and arms)
Duration	45 min
Training	Strength training
Equipment	Water belts; swim gloves
Music	124-132 bits/min
Method	Repetition method
Warm-up, Pre-stretching	10-12 min
The main body	30 min
Cool-down, stretching	3-5 min
Intensity	65-75 % from max
Warm-up: Recommended exercises	Running (variations) Arm press in different directions Leg kick in different directions Heel touch Exercise with motion
The main body: Recommended exercises	<i>Instructor should clear explain working muscle groups! Exercising all muscle groups in different order!</i> <u>Front and back muscle of the thigh&gt;exercises:</u> Swing>in different directions; cross country; scissors; heel touches ... <u>Abductor/adductor muscle of the thigh&gt;exercises:</u> Abduction/adduction; scissors; Jumping Jack... <u>Buttocks&gt;exercises:</u> Abduction; scissors; backwards swing... <u>Abs(rectus abdominals; external oblique)&gt;exercises:</u> Curl, crunch, twist, roll, swing... <u>Arms&gt;exercises:</u> Adduction/abduction; forearm extension/flexion; arm flexion/extension; forward/backwards rotation...
Cool-down, stretching: Recommended exercises	Exercises with lower intensity> rocking horse, heel touches... Stretching> the main muscle groups
Repetitions	16-32 rep.*2-3sets
Direction of motion	In different directions
No recommended exercises	All aerobic exercises; short range of motions; fast tempo; exercises with small amplitude

## Wrist position

Name	Methodological instructions	Picture
SLICE	Hands streamline through the water, fingers straight, neutral wrist	
FIST	Hand is fisted with wrist in neutral alignment	
SCOOP/CUP	Hands are used to scoop the water with the surface of the palm	
OPEN/WEB	Fingers spread apart, firm aligned wrist, best with a webbed glove	

## Exercises for Upper body muscles

Name	Description	Methodological instructions	Feedback
SCULLING	<p>Initial position: vertical; arms bend at the elbows; scapulae bring together; shoulders go down; straighten your back</p> <p>√ Arms bend at the elbows</p> <p>√ Arms take place along the torso</p>	<p>→ Sculling is a way to feel that pressure (resistance) or develop a “feel” for the water.</p> <p>→ To move the hands back and forth underwater</p>	<ul style="list-style-type: none"> <li>• To keep vertical position</li> <li>• To do motions at the same time or hand by hand</li> </ul>
PRESS	<p>Initial position: vertical; arms bend at the elbows; scapulae bring together; shoulders down; straighten your back.</p> <p>√ Arms extension at the elbows</p>	<p>→ To press water by opened palm</p> <p>→ To keep straight torso</p> <p>→ To do exercise with force</p>	<ul style="list-style-type: none"> <li>• To use equipment, if you want (e.g. dumbbells)</li> <li>• To press in different directions</li> <li>• Initial positions: verti-</li> </ul>

		→ To breath out during extension	cal/horizontal/on back/on chest/on sides) <ul style="list-style-type: none"> <li>• It is possible to use one arm.</li> </ul>
PUNCH	Initial position: vertical; arms bend at the elbows; shoulders close to torso. <ul style="list-style-type: none"> <li>√ Arm and forearm extension</li> <li>√ To punch forward</li> <li>√ To turn a torso during a punch</li> <li>√ A fist slices along the surface of the water</li> </ul>	→ To do exercise with force → To breath out during a punch	<ul style="list-style-type: none"> <li>• To do punch: diagonally outwards; diagonally down; down</li> </ul>

## Shoulder adduction and abduction

Name	Description	Methodological instructions	Feedback
ADDUCTION (Frontal plane)	Initial position: vertical; arms to the sides; straighten your back; scapulae bring together; shoulders down <ul style="list-style-type: none"> <li>√ To adduct arms in the frontal plane and</li> </ul>	→ Adduction should be done on the exhale → Joints should be slightly bent	It is possible to use one arm.
ABDUCTION (Frontal plane)	Initial position: vertical; arms along the torso; scapulae bring together; shoulders down. <ul style="list-style-type: none"> <li>√ To abduct arms in the frontal plane</li> </ul>	→ Abduction should be done on the exhale → Joints should be slightly bent	It is possible to use one arm.

