

Ice Skating School Students with Disabilities in Hearing Computer Aided Investigation of Basic Training Motor in Properties

Ahmet ŞİRİNKAN

Department of Recreation College of Physical Education and Sport, Atatürk University, Turkey
asirinkan@hotmail.com

Abstract: The purpose of this study was to apply ice skating training to primary school students with hearing impaired through a computer aided way and to examine the effects of this application. 22 students as control group and 20 students as experimental group from Erzurum Dede Korkut Primary School for children with hearing impaired participated in this study. Experimental group was comprised of 7 female and 13 male students and their ages were between 10-15. Control group was comprised of 8 female and 14 male students. Studies and researches were carried out twice a week, each day comprising of 60-90 minutes and lasted 3 months (12 weeks). Basic techniques of ice skating training (basic position, approaching, V position and skating, a lemon movement, half lemon, turns in clockwise and counter-clockwise, cross steps, positions, snow plow, keen edge, backsliding, back cross-over) were taught to primary school students with hearing impaired. Power-point, video presentation and slide images were used in training of students in experimental group. No digital material was used in training of students in control group. Records were made by applying prepared observation forms and EUROFIT tests in the first and last week of training. Statistical methods such as frequency (f), percentage (%), average (X), standard deviation (SS) and t test were applied in analysis of data by using SSPS 16.00 package program. At the end of research, whereas significant progress ($p>0.05$ percentage) of ice skating basic techniques such as basic position, approaching, V position and skating, a lemon movement, half lemon, turns in clockwise and counter-clockwise, cross steps, positions, snow plow, keen edge, backsliding, back cross-over was observed in experimental group, no significant progress in learning of these techniques was observed in control group. No progress findings were obtained in hand grip strength, leg and back strength.

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Key Word: Defined, Ice Skating, Eurofit Tests, Observation Form

1. Introduction

As it is known, sport is a necessary activity for a healthy and happy life and it is important for all people. But it holds a different place for disabled people. Because sport provide a new perspective for disabled people who already encounter many obstacles in life and live with the stress caused by these obstacles. Doing exercises, participating in sportive activities give happiness to individual, this pleasure is an important means in meeting the needs of recreation and success and it also increases motivation in life whatever disability type and its level are. The individual can share his loneliness with other people, make friends, learn how to cooperate, have the opportunity of improvement and progress by recognizing his own skills and develop positive feelings towards himself, his body and other people by doing sport, as well as its positive contributions to health. All of these factors provide the individual with opportunity of having and living meaningful and satisfying life.

Disabled individuals can even complete training process of competitive sports organized for specific aims, participate in competitions and be

successful or fail. In this context, they consider themselves as athletes rather than disabled. With confidence given by this feeling, individuals can learn how to cope with obstacles (www.rehabilitasyon.com, 2012). Physical education and sport activities are used as a therapy method in training and rehabilitation of the disabled in today's world. Positive effects of sports performed by the disabled individual reflect on himself, his family, his working environment and society directly. Sport for the disabled means the increase of communication, the progress of initiative and integration between individuals. Planned training and exercise draw attention as a factor that increases joy of life, develop their self-confidence as well as improving their health status (Gür, 2001). Sport is one of the best ways in integration of the disabled into society. Today, the disabled have opportunities of doing sport in different branches according to the status and level of disability. The most common sports branch are volleyball, football, table tennis, judo and wrestling among hearing impaired. These sports branches help the hearing impaired to acquire confidence, balance, muscle control, freedom of movements, coordination and evaluate their leisure