## Shoulder &amp; forearm flexion and extension

Name	Description	Methodological instructions	Feedback
FOREARM FLEXION (Sagittal plane)	Initial position: vertical; arms along the torso; scapulae bring together; shoulders down. <ul style="list-style-type: none"> <li>√ Forearm flexion &gt; breath out</li> <li>√ To breath in &gt; return to the initial position</li> </ul>	<ul style="list-style-type: none"> <li>→ To focus on flexion movement</li> <li>→ Shoulders keep close to torso</li> <li>→ To keep vertical position</li> <li>→ Joints should be slightly bent</li> </ul>	<ul style="list-style-type: none"> <li>• Alternating movements &gt; both arms</li> <li>• Single movement &gt; one arm</li> <li>• Vertical/horizontal position</li> </ul>
FOREARM EXTENSION (Sagittal plane)	Initial position: vertical; arms along the torso; bent forearms > 90 degrees; shoulders down; scapulae bring together. <ul style="list-style-type: none"> <li>√ Forearm extension &gt; breath out</li> <li>√ To breath in &gt; return to the initial position</li> </ul>	<ul style="list-style-type: none"> <li>→ To focus on extension movement</li> <li>→ Shoulders keep close to torso</li> <li>→ To keep vertical position</li> <li>→ Joints should be slightly bent</li> </ul>	<ul style="list-style-type: none"> <li>• Alternating movements &gt; both arms</li> <li>• Single movement &gt; one arm</li> <li>• Vertical/horizontal position</li> </ul>
ARM FLEXION (Sagittal plane)	Initial position: vertical; arms along the torso; scapulae bring together; shoulders down. <ul style="list-style-type: none"> <li>√ Arm flexion &gt; breath out</li> <li>√ To breath in &gt; return to the initial position</li> </ul>	<ul style="list-style-type: none"> <li>→ To focus on flexion movement</li> <li>→ To keep vertical position</li> <li>→ Joints should be slightly bent</li> </ul>	<ul style="list-style-type: none"> <li>• Alternating movements &gt; both arms</li> <li>• Single movement &gt; one arm</li> <li>• Vertical/horizontal position</li> </ul>



ARM EXTENSION (Sagittal plane)	Initial position: arms push forward; shoulders down; straighten back. <ul style="list-style-type: none"> <li>√ Arms extension (fix arms along the torso)&gt; breath out</li> <li>√ To breath in&gt; return to the initial position</li> </ul>	<ul style="list-style-type: none"> <li>→ To focus on extension movement</li> <li>→ To keep arms in the water</li> <li>→ To bring together scapulae, while breathing out</li> <li>→ To keep vertical position</li> <li>→ Joints should be slightly bent</li> </ul>	<ul style="list-style-type: none"> <li>• Alternating movements&gt; both arms</li> <li>• Single movement&gt; one arm</li> <li>• Vertical/horizontal position</li> </ul>
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## Rotation



Name	Description	Methodological instructions	Feedback
FORWARD ROTATION	Initial position: vertical; arms push to the sides; shoulder down. <ul style="list-style-type: none"> <li>√ To do forward rotation</li> </ul>	<ul style="list-style-type: none"> <li>→ A constant breathing</li> <li>→ To keep own tempo</li> </ul>	<ul style="list-style-type: none"> <li>• Alternating/simultaneous movements&gt; both arms</li> <li>• Single movement&gt; one arm</li> </ul>
BACKWARDS ROTATION	Initial position: vertical; arms push to the sides; shoulder down. <ul style="list-style-type: none"> <li>√ To do backwards rotation</li> </ul>	<ul style="list-style-type: none"> <li>→ A constant breathing</li> <li>→ To keep own tempo</li> </ul>	<ul style="list-style-type: none"> <li>• Alternating/simultaneous movements&gt; both arms</li> <li>• Single movement&gt; one arm</li> </ul>

## Arms movements

Name	Description	Methodological instructions	Feedback
BREAST-STROKE ARMS	Initial position: Arms push forward>arms extension (horizontal plane)>	<ul style="list-style-type: none"> <li>→ To focus on shoulder extension</li> </ul>	<ul style="list-style-type: none"> <li>• Initial positions: vertical/horizontal/on</li> </ul>

	shoulder adduction with forearm flexion (frontal plane)>shoulder and forearm extension (sagittal plane).	<p>sion (horizontal plane)</p> <p>→ To breath out&gt; arm abduction</p> <p>→ To keep vertical position</p>	<p>back/on chest/on sides</p> <ul style="list-style-type: none"> <li>• Keep moving forward</li> </ul>
FREESTYLE ARMS	<p>Initial position: horizontal on the chest.</p> <p>√ To do alternating and rotation movements like in freestyle</p>	<p>→ A constant breathing</p> <p>→ Arms can be straight or bent</p> <p>→ To keep bent elbow while bringing arm above the water</p>	<ul style="list-style-type: none"> <li>• To keep bent elbow while bringing arm above the water&gt;it is the main difference from forward arm rotation</li> </ul>

## Feet position

Name	Description	Methodological instructions	Picture
Foot up	√ To keep foot up	→ An ankle should not feel excessive tension	
Foot down	√ To keep foot down	→ An ankle should not feel excessive tension	

## Knee up

Name	Description	Methodological instructions	Feedback
Knee up	<p>Initial position: vertical; legs keep straight and together.</p> <p>√ Hip and knee flexion&gt; return</p>	<p>→ Hip flexion&gt;breath out</p> <p>→ To keep vertical position</p>	<ul style="list-style-type: none"> <li>• Angle= 90 degrees between hip and torso</li> </ul>

	to the initial position	→ Ankle must have straight line with knee	
Knees up	Initial position: vertical; legs keep straight and together. √ Hips and knees flexion > return to the initial position	→ Hip flexion > breath out → To keep vertical position → Ankle must have straight line with knee	<ul style="list-style-type: none"> <li>• Angle= 90 degrees between hips and torso</li> <li>• Alternating/simultaneous</li> </ul>

## Hip abduction/adduction

Name	Description	Methodological instructions	Feedback
HIP ABDUCTION	Initial position: vertical; legs together. √ To do hip abduction movement > return to the initial position	<ul style="list-style-type: none"> <li>→ To focus on abduction movement</li> <li>→ Hip abduction &gt; breath out</li> <li>→ To abduct no more than 45 degrees</li> <li>→ To keep vertical position</li> </ul>	<ul style="list-style-type: none"> <li>• Single movement &gt; one leg</li> <li>• It can be done in sitting position (horizontal abduction)</li> <li>• It can be alternating movements</li> </ul>
HIP ADDUCTION	Initial position: vertical; abduction > no more than 45 degrees. √ To do adduction hip movement > return to the initial position	<ul style="list-style-type: none"> <li>→ To focus on adduction movement</li> <li>→ To breath out &gt; adduction movement</li> <li>→ To keep vertical position</li> </ul>	<ul style="list-style-type: none"> <li>• Single movement &gt; one leg</li> <li>• It can be done in sitting position (horizontal adduction)</li> <li>• It can be alternating movements</li> </ul>