times (Maggill, 1980). Children with hearing impaired in disability groups are no different from children with no hearing impaired in terms of physical fitness. In performance, differences have been observed because of age and gender (Özer, 2001). Levels of hearing loss can vary between individuals. Everyone should be careful while making a decision about the preference of the most suitable way to communicate with individuals. First of all, the communication preference of the individual should be determined. Only 30 % of the hearing impaired communicates with lip reading. With this aim, only after learning necessary lip reading information to communicate with people in a lip reading way, can it be possible to communicate with them. Some people prefer to communicate with speaking or paper and pencil apart from communication with lip reading. While speaking with a hearing impaired, chewing gum or writing a text message, the individual pays his whole attention to mouth. Some people may restrict their speaking skills. They may ask again and again in a polite way to understand what the person says (Robertson, Long, 2008). There are four factors that affect social and emotional progress of hearing impaired student. First of all, family-child interaction plays an important role in development of every child. Secondly, the student's friends of the same age and teachers play an important role in his social progress. Third factor is awareness of being social. Lastly, hearing impaired student may feel themselves isolated and alone as they cannot communicate with other students easily. Only hearing loss does not determine social and emotional development of the individual. Behaviors of people without hearing loss can be determiner on this issue. Negative attitudes of these people can even lead to irreparable or nonrecoverable negativeness in behaviors of hearing impaired people (Turnbull et al, 2007).

Playing games enables hearing impaired children to develop communication skills, express themselves and it also enables mothers and fathers to know their children better. It also gives the opportunity to children to recognize their own skills and characteristics (NDSC (National Deaf Children's Society, 2004). It is emphasized that physical education activities for hearing impaired are important as these activities enable trainers to adapt physical education activities in a different way, to develop communication skills and they contribute to sign language of children (Reich et al, 2009). The most important stage of sportive activities for hearing impaired is visual aid. In this stage, the required performances can be presented by score boards, pictures and light signals. This makes hearing impaired students give more attention. Visual stories can be formed by representing each stage of the required behavior with pictures. In this stage, symbols

have an important role. Story series prepared with adaptation by using symbols which are familiar or easy to recognize for children get more attention (Rouse, 2009). Sports opportunities for hearing impaired students are school and society sport programs. The most important roles of physical educators and coaches for these programs are to encourage hearing impaired students and his friend of the same age and to introduce suitable sports branches for them. With this aim, American Athletic Association for the Deaf (AAAD) was established in Ohio State of America in 1945. People with mild or high intensity hearing loss (55 Db or more hearing loss) participate in competitions under the name of USADSF (USA Deaf Sports Fed).

Sports branches organized by USADSF for males and females are badminton, baseball, basketball, bowling, curling, bicycle, golf, hockey, martial arts, orienteering, shooting, skiing and snowboarding, football, swimming, tennis, table tennis, handball, athletics, triathlon, volleyball, water polo and wrestling competitions (Winnick, 2011). Sportive activities continued under the name of Federation of Disability Sport until 2000 in our country. But since 2000, federations have been organizing competitions under the names of visually impaired sports federation, mentally impaired sports federation, orthopedic disability federation and hearing impaired sports federation. Hearing Impaired Sports Federation are active in branches of football, basketball, volleyball, handball, table tennis, chess, wrestling, skiing, swimming, athletics, bowling, badminton, folk dances and tennis. Regional climate conditions and sports fields for ice sports in Erzurum and primary School and vocational high school for children with hearing impaired in our city have been inspiration for our study

Instruments

Evaluation of digital balance and static

(kinesthetic) balance:

KBE 3000, Kinesthetic Ability Trainer 3000 (Med-Fit Systems Inc., Fallbrook, C.A., USA) balance platform was used. Static balance test was performed while person was bipede station on balance platform. During the test, he was required to hold the red cross symbolizing the center of platform that is on screen for 30 seconds. After 1 minute practice, 3 successive tests were carried out. During tests, arms were tied in a crossed way on chest and knees were held in a 10 degree flexion. The best of balance index obtained from three tests, namely the one that has the lowest score, was evaluated.

Flexibility test instrument:

Standard sit-reach test tests maximum flexibility level that the back can reach without much strain on back muscle. The flexibility of back muscles shows the work and movement performance that back

can perform. Flexibility test is a very true and valid method to measure back flexibility. This method replaces raw measurement instruments explained by Wells / Dillon and Johnson / Nelson. Sport trestle was made of durable and light aluminum. Scale on the trestle reaches 23" with ½" inch increases and 59 cm as centimeter. In the test, the person tries to push the sliding bar with his hands at maximum level while his feet are upright and he is sitting in a leaning position upon panel.