## Calf flexion/extension

Name	Description	Methodological instructions	Feedback
CALF FLEXION	Initial position: vertical; straight legs down. √ To do flexion calf movement > return to the initial position	→ To focus on flexion → Calf flexion>breath out → Joints should be slightly bent → Foot up → Heel directs to the buttocks	<ul style="list-style-type: none"> <li>• Initial position can be done in sitting position.</li> <li>• A breathing can be constant or have own tempo</li> <li>• Alternating movement</li> </ul>
CALF EXTENSION	Initial position: vertical; bent knee. √ To do extension calf movement > return to the initial position	<ul style="list-style-type: none"> <li>❖ To focus on extension</li> <li>❖ Calf extension&gt;breath out</li> <li>❖ Joints should be slightly bent</li> <li>❖ Foot up</li> <li>❖ Heel directs to the buttocks</li> </ul>	<ul style="list-style-type: none"> <li>• Initial position can be done in sitting position.</li> <li>• A breathing can be constant or have own tempo</li> <li>• Alternating movement</li> </ul>

## Kicks

Name	Description	Methodological instructions	Feedback
KICK FORWARD	√ Initial position: vertical; straight legs down √ Step by step (coherently): hip flexion->calf extension	→ To direct kick forward → Foot up → Kick forward->breath out	<ul style="list-style-type: none"> <li>• Energetic kick</li> </ul>
KICK FORWARD WITH BOTH LEGS	√ Initial position: vertical; straight legs down √ Step by step (coherently): hips flexion->calves extension (simultaneously)	→ To direct kick forward → Feet up → Kick forward->breath out	<ul style="list-style-type: none"> <li>• Energetic kick</li> </ul>

SIDE KICK	<ul style="list-style-type: none"> <li>√ Vertical position</li> <li>√ Coherently or step by step: hip flexion (sagittal plane)-&gt; hip extension (frontal plane)</li> </ul>	→ Side kick->breath out-> torso slightly leans in opposite side	<ul style="list-style-type: none"> <li>• Kick directs to the side</li> <li>• Energetic kick</li> </ul>
KICK BACKWARDS	<ul style="list-style-type: none"> <li>√ Vertical position</li> <li>√ Coherently or step by step: hip flexion (sagittal plane)-&gt; hip extension (sagittal plane)</li> </ul>	→ Side kick->breath out-> torso slightly leans forward	<ul style="list-style-type: none"> <li>• To focus on lumbar spine (without overextension)</li> <li>• Energetic kick</li> </ul>

## Swings

Name	Description	Methodological instructions	Feedback
SWING FORWARD	<ul style="list-style-type: none"> <li>√ Vertical position</li> <li>√ Hip flexion</li> </ul>	<ul style="list-style-type: none"> <li>→ Swing forward-&gt; breath out</li> <li>→ Foot up</li> <li>→ Slightly bent knee</li> <li>→ Between hips -&gt; not less 90 degrees during swing movement</li> </ul>	<ul style="list-style-type: none"> <li>• Maximum amplitude</li> </ul>
SWING BACKWARDS	<ul style="list-style-type: none"> <li>√ Vertical position</li> <li>√ Hip hyperextension</li> </ul>	<ul style="list-style-type: none"> <li>→ Swing backwards-&gt; breath out</li> <li>→ Foot up</li> <li>→ Slightly bent knee</li> <li>→ Swing backwards-&gt; NO more than 20 degrees</li> </ul>	<ul style="list-style-type: none"> <li>• To increase amplitude-&gt;flexing hip no more than 45 degrees</li> </ul>

SWING TO THE SIDE	<ul style="list-style-type: none"> <li>√ Vertical position</li> <li>√ Leg abduction</li> </ul>	<ul style="list-style-type: none"> <li>→ Swing to the side-&gt; breath out</li> <li>→ Foot up</li> <li>→ Slightly bent knee</li> </ul>	<ul style="list-style-type: none"> <li>• Maximum amplitude</li> </ul>
SCISSORS	<p>Two ways:</p> <ul style="list-style-type: none"> <li>√ Flexion/extension-&gt;horizontal/sagittal plane</li> <li>√ Abduction/adduction -&gt; frontal plane</li> </ul>	<ul style="list-style-type: none"> <li>→ The same force movements</li> <li>→ To keep straight legs with slightly bent knees</li> </ul>	<ul style="list-style-type: none"> <li>• Positions: vertical, sitting position, horizontal on the back, on chest, on sides</li> <li>• Sagittal plane: alternating legs movements</li> <li>• Horizontal/frontal plane: simultaneous legs movements</li> </ul>
STRADDLE	<p>Initial position: vertical, legs in the longitudinal split (one leg&gt; forward, another leg &gt;backward)</p> <ul style="list-style-type: none"> <li>√ Simultaneous movement: hip flexion with legs adduction&gt; hip extension with legs abduction</li> <li>√ To switch legs</li> </ul>	<ul style="list-style-type: none"> <li>→ Constant Breathing</li> <li>→ Shoulders are above the water</li> </ul>	<ul style="list-style-type: none"> <li>• Jump imitation -&gt; at one place</li> </ul>
BICYCLE	<ul style="list-style-type: none"> <li>√ Vertical position: simultaneous hip flexion and calf extension (angle 45 degrees)-&gt; hip extension and calf</li> </ul>	<ul style="list-style-type: none"> <li>→ Foot up</li> <li>→ Focus on hip extension</li> <li>→ To keep balance by arms</li> </ul>	<ul style="list-style-type: none"> <li>• The movement can be done by one or both legs alternately</li> <li>• Positions: vertical or horizontal on the side</li> </ul>

	flexion (return to initial position)		
LEGS BREAST-STROKE	Vertical position: hips and calves flexion + hips abduction -> hips and calves extension + hips adduction	Foot up Focus on hips and calves extension and hips adduction In phase 'extension' -> breath out	<ul style="list-style-type: none"> <li>• Positions: vertical, horizontal on the back, on chest, on sides</li> <li>• It is possible to do alternating movements</li> </ul>
LEGS DOLPHIN	Initial position: Vertical position + legs together Simultaneously hips and calves flexion > hips and calves extension	Imitation of 'wave' Feet down Constant breathing	<ul style="list-style-type: none"> <li>• Positions: vertical, horizontal on the back, on chest, on sides</li> </ul>
LEGS FREE-STYLE	Vertical position: alternating hip and calf flexion > hip and calf extension (another leg)	Feet down Constant breathing	<ul style="list-style-type: none"> <li>• Positions: vertical, horizontal on the back, on chest, on sides</li> </ul>
HEEL TOUCHES	Vertical position: alternating calf flexion-extension	Heel directs to the buttocks Constant breathing Slightly bent knee Foot up	—
KICK (slash forward)	Vertical position: hip flexion and calf extension	Foot down energetic movements	it can be done with diagonal movement

## ABS exercises

Name	Description	Methodological instructions	Feedback
CURL	Initial position: on the back; arms to the sides; legs together or cross over, knees bend.	Shoulders, knees, toes -> close to surface Pelvis down Neck is not overextended.	The initial position can be vertical

	Torso flexion - >breath out	Sight is directed forward.	
REVERSE CURL	Initial position: on the back; arms to the sides; legs together or cross over, knees bend. Hips flexion - >breath out	Shoulders, knees, toes ->close to surface Pelvis down Neck is not overextended. Sight is directed forward.	The initial position can be vertical
CRUNCH	Initial position: on the back; arms to the sides; legs together or cross over, knees bend. Simultaneously torso and hips flexion ->breath out	Shoulders, knees, toes ->close to surface Pelvis down Neck is not overextended. Sight is directed forward.	The initial position can be vertical
SIDE ROLL	Sitting position; knees close to torso. Side roll-> breath out	Frontal plane Arms support to keep balance in frontal plane	Initial position: on the side -> must have straight line
BACK ROLL	Sitting position; knees close to torso. Back roll-> breath out	Sagittal plane Arms support to keep balance in horizontal plane	Initial position: on the back -> must have straight line
CHEST ROLL	Sitting position; knees close to torso. Chest roll-> breath out	Sagittal plane Arms support to keep balance in horizontal plane	Initial position: on the chest -> must have straight line
TORSO AND HIPS FLEXION	Initial position: on the back; straight legs; arms to the sides Torso and hips flexion-> pelvis down +breath out	Shoulders, knees, toes ->close to surface Pelvis down Neck is not overextended. Sight is directed forward. Slightly bent knees	Torso and hips close to each other -> as closely as possible