Leg dynamometer, Isometric Leg Strength Test

It is used to measure leg strength. Before starting, the device should be restarted. The person stands on the dynamometer in a standing position and his feet should be in the same line with his shoulders. Chain should be arranged in a way so that knees will be about 110 degree. In this position, the back should be a little bent towards hips. Head should be in an upward position and he should look forward. It is required that the chain is pulled as strongly as possible without bending the back.

Abalakow Vertical Jump Test:

Sportsman wears a belt and steps up on rubber plate on the ground, rope is disengaged in meter that is located in jump belt worn by sportsman and counter is reset. Test is explained to the sportsman and he warms up. After 2- 3 pretesting, he bends his knees and moves downwards to gain speed. He does not throw his own body forward or back, goes down the place that he jumps from in a balanced way. He jumps three times and the best jump score is taken into account.

Camera:

Studies were recorded with memory card compatible, LCD dimension 3, proportional zoom HDR-PJ10 digital camera and optic camera.

Power-point LG HW300G LED Projector:

This portable 13 inch Macbook Pro laptop now has features such as 24GHz Intel Core i5 and 2,8 GHz Intel Core i7 that is the fastest binuclear processor. These processors can reach 3,4 GHz speed thanks to its Turbo Boost feature and it enables Macbook Pro to show double fast performance compared to its previous models.

Materials and Methods

22 students as control group and 20 students as experimental group from Erzurum Dede Korkut Primary School for children with hearing impaired participated in this study. Experimental group was comprised of 7 female and 13 male students and their ages were between 10-15. Control group was comprised of 8 female and 14 male students. Studies and researches were carried out twice a week, each day comprising of 60-90 minutes and lasted 3 months (12 weeks). Basic techniques of ice skating training (basic position, approaching, V position and skating, a lemon movement, half lemon, turns in clockwise

and counter-clockwise, cross steps, positions, snow plow, keen edge, backsliding, back cross-over) were taught to primary school students with hearing impaired. Power-point, video presentation and slide images were used in training of students in experimental group that is related to basic techniques. No digital material was used in training of students in control group. Observation form was prepared with aim of monitoring development of children for study.

Basic motoric characteristics of children were analyzed through EUROFIT tests. Records were made by applying prepared observation forms and EUROFIT tests in the first week of training. Their development was also monitored by applying same observation forms and EUROFIT tests in the last week of training. Data related to research was tabulated after being analyzed.

Data Analysis

Statistical methods such as frequency (f), percentage (%), average (X), standard deviation (SS) and t test were applied in analysis of data by using SPSS 16.00 package program. Distribution of age, class, height and weight of experimental and control group subjects in the study was determined. Before the study, significance levels were determined by comparing data related to pre- test and post- test which were applied to experimental and control group.

When table 1 is analyzed, it is conferred that subjects in experimental group in the study are comprised of 13 males (65 %) and 7 females (35 %). One of these students is 10 years old (5 %), 3 of them are 11 (% 10), 8 students of them are 12 years old (40 %), 4 of them are 13 years old (20%), 3 of them are 14 (15%) and 3 of them are 15 years old (10%). 2 students of experimental group (%10) study 2nd class, there are 3 students (15%) in 3rd class, 6 students (30%) in 5th class, 1 student (5%) in 6th class, 1 student (5%) in 7th class and 1 student (5%) in 8th class in experimental group. The height of students in experimental group ranges between 128 cm and 163 cm and there are differences of 2, 3, 4 cm between the students. The weight of the students ranges between 29 and 58 kilogram and there are differences of 2, 3, 4 kilogram between the students. When table 1 is analyzed, it is conferred that subjects in control group in the study are comprised of 14 males (70 %) and 8 females (30 %). One of these students in control group is 10 years old (5 %), 2 of them are 11 (% 10), 7 students of them are 12 years old (35 %), 5 of them are 13 years old (25%), 3 of them are 14 (15%) and 4 of them are 15 years old (20%). 3 students of control group (%15) study 2nd class, there are 3 students (15%) in 3rd class, 5 students (25%) in 4th class, 7 student (35%) in 5th class, 1 student (5%) in 6th class and 1 student (5%) in 7th class and 2 students in 8th class in control group. The height of students in

experimental group ranges between 128 cm and 163 cm and there are differences of 2, 3, 4 cm between the students. The weight of the students ranges between

30 and 60 kilogram and there are differences of 2, 3, 4 and 5 kilogram between the students.

Results

Table1: Status of Age, Gender, Height and Weight of Experimental and Control Group

AGE	STATUS		N		%	
	EXPERIMENTA L	CONTRO L	EXPERIMENTA L	CONTRO L	EXPERIMENTA L	CONTRO L
	10	10	1	1	5,0	5,0
	11	11	2	2	10	10
	12	12	8	7	40	35
	13	13	4	5	20	25
	14	14	3	3	15	15
	15	15	2	4	10	20
CLASS	2	2	2	3	10	15
	3	3	3	3	15	15
	4	4	6	5	30	25
	5	5	6	7	30	35
	6	6	1	1	5,0	5,0
	7	7	1	1	5,0	5,0
	8	8	1	2	5,0	10
GENDE R	Male	Male	13	14	65	70
	Female	Female	7	8	35	30
HEIGHT	128 cm	128 cm	2	2	10	10
	130 cm	130 cm	1	1	5,0	5,0
	132 cm	132 cm	2	2	10	10
	135 cm	136 cm	1	1	5,0	5,0
	138 cm	138 cm	2	2	10	10
	140 cm	142 cm	2	2	10	10
	142 cm	143 cm	1	1	5,0	5,0
	145 cm	146 cm	2	2	10	10
	147 cm	148 cm	1	1	5,0	5,0
	151 cm	152 cm	1	1	5,0	5,0
	154 cm	155 cm	2	2	10	10
	157 cm	157 cm	1	1	5,0	5,0
	160 cm	160 cm	1	1	5,0	5,0
	163 cm	163 cm	1	1	5,0	5,0
	WEIGH T	29 kilo	30 kilo	2	2	10
30 kilo		30 kilo	2	2	10	10
31 kilo		31 kilo	2	2	10	10
33 kilo		34 kilo	1	1	5,0	5,0
35 kilo		35 kilo	2	1	5,0	5,0
38 kilo		38 kilo	1	1	5,0	5,0
42 kilo		43 kilo	2	2	10	10
45 kilo		46 kilo	3	3	15	15
48 kilo		50 kilo	1	1	5,0	5,0
50 kilo		52 kilo	2	2	10	10
53 kilo		55 kilo	1	1	5,0	5,0
58 kilo		60 kilo	1	1	5,0	5,0

Table 2: Status of Age, Gender, Height and Weight of Experimental Group

Tests	N	Min.	Max.	Mean	Std. Dev.	Z
Static balance pre	20	99	856	2,624	215,744	-3,921
Static balance post	20	87	765	2,386	196,128	,000*
Dynamic balance clockwise pre	20	996	3230	2,180	574,938	-3,920
Dynamic balance clockwise post	20	990	3210	2,042	574,522	,000*
Dynamic balance counter clockwise pre	20	1027	2948	2,239	528,739	-3,024
Dynamic balance counter clockwise post	20	1012	2765	1,740	495,720	,000*
Vertical jump	20	24	40	32,650	4,749	-3,940
Vertical jump	20	30	45	36,550	4,501	,000*
Flexibility pre	20	1	9,40	4,440	2,789	-3,929
Flexibility post	20	2	13,40	6,525	3,207	,000*
Leg strength pre	20	24	84	49,950	20,661	-3,925
Leg strength post	20	33	95	58,400	21,639	,000*

When table 2 is analyzed, findings of improvement/progress differences between values of static balance pre- test and post- test ($Z=-3,921$, $p>0,000$), between values of clockwise dynamic balance pre- test and post- test ($Z=-3,920$, $p>0,000$), between values of counter clockwise dynamic balance pre- test and post ($Z=-3,024$, $p>0,000$), between values of

vertical jump test pre- test and post- test ($Z=-3,940$, $p>0,000$), between values of flexibility test pre- test and post- test ($Z=-3,929$, $P>0,000$), between values of leg strength pre -test – post- test ($Z=-3,926$, $p>0,000$) of students in experimental group have been observed.

Table 3: Status of Age, Gender, Height and Weight of Control Group

TESTS	N	MINIMUM	MAXIMUM	MEAN	STD. DEV.	Z
Static balance pre	22	98	754	2,499	176,621	-,037
Static balance post	22	102	752	2,447	177,775	,970
Dynamic balance clockwise pre	22	1012	3300	2,095	593,147	-,093
Dynamic balance clockwise post	22	1043	3345	2,133	605,791	,926
Dynamic balance counter clockwise pre	22	1234	2900	2,298	499,495	-3,119
Dynamic balance counter clockwise post	22	1221	2865	2,165	553,642	,002*
Vertical jump	22	28	42	33,250	3,739	-,827
Vertical jump	22	27	40	33,000	3,145	,408
Flexibility pre	22	2	8,50	4,946	1,883	-,726
Flexibility post	22	2	8,00	4,870	1,794	,468
Leg strength pre	22	32	78	52,950	17,111	-,094
Leg strength post	22	32	80	52,650	16,671	,925

When table 3 is analyzed, no findings of improvement/progress differences between values of static balance pre-test and post-test ($Z=-.037$, $p>,970$), between values of clockwise dynamic balance pre-test and post-test ($Z=-,093$, $p>,926$) of students in control group have been observed. While from research data, progress has been observed between values of counter clockwise dynamic balance pre-test

and post ($Z=-3,119$, $p>0,002$), no findings of progress have been observed between values of vertical jump test pre-test and post-test ($Z=-3-,827$, $p>,408$), between values of flexibility test pre-test and post-test ($Z=-,726$, $P>,468$), between values of leg strength pre-test – post-test ($Z=-,094$, $p>,925$) of students in experimental group.

Table 4: Status of Data Obtained from Observation Form

Basic Movements	Experimental Group pre test	%	Experimental Group post test	%	Control Group pre test	%	Control Group post test	%
Walking	20	100	20	100	22	100	22	100
Successful	3	15	18	90	2	9	3	13,6
Unsuccessful	17	85	2	10	20	91	17	86,4
Pacing	20	100	20	100	22	100	22	100
Successful	4	20	19	95	2	9	4	18,1
Unsuccessful	16	80	1	5	20	91	18	81,9
Running	20	100	20	100	22	100	22	100
Successful	1	5	19	95	2	9	3	13,6
Unsuccessful	19	95	1	5	20	91	19	86,4
Hopping/leap	20	100	20	100	22	100	22	100
Successful	1	5	20	100	2	9	2	9
Unsuccessful	19	95	-	-	20	91	20	91
Taking steps	20	100	20	100	22	100	22	100
Successful	8	40	20	100	8	36,3	10	45,4
Unsuccessful	12	60	-	-	14	63,7	12	54,6
Jump	20	100	20	100	22	100	22	100
Successful	-	-	18	90	-	-	1	4,5
Unsuccessful	20	100	2	10	22	100	21	95,5
Skating by taking steps	20	100	20	100	22	100	22	100
Successful	-	-	19	95	-	-	1	4,5
Unsuccessful	20	100	1	5	22	100	21	95,5
Bending knees	20	100	20	100	22	100	22	100
Successful	4	20	20	100	2	9	3	13,6
Unsuccessful	16	80	-	-	20	91	19	86,4
Leaning forward from knee	20	100	20	100	22	100	22	100
Successful	-	-	18	90	-	-	-	-
Unsuccessful	20	100	2	10	22	100	22	100
Looking forward	20	100	20	100	22	100	22	100
Successful	5	25	20	100	4	18,1	4	18,1
Unsuccessful	15	75	-	-	18	81,9	18	81,9

In table 4, it has been observed from data obtained with observation form that students in control group are unsuccessful in basic techniques ($p>0,001$). It has been observed that students in control group have been unsuccessful in techniques of walking with rollerblade in both pretest (91%) and post-test (86,4%) results. It has been observed that control group has failed in stepping (in both results of pre-test (91%) and post-tests (81,9%)) and running technique (in both results of pre-test (91%) and post-tests (86,4%)). Findings have been found about the failure of control group in leap/hopping technique in both results of pre (91%) and post-tests (91%), in taking steps technique in both results of pre (63,7%) and post-tests (54,6%), in jump technique in both results of pre (100%) and post-tests (95,5%). It has been observed that control group has not been good at

skating by taking steps technique in both results of pre (100%) and post-tests (95,5%), at bending knees technique in both results of pre (91%) and post-tests (86,4%), at leaning forward from knees technique in both results of pre (100%) and post-tests (100%), at looking forward in both results of pre (81,9%) and post-tests (81,9%). It has been observed in data obtained with observation form in chart 4 that students in experimental group have been good at basic techniques ($p>0,001$). It has been observed that experimental group has been successful in walking with rollerblade technique in the results of pretest (15%) and this success has increased in the results of post-tests (86,4%), and they have also been good at stepping technique in both results of pre (20%) and post-tests (95%). Success of experimental group in walking technique has been 5% in the results of pre-

test, they have also been successful 95 % in the results of post-test, while their success in hopping/leap technique has been 5% in pre-test results, and this success rate has increased to 100 % in post test results. Experimental group has been good at in taking steps (40 %) in pre-test results and also (95 %) in post test results. Despite their (100 %) failure in jump in pre-test results, their success has increased with a 90% percentage in post test results. Although they have been unsuccessful (100 %) in skating by taking steps in pre-test results, this success percentage has been increased excessively (90 %) in post test results.

Success of experimental group in bending knees technique has been low with a 20 % percentage in pretest results, their success has been on increase (90%) in posttest results, it has been observed that whereas failure rate has been on high level (100 %), their success has increased (90 %) in post test results, their success in looking forward technique has increased from 25 % in pretest results to 100% posttest results.

Discussion and Conclusion

Findings of progress with a $p > 0,001$ percentage has been obtained from application of teaching method program of basic techniques related to ice skating (walking with rollerblade, stepping, running, leap, taking steps, jump, skating by taking steps, bending knees, leaning forward from knee, looking forward) which have been applied to experimental group in the research and from pretest and posttest data of measurement of static balance, clockwise dynamic balance, counter clockwise dynamic balance, vertical jump, flexibility and leg strength. While progress has been observed in only measurement of counter clockwise dynamic balance between pre- test and post test data of students in control group, no findings of progress have been found in other measurement (static balance, clockwise dynamic balance, vertical jump, flexibility and leg strength). In results of observation carried out by two different academicians, no progress has been observed in the techniques of walking with rollerblade, stepping, running, leap, taking steps, jump, skating by taking steps, bending knees, leaning forward from knee, looking forward between pre observation and post observation results of control group.

High level of progress (90-100 %) has been observed in walking with rollerblade, stepping, running, leap, taking steps, jump, skating by taking steps, bending knees, leaning forward from knee, looking forward from basic techniques of ice skating in the results of pre observation and post observation results of experimental group. Findings of physical development of students have been obtained in the

studies about hearing impaired. Positive progress has been observed in balance, coordination, flexibility problems of hearing impaired by means of special movement training program. Ciğerci et al (2011) have concluded in his study that participation of hearing impaired individuals in sportive activities make their strength, flexibility, anaerobic strength and speed values better than individuals without any disability or close to theirs. Flexibility progress in this study shows parallelism with our study. Savucu has argued in his study that (2009), children with vestibular damage have not been categorized in a different group with other children with hearing loss. As a result, positive progress has been observed in some sportive activities (running, hitting, and leap) between hearing impaired children. Yılmaz and his friend have observed positive progress of static balance of hearing impaired children who do sports regularly in their studies (2007). The importance of exercise has appeared again in terms of eliminating balance problems that are the biggest problem of hearing impaired. Maggill (1980) and O'Conne (2000) have reached to the conclusion that participation of hearing impaired individuals in sportive activities help them to gain confidence, balance, muscle control, freedom in movements and coordination. It has been emphasized that it contributes to free movement of individuals and elimination of worry that they will be harmed. Canales and Lytle (2001) has told that exercises such as lifting and putting down feet, standing on one foot, trying to maintain balance with arms contributes to balance and flexibility development of children. In our study, exercises such as skating on one foot with rollerblade, skating by taking steps, hopping/leap are signs of their contribution to balance and flexibility development of children.

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