## Special exercises in Aqua Fitness

Name	Description	Methodological instructions	Feedback
WALKING	Vertical position Alternating legs flexion-extension (hip and knee joints)	Low tempo Constant breathing Hip flexion-> until 90 degrees	In different directions
JOGGING	Vertical position	Constant breathing Hip flexion-> more than 90 degrees	In different directions



	Alternating legs flexion-extension (hip joints)		
CROSS COUNTRY	Vertical position; legs in forward split (forward leg is bent (obtuse angle); back leg is straight Arms close to the surface (one arm-forward; another arm-backward) Alternating hips flexion-extension and shoulders flexion-extension ->sagittal plane Arms and legs are opposite.	Constant breathing Feet up Slightly bent knees	Can be done with straight legs
JUMPING JACK	Vertical position; legs together; arms to the sides Frontal plane Simultaneously legs abduction and arms adduction-> legs adduction and arms abduction	Arms adduction->breath out Arms abduction->breath in	Opposite arms and legs
JUMPING	Simultaneously legs flexion-extension (hip and knee joints)	Initial position, breathing, arms movement, rhythm might be different and depend on aim of the exercises.	In different directions
ROCKING HORSE	Vertical position; bent knees in forward split Torso leans forward/backward at one place	Arms intensively keep balance Constant breathing	<hr/>
TWIST	Vertical position Upper body rotation in one direction Lower body rotation in another direction	Straight back Constant breathing	<hr/>
HEEL TOUCH FRONT/BACK	Vertical position; legs and arms to the sides	To keep vertical position Constant breathing	Can be done without touches

	Right hand touches the left leg in front and behind		
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**Kaukavesi**  
VESILIIKUNTAKESKUS KAJAANI

**SYKSY  
2015**

**UUSI VESIAEROBIC  
TUNTI OHJAAJIEN KANSSA**

**65+**

**YHTEISTYÖSSÄ**

 **KAJAANI**  **KAJAANIN  
AMMATTIKORKEAKOULU**  
UNIVERSITY OF APPLIED SCIENCES



*Observation form*Date: 26.10.2015Location: KaukavesiInstructor: Bunina DariaObserver: Jasmiina Savolainen

Grade	5	4	3	2	1
1. Selection of exercises					
1.1 Warm-up/stretching					
1.2 Main body					
1.3 Cool down/stretching					
1.4 Load timing/intensity					
2. Evaluation of choreography and technique					
2.1 Methodological instructions					
2.2 Variety of exercises					
2.3 Convenient combination of exercises					
2.4 Command (verbal, nonverbal)					
2.5 Terminology					
2.6 Group management					
2.7 Formula SWET					
3. Evaluation of the trainer					
3.1 Exercise demonstration					
3.2 Appropriate music					
3.3 Level of physical activity					
3.4 Motivation, enthusiasm, artistry					
3.5 Sociability					
4. Exercises with equipment					
4.1 Efficiency of used equipment					
4.2 Safety of used equipment					
4.3 Selection of initial positions					

Observer: \_\_\_\_\_

Signature: \_\_\_\_\_

### Programme Evaluation Form

Date: \_\_\_\_\_

Session: \_\_\_\_\_

Please respond to the following questions by circling the number and by writing the response that best describes how you feel about the program. Your comments will help author improve the quality of Water Aerobics Program and will be kept confidential.

1. How do you feel about today's session?

Very Good	Good	So-So	Bad	Very Bad
5	4	3	2	1

2. How do you feel about the programme so far?

Very Good	Good	So-So	Bad	Very Bad
5	4	3	2	1

3. What do you like about today's session?

- a)
- b)
- c)

4. What did not you like about today's session?

- a)
- b)
- c)

5. What changes would you make in today's session?

- a)
- b)
- c)

Other comments: