The Project of Involving Young People With Spinal Cord Paralysis into Social Life Using Virtual Reality

The Needs of Young People With Spinal Cord Paralysis Field Research Report

VR 4 Inclusion

BAU
BAHÇEŞEHİR ÜNİVERSİTESİ

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Kalkınma ve İnovasyon Ofisi

POLITECHNIKA
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ΝΟΜΑΡΧΙΑΚΟ ΑΘΛΗΤΙΚΟ ΣΩΜΑΤΕΙΟ
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B. ABBREVIATIONS

- EU: European Union
- ABS Amniotic Band Syndrome
- ALS: Amyotrophic Lateral Sclerosis
- ANED: The Academic Network of European Disability Experts
- BAU: Bahçeşehir University
- CRPD: Convention of the Rights of Persons with Disabilities (CRPD)
- ADP: Administration of Disabled People
- FYDP: Five Year Development Plans
- CORDIS: The Community Research and Development Information Service
- PPSEDP: Public Personnel Selection Examination for Disabled People
- ICT: Information and. Communication Technology
- İŞKUR: Turkish Employment Agency
- KIO: Development and Innovation. Office
- NGO: Non-Governmental Organization
- O2: Virtual Reality Implementations
- O3: Social Inclusion Education Program
- TM: Project Planning Meeting
- SCI: Spinal Cord Injury
- SUT: Silesian University of Technology
- T.C.: Republic of Turkey
- UOFD: International Paraplegic Youth Association
- UN: United Nations
- VR: Virtual Reality
- CoHE: Council of Higher Education
- WHO: World Health Organization

C. DIRECTOR'S SUMMARY

With five partners from Turkey, Poland and Greece the aim of the Project is focused on supporting the adaptation to social life of the youth who have subjected to spinal cord injury due to various. Firstly, for this purpose, a research was done on the needs of these individuals, their difficulties in adapting to social life. The research resulted in identifying various obstacles that prevent persons with disabilities from participating in education or workforce, economic problems, transportation and logistical setbacks for when they step outside as well as lack of facilities and materials to perform physical activities. In addition to the mentioned obstacles, it has been observed that these individuals are willing to participate in social life and engage in physical activities, but aside from their physical disabilities they also have psychological traumas.

The solutions produced within the scope of the project, is not about the disabilities but finding ways for persons with disabilities who have withdrawn from the society to have self-confidence and ways to express themselves better against the prejudices of the society.

In order to overcome these obstacles and to include these individuals into life Virtual Technologies have been the starting point of this project to create a feeling of being a stronger participant through the mental imagery and a safer starting point instead of the troubles that may occur during day-to-day life. An experience acquired in a virtual environment also affects real life. At the same time, virtual reality provides many benefits to individuals in terms of time, cost and usefulness.

Three virtual reality games have been produced about boccia, hockey and cycling; three sports that persons with disabilities can participate in. Sports have had a rehabilitative aspect on persons with disabilities and to help encourage persons with disabilities in physical activity the games have been based around sports.

The encouraging results of the research are important and can be set as examples to EU countries, strategy makers and public institutions, while serving as a reference for many studies, and also to provide guidance to the targeted audience to raise awareness.

D.WHAT IS DISABILITY?

According to the United Nations persons with disabilities have been defined as "including people with long-term physical, mental, intellectual or perceptual impairments that prevent their full and effective participation in society under equal conditions with other individuals."

In Turkey, according to the law no 5378 for persons with disabilities which took effect in 2005 persons with disabilities have been defined as; "Individual who is affected by attitudes and environmental conditions that limit their full and effective participation in society under equal conditions with other individuals due to their various physical, mental, spiritual and sensory abilities" (Law for Persons with Disabilities, m.3).

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1.Types of Disabilities

Types of disabilities have been classified and accepted on 2001 by the World Health Organization (WHO) under the framework International Classification of Functioning (ICF). According to aforementioned framework disabilities have eight subgenres:

- Mobility and Physical Impairments
- Spinal Cord Injuries
- Head Injuries and Brain Disability
- Vision Disability
- Hearing Disability
- Cognitive and Learning Disabilities
- Psychological Disorders
- Invisible Disabilities

In our country disabilities have been classified into six subgenres according a 2002 research regarding Persons with Disabilities in Turkey done by Republic of Turkey Administration of Disabled People.

Orthopedic Impairment: Person who has insufficiency, deficiency and loss of function in the musculoskeletal system. Those with shortness, deficiency, excess, absence, limitation of movement, deformity, muscle weakness, bone disease, paralysis, cerebral palsy, spastics and spinabifida in the hands, arms, feet, legs, fingers and spine.

Visually Impaired: A person who has complete or partial vision loss or impairment in one or both eyes. Those who use eye prosthesis and color blindness and night blindness with visual loss fall into this group.

Hearing Impaired: A person with full or partial hearing loss in one or both ears. Those who use hearing aids are also included in this group.

Language and Speech Impaired: A person who cannot speak for any reason or who has impaired speech, fluency, expression, and voice impairment for any reason. Those who are unable to speak even though they hear, who are thrown, who use tools to speak, those who have stuttering, aphasia, tongue-lip-palate-jaw structure are included in this group.

Mentally Disabled: A person with various degrees of mental disability. Those with mental retardation (mental retardation), down syndrome, phenylketonuria (if they cause mental retardation) fall into this group.

Chronic Disease: Diseases that require constant care and treatment that cause the work capacity and functions of the person to be impaired (Blood diseases, cardiovascular disease).

2. Access to Civil Rights for Persons with Disabilities

Convention of the Rights of Persons with Disabilities (CRPD) counts the following basic principles as a starting point for full and equal access to all human rights of persons with disabilities;

1. Respect for inherent dignity, individual autonomy including the freedom to make one's own choices, and independence of persons
2. Non-discrimination
3. Full and effective participation and inclusion in society
4. Respect for difference and acceptance of persons with disabilities as part of human diversity and humanity
5. Equality of opportunity
6. Accessibility
7. Equality between men and women
8. Respect for the evolving capacities of children with disabilities and respect for the right of children with disabilities to preserve their identities

3. General Statement on the Status of Persons with Disabilities in Turkey and the EU

3.1. General Statement Regarding Persons with Disabilities in Turkey

According to OECD and Turkey's data, about 15% of the world population is composed of persons with disabilities which means there is 1 billion disabled people in the world. Therefore, they are described as the "largest minority" in the world. In Turkey, according to the National Persons with Disabilities Database the number of persons with disabilities are 1,559,222. (However, according to unofficial figures its approximately 13% which makes up about 9 million people) Out of this number; 27% of them are between 0-21 years old, 36% between 22-49 years old and 37% between 50-64 years old. With age, the rate of persons with disabilities increase: In OECD countries, the proportion of people with disabilities aged 20-34 is 6%. This rate doubles between the ages of 35-49. It reaches 24% between the ages of 50-64 +. According to Turkish Statistical Institute, the rate of persons with disabilities who withdraw after primary school is 60%, while this figure is 25% in EU countries. The rate of people with disabilities at risk of social exclusion and poverty is around 77% in our country.

While the employment of non-disabled individuals between the ages of 15-64 in the EU is 67%, this rate is 47.3% for persons with disabilities. Turkey for these ratios are 51% and 41%, respectively. The highest employment rate in the EU for the disabled is in Sweden (%66.2), and the lowest in Hungary (%23.7). In Turkey out of 90.131 persons with disabilities 12.223 individuals are employed in the public sector while 77.908 work in the private sector.

While the participation rate for various education programs (lifelong learning) between the ages of 25 and 64 is 9.8% for individuals without disabilities, this rate is 6.9% for persons with disabilities. In Turkey, these rates are respectively 1.7% and 4.1%. Higher education completion rate of people with disabilities in the EU, 22.1% between 30-34 years of age, where this rate is 6.8% in Turkey.[1]

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[1] https://ey-der.com/ana-sayfa/turkiye-ve-dunyada-engelliler/

There is no detailed data regarding spinal cord injury in our country. Out of 2500 who are suffering from spinal cord injury due to traffic accidents. These individuals also face social and physical obstacles that apply to all persons with disabilities.

3.1.1. Brief History of Policies and Social Services Intended for Persons with Disabilities

In Turkey's 1961 Constitution of Crucial Social Services and Policies for Persons with Disabilities in the Historical Process there have been articles regarding a customized education for persons with disabilities and a "Customized Education Regulation" has been created.

In Turkey, accessibility issues related to persons with disabilities has been enacted by adding to Annex Article 1 in 1997 to Zoning Laws article no. 3194 which was invoked in 1985 which states: "To make the physical environment accessible and livable for the disabled, it is compulsory to comply with the relevant standard of the Turkish Standards Institute in urban areas, urban, social and technical infrastructure areas and structures" (art. 47-48-Annex: 30/5/1997 -KHK-572/1 art.) Persons with disabilities will be fully integrated into the society if they live independently in accessible and accessible cities without encountering obstacles and without the support of anyone because of the physical structure of the spaces and the environment.[2]

In 1990s Turkey has started the establishing institutions to produce strategies for solving problems specializing in disabilities. First of all, the Prime Ministry Administration for Disabled People (BÖİB) was established in 1997 with the Decree Law No. 571.[3]

Prime Ministry Administration for Disabled People has been established "to ensure that services for persons with disabilities carry out regularly, effectively and efficiently; with the aim of establishing the principles, organization and duties of the Prime Ministry Administration for the Disabled People, to provide cooperation and coordination between national and international institutions and organizations, to help form the national policy regarding the disabled and to identify the problems of the disabled and to investigate their solutions"

In Article 20 of the Decree Law No. 571 which states; "The Council for Persons with Disability is the highest advisory board of the Presidency. It is responsible for making investigative and proposed decisions on disability issues. Meetings are held once every two years." Following this, the Council for Persons with Disability was held in 1999.

Commission members were affiliated to the Ministry of Labor and Social Security in February 1999 and retained under the Prime Ministry on May 6, 2003 and continued their work until 2011.

Commission reports prepared together in April, May and June were delivered to ADO in October 1999. ADP the first time in Turkey in 1999 with the establishment of the I. Council for Persons with Disability realized one of the most important decisions about the creation of the disabilities law took place. The Council for Persons with Disability was held five times in total and the responsibilities of this institution were transferred to the General Directorate for Disabled and Elderly Services after the PCU was closed in 2011.

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[2] (Şemsit, vd., 2016: 214)
[3] (Güngör ve Güneş, 2011: 31)

Disability issues in Turkey's Five-Year Development Plan (FYDP) have been included in under the "Social Services and Aids" genre. In 1. BYKP (1934-39), some basic points were determined within the scope of social security and social justice which were aimed to be realized in parallel with economic development. It is aimed to include low-income and strained people (orphans, elderly and persons with disability) in the scope of social security. 4. In **BYKP** (1979-83), it was planned to provide social services and social benefits for the elderly, children and youth who are in need of protection, and to groups of persons with disability, and to create a social services institution for the establishment and development of nursing homes, nursery and rehabilitation centers and other social facilities. 6. In BYKP (1990-94), to increase the quality and ensuring equal opportunities at all levels of education are determined as the main objective and a policy has been set for the establishment and development of the necessary infrastructure for the education of persons with mental, orthopedic disabilities, chronic illnesses and speech-impaired people with customized education (I. Council for Persons with Disabilities, 81-82).

BÖİB 'Turkey's Survey of Disability' was conducted in 2002 to address the lack of quantitative and qualitative information as people with disabilities. The research contained information about the disabled population's age, gender, educational status, marital status, labor status, social security status and expectations from institutions and organizations. Furthermore, information regarding the start of disability, because of it, level of disability and their treatments were also included regarding the extent and status of being treated and the rate of persons with disabilities in Turkey's population was reported to be 12.29%.

3.1.2. Status of Persons with Disabilities in Universities

In recent years with increasing number of universities in Turkey the undergraduate and graduate students' number is increasing. As of 2018, the number of universities has reached 185 (CoHE, 2018). Despite the increase in the number of higher education institutions, it can be said that the participation of persons with disabilities in higher education institutions is low. As a matter of fact, according to 2016-2017 data, a total of 40.017 disabled students continue to study (27.261 men and 12.756 women) at state and foundation universities (CoHE, 2018).[4]

3.1.3. Employment Status of Persons with Disabilities

One of the sine qua non of a fundamental human rights and an inclusive employment is the fact that persons with disabilities should be employed in equal working conditions. This is an important first, but also a fundamental step in combating discrimination in the labor market. Various laws and incentives have been enacted in accordance with that.

In the event that private sector employers work within the quota or as a quota or if they are not obliged to work with the disabled, all of the employers' shares in the minimum wage level (524,47 TL) have been changed to be covered by the treasury. Our citizens who are deprived of at least 40% of all body function can get a disability health board report from authorized health institutions and can register with the status of "disabled" by applying to the Provincial Directorates / Service Centers.

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[4] https://sarperarikan.com/2018/05/29/engelli-ogrencilerin-yuksekogretim-surecinde-yasayabilecegi-problemler-ve-cozum-onerileri/

Job power loss rate etc. rates are not taken into account and the whole-body function loss rate is taken in evaluation. If the disability health report states that a person cannot work, the person is not registered with their disability.

3.2. Status of Persons with Disabilities in Europe and the World

Every year, 250,000 to 500,000 people in the world are exposed to spinal cord injury (SCI). The vast majority of spinal injuries are due to preventable causes such as traffic accidents, falling or violence. People with spinal cord injury are less likely to die prematurely than people without spinal cord injury and have poor survival rates in low- and middle-income countries. Spinal cord injury is associated with lower school enrollment and economic participation rates which carries significant individual and social costs.

Cases of spinal cord injury are about 10,000 people per year in the EU, and more than 200,000 patients in the EU live with spinal cord injury due to normal life span. The impact on individual quality of life is high and social costs are enormous.[1] According to a different study, people with disabilities in Europe who have severe neurological damage in general need daily help (Wade & Hewer, 1997; Census and Research Bureau, 1998). It is estimated that currently 90 million people in the world have some form of spinal cord injury. In Europe, it is estimated that there are at least 330,000 people living with spinal cord injuries with more than 15,000 new cases added each year. Traffic accidents in two thirds of the cases are traffic accidents are the cause of injury and sports accidents, which make up 10%. About 80% of men with spinal cord injuries are between the ages of 18-25. Average living costs range from 0.45 million euros to 2.1million euros for injuries starting at the age of 25. Low quality of life and SCI-induced socioeconomic burdens for patients, families and caregivers make it imperative to seek solutions.[5]

The European Parliament has been referred to "more efforts should be made to make further progress in research designed to provide treatment for spinal cord injury as a part of a comprehensive policy for persons with disabilities."

In 2001, the World Health Organization (WHO) approved the International Functionality, Disability and Health Classification (ICF). Since ICF is an internationally recognized classification of the outcome of the disease, it is considered to be a useful and conceptual framework for datasets related to the results of SCI. In ICF, a person's functioning or disability is perceived as a dynamic interaction between health conditions and personal and environmental conditions. Many of the consequences related to spinal cord injury are not due to the condition itself, but to the inadequacy of medical care and rehabilitation services and obstacles in the physical, social and political environment.

The implementation of the United Nations Convention on the Rights of Persons with Disabilities (CRPD) takes the necessary measures to address these gaps and barriers[6]. Necessary measures for improving the health and participation of people with spinal cord injury include the following:

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[5] https://cordis.europa.eu/project/rcn/198795/factsheet/en
[6] https://www.who.int/news-room/fact-sheets/detail/spinal-cord-injury

- Timely, appropriate pre-hospital management: quick recognition of suspected spinal cord injury, rapid evaluation and initiation of injury management, including immobilization of the spine.
- Acute care (including surgical intervention) appropriate to the type and severity of injury, degree of instability, presence of neural compression, and in accordance with the wishes of the patient and their family.
- Access to ongoing health care, health education and products (e.g. catheters) to reduce risk of secondary conditions and improve quality of life.
- Access to skilled rehabilitation and mental health services to maximize functioning, independence, overall wellbeing and community integration. Management of bladder and bowel function is of primary importance.
- Access to appropriate assistive devices that can enable people to perform everyday activities they would not otherwise be able to undertake, reducing functional limitations and dependency. Only 5-15% of people in low- and middle-income countries have access to the assistive devices they need.
- Specialized knowledge and skills among providers of medical care and rehabilitation services.

Our project aims to make individuals, including young people with spinal cord injury, more active in professional and daily life through inclusive education, contributing to self-sufficiency and increasing their social inclusion.

4.TECHNOLOGY and PHYSICAL DISABILITY

4.1. What is Virtual Reality (VR)?

Virtual Reality technology puts users in a completely virtual environment created by a computer. More advanced virtual reality experiences are able to even provide freedom of movement where users can move digitally and hear voices. In addition, hand controllers can be used to enhance virtual reality experiences.

To experience virtual reality, one needs to wear virtual reality glasses. Most virtual reality glasses connect to a computer (OculusRift) or a game console (PlayStation VR); however, there are standalone devices (Google Cardboard is one of the most popular). Most standalone virtual reality glasses work with smartphones.

Within the scope of our research, participants were asked various questions both to see the relationship between technology and disability, and to identify the problems (inclusion) faced by persons with disabilities.

Persons with disabilities who have participated in the survey have answered "one of the biggest obstacles to the inclusion of physical activities in the physical activities" question with; "transportation and logistics problems they face when they step outside(46%)", "lack of facilities and materials to perform physical activity (30%)", "disability itself serving as an obstacle in performing physical activity (22%), "lack of friends to do sports, physical activity (20%)" and "lack of companion (15%)".

Technology can be used as a tool for the youth with SCIs to overcome the obstacles in their involvement in the aforementioned physical activities and to be included in social life, to become

empowered, self-sufficient people. As we can see from the responses of the respondents, most of the survey participants have access to computer and to phones which makes games a good tool regarding their inclusion. Detailed findings are given in the relevant part of the report.

Several examples from Turkey and the world over can benefit from the technology for the removal of obstacles in the form of what has been compiled below.

4.2. Best Practices in Turkey

WeWALK

WeWALK is a smart cane for the visually impaired. WeWALK detects obstacles above chest level with an ultrasonic sensor and vibrates when these objects are near. It alerts users if there are low hanging trees, traffic signs, poles and other obstacles. The cane can be customized, and one can change obstacle detection distance, sound level and more via WeWALK App.

WeWALK is integrated with Google Maps and Voice Assistant. In the future, WeWALK will be integrated with public transportation, ride sharing apps and smart cities. These new integrations will install through periodic software updates.[7]

Robotel

The Enable Movement (EnablingTheFuture) started with two people who made a robotic hand (mechanical hand) to a child who does not have fingers and developed with the participation of people from all over the world. Briefly, Enabling the Future is a platform where affordable and utilizable robot hand applications are shared with 3D printers in custom-made sizes and qualities for individuals who need prosthetics.

In addition, due to the materials of prosthesis types, patent applications, and disadvantages of manufacturing - distribution - retail sales chain, current prostheses are far above the prices which families with low and medium income can afford. Robotic hands are useful for both adults and children and teens; because it is both cheap and functional.[8]

Smarttek, EyeNavigator Eye Tracking System

Eye tracking system EyeNavigator, is used for computer communication in autism patients, ALS (amyotrophic lateral sclerosis) cerebral palsy patients, partial paralysis patients and spinal cord injuries. This system already exists in the world. The aim of Smarttek Eye Navigator is to provide this technology to its customers at an affordable rate such as a mobile phone price.

Due to EyeNavigator, people with disabilities can do many things on their own, without the need for any other movement, using only their eyes. E.g.; using a computer, listening to music and watching videos.

With the Smarttek Eye Navigator emergency call system, any emergency calls can be made via a telephone line with just a few eye movements. Thanks to EyeNavigator's smart keyboard system, it

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[7] https://wewalk.io/tr

[8] http://www.robotel.org

enables the disabled to communicate with the environment without getting tired by choosing certain word groups in advance. [9]

Tolkido

Tolkido is an educational material that makes visual education cards used in language and speech education of children with autism individualized and vocalized. In addition, it carries the education out of school by making the objects in the living space of the child with autism vocal and interactive.

A teaching with script is a type of teaching with vocabulary or written words, phrases or sentences, which enables children with autism or severe pervasive developmental disorders to initiate social interaction and conversation and to continue speaking. Tolkido enhances the proven effect of scripted education with high technology.[10]

Braille Teknik

Braille Teknik develops and provides new technologies, products and systems to support the education of the visually impaired while reducing and eliminating obstacles they face due to their visual impairment.

There are a number of technologies that remove obstacles. Due to the cameras within the system a student with visual impairment can listen and touch (Braille Alphabet) the book, the blackboard or the screen that they're trying to read from. In addition, there are options such as turning on and off, repeating and recording voice commands.[11]

3D Printing Museum

Faculty members from Anadolu University established the Museum of 3D Printed Works, where visually impaired people can make sense of the works in museums through touching.

The 3D Printed Works Museum embodies important works of art in the museums around the world with a 3D printer. In addition, the Braille alphabet provides information about the works with informational cards and audio descriptions, allowing them to be easily understood. To summarize, a distinctive museum has been founded in which visually impaired individuals can visit and make sense of the artifacts from museums around the world. The designers of the project determined that the visually impaired could not make sense of the works in the museums because they could not touch them and decided to prepare a customized museum tacking aforementioned problem.

60 historical artifacts have been re-created in 3D within the scope of the 3D Printed Works Museum. These artifacts include archeological finds and monuments from different eras within the history such as the first knives, the skull sample of homo sapiens, the helmet used by Macedonian soldiers, the Hammurabi Laws, sarcophagi belonging to the Egyptian leaders, Egyptian pyramids, the statue of David, the bust of Atatürk, and archaeological finds.[12]

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[9] http://www.smarttekas.com.tr
[10] https://www.tolkido.com
[11] http://www.brailleteknik.com
[12] https://bigumigu.com/haber/anadolu-universitesi-nde-gorme-engellilerin-eserlere-dokunabildigi-3b-baski-muze/

4.3. Best Practices in the World

Xbox Adaptive Controller

Microsoft, with its new control controller Xbox Adaptive Controller developed for Xbox, enables individuals with various physical disabilities to be able to play games. The Xbox Adaptive Controller has two programmable large buttons and 19 jack inputs. Through these 19 inputs, joysticks with a wide range of functions can be connected, such as in C64, buttons and switches. In this way, an individual who cannot use his right arm and an individual who cannot apply pressure to his fingers can play Xbox One and Windows 10 games.[13]

Ford, FeeltheView

Ford Italy has developed a "smart window" technology called FeeltheView, which transforms outside landscapes into vibrations for visually impaired individuals. The device works by photographing outside images and converts the photo into a high-contrast grayscale image. With 225 different intensity levels, each shade of gray gives unique vibrations that make the visually impaired passenger feel what's outside through touching. There is also a voice assistant, which can be connected to the car's audio system, that provides detailed landscape descriptions.[14]

Braille Neue

24-year-old Japanese designer Kosuke Takahashi has created a new type of writing that will allow visually impaired and persons with no disabilities to access information equally. This type of writing, Braille Neue, is a combination of standard letters and Braille. In Braille Neue, English and Japanese characters intertwine with their Braille equivalents thus resulting in an alphabet for both visually impaired individuals and those who have no visual impairments.[15]

Skoog

Skoog is a customizable electronic cube-shaped musical instrument. With a goal to make music and music production more accessible Skoog, with its tactile operating system, is a device for anyone who has difficulty playing standard musical instruments. From children to the elderly, from persons with disability to those who are not talented in the field of music, Skoog provides important benefits, especially in music therapy and special education.[16]

Hearing Rescue

HearingRescue, developed with the support of BBDO Bangkok as a result of the cooperation of Thai Health Promotion Foundation and Bangkok Association for Hearing Impaired who work for the health and well-being of Thai people, is actually an updated, transformed version of ordinary hearing aids. The designed device can be used like an ordinary hearing aid during the day. However, it has a mechanism that can be worn on the wrist when it is removed from the ear. When attached to the wrist, the device goes directly to night (or sleep) mode and if a sound is heard that indicates potential danger in the environment, the sleeping person is awakened through vibrations.[17]

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[13] https://www.xbox.com/en-US/accessories/controllers/xbox-adaptive-controller
[14] https://www.dezeen.com/2018/05/06/fords-feel-the-view-smart-window-blind-passengers-technology/
[15] http://brailleneue.com
[16] https://skoogmusic.com
[17] https://bigumigu.com/haber/engelleri-asan-teknoloji-ve-yaratici-projelere-10-basarili-ornek/

Accessible Talkback Editor

"AccessibleTalkback Editor" is software that enables visually impaired individuals to make an accessible text reading and editing on Android devices. With this software, visually impaired individuals can hear and edit the text they want to read out loud.

E. ABOUT THE PROJECT

1. Summary, Background and Objectives

Around 15 per cent of the world's population, or estimated 1 billion people, live with some form of disability and out of this number approximately 150 million people have significant disabilities (UN). Persons with disability have much more socioeconomic disadvantages than people without disabilities. The most important disadvantages are the disruption of education or not starting the educational life, poor health conditions, low employment and poverty.

The legal, economic, social and cultural conditions of the countries can ease the burden of these obstacles as well as further aggravate them. Sometimes these conditions pose a major obstacle to the participation of persons with disabilities in social life and to become active citizens. Important factors such as public transport difficulties, non-accessible structures, restricted access to ICT vehicles, inadequate care and health services, and insufficient supports cause the aforementioned problems.

One of the most common disability is the spinal cord injury (SCI). Spinal cord injury is a paralysis caused by damage to the spinal cord for various reasons. A significant part of the spinal injury (SCI) patients lose the ability to walk partially or completely and have to use a wheelchair. This permanent damage leads to loss of muscle functions, sensation and autonomous functions. According to the data presented by the Ministry of Health the number of SCI in Turkey is approximately 150,000. It is recorded that 34% of current spinal cord injury cases are seen in people between the ages of 20-29. Although there are no comprehensive statistics specific to our country, the age range in which spinal cord paralysis is most common in the world is 20-29 in men and 15-19 in women (WHO). WHO states that 250-500.000 individuals suffer from SCI every year, approximately 30% of SCI patients suffer from severe depression as a result of non-self-sufficiency.

Many of the consequences related to spinal cord injury are not due to the condition itself, but to the inadequacy of medical care and rehabilitation services and because of barriers in the physical, social and political environment which prevents people with spinal cord injury from taking part in their communities. To overcome these gaps and obstacles, the Convention on the Rights of Persons with Disabilities needs to be fully implemented. Gündüz B. (2010) states the employment rate is only 21% and the post-injury rate needs to be maximized via educational and social activities. Kurtaran (2014) also shows that the rate of returning to work is only 14.6% among the SCIs.

Seçinti, Yavuz & Selçuk (2017) have found that the most important problems of youth facing SCIs is depression due to inability to do their daily work and its negative affect on their family members. Although it varies from country to country in the EU, the problems faced, their causes and consequences are similar. For example, life satisfaction levels of individuals with SCI in Poland, which is one of our partner countries in the Project, is around 23.5% where the EU average is 36.1%. Again, the same research illustrates that the important factors in low youth satisfaction are problems faced

in participation in sports activities, getting marriage and work (CORDIS 49543). A similar situation is observed in the Czech Republic and Greece.[18]

The project has been designed based on aforementioned problems and needs. One of the most crucial problems of youth with SCI is that they are not self-sufficient and cannot actively participate in the daily life. Young people who spend time at home inactively, with depression and feelings of hopelessness, face problems such as loss of muscle and inability to use existing muscles in a coordinated way. Our project is in an effort to find solutions to these problems.

The ultimate goal of our project is to empower the youth with spinal cord injury to be included in social life and become self-sufficient people. This will be achieved by combining technology and sports, through innovative outputs. Apart from the main goal, our other aims are;

- Creating 3 VR (virtual reality) applications that will help the youth with SCI to overcome their immobility difficulties.
- Increasing the employability of the youth with SCI and to support them in being societal and active citizens.
- Producing and testing a social inclusion program that complements the VR application to be produced, using international, non-formal teaching methods.
- Contributing to the social integration of the youth with SCI.
- Increasing the usability of assistive technologies and devices in this field, thus contributing to raise the living standards of the youth with SCI.

In order to meet the needs of the youth with SCI, our project requires expertise and experience of our partners. Our partners from Turkey and other countries will come together to benefit from the expertise and experience of one another in order to put forward comprehensive and innovative results. Project is carried out by five partners from Turkey, Poland and Greece consist the following institutions;

- Bahçeşehir University (BAU)
- Development and Innovation Office (KİO)
- Silesian University of Technology (SUT)
- International Paraplegic Youth Association (UOFD)
- Tyrtaios Disabled Sports Club (Tyrtaios)

Bahçeşehir University Virtual Reality First LAB (VR First LAB), who is the coordinator of the project, is a pioneer in its field in Turkey. International Paraplegic Youth Association (UOFD) is a non-governmental organization that works directly with the target audience and offers vocational training programs for the youth with SCI. The Development and Innovation Office (KIO) supports active citizenship through social inclusion and non-formal educational programs for the disadvantaged youth. Silesian University of Technology (SUT) established a "Virtual Reality Center for the Disabled", a first in Europe, and carries out studies related to the subject. In addition, TRYTAIOS Sports Club is a sports club for persons with disabilities that trains athletes at the Olympic level. They carry out sports activities and events in real life with the youth who have SCIs.

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[18] http://www.paspa.gr

2. Project Idea / Intellectual Outputs

"Virtual Reality 4 Inclusion" project brings fields of technology and sports together. In line with the goals and objectives of our project, three fundamental outputs will be produced. These outputs are;

O1. Field Research Regarding The Needs of the Youth with SCI: This field research will be carried out in depth and will be carried out one-to-one with the target audience through focus group discussions and online discussions to identify the needs. Two other outputs (Virtual Reality Applications and Social Inclusion Program) that will be produced at the same time will be designed and developed hand-in-hand with these research results.

O2. Hope for the Future Virtual Reality Applications: Using the findings of the research, three virtual reality applications (games) will be designed in order to meet the physical exercise and entertainment needs of the target audience which will be made available to everyone, free of charge.

O3. Social Inclusion Program for the Youth with SCIs: Similarly, by using the results of the needs research, a social inclusion program will be prepared including all the details and materials related to the instructor guide and the raining program, which will also allow the use of virtual reality applications. After this inclusion program has been tested in local and international trainings, it will be shared free of charge and will be open to the use of relevant individuals and institutions.

3. About the Report

"What Does the Youth with SCIs Need?" will be essentially a perception and needs research, also serving as a roadmap. Aside from identifying the deficiencies of the youth with SCIs in social fields such as societal inclusion and active citizenship methods and tools will be determined for physical (muscle) development. In essence, this research will not only be a need identifying research or survey but will also reveal what individuals with spinal cord injury, their relatives and those working in this field (faculty members, educators, experts, social workers) think about the problem.

Apart from this, the research will also seek answers to what elements should be included in the O2: Virtual Reality Games and O3: Social Inclusion Training Program outputs, which will be designed concurrently with the research. For example, in our O2 output, sports activities are planned to be included in the three VR mobile applications which will be designed. Answers will be sought regarding how the contents of these outputs should be designed, what tools and methods will be more effective and interesting designed for the youth with spinal cord injury.

Regarding the innovative aspect of our output, neither our country nor the project partners or the EU have carried out specific studies on this issue. For example, no one has comprehensively and systematically investigated the obstacles of a young person with a spinal cord injury not wanting to participate in education or the workforce, the obstacles they want to overcome, and what they want the trainings to include. Researches are based on statistics, which include superficial criteria and data within general welfare and health researches or clinical studies. It will be a first in this respect and it is very likely that crucial and undiscovered findings will emerge. These research outputs can be an example to EU countries, strategy makers and public institutions, and can serve as a reference for many

studies and can be included in policy documents. Apart from this, partner institutions and the target audience will be able to announce their needs and find a way to make them systematic.

Since the research is based on systematic and scientific methods, it can be disseminated across the EU by differentiating this systematic by country and target groups. Research outputs and reports will be shared with the European Disability Forum, Erasmus + Project Results, EU Disability Network and The Academic Network of European Disability Experts (ANED). It will also be shared with the Ministry of Family and Social Policies, Disabled and Elderly Services General Directorate, institutions and NGOs who are carrying out works related to the subject.

4.Distribution of Roles, Methodology and Walkthrough

A five-step plan was followed in the production of the outputs:

1. Fundamental Research and Planning: In order to reach the target and to meet the needs of young people with spinal cord injury, the current situation needs to be determined, and the goals and objectives should clearly be stated. Accordingly, task distribution, time and human resource planning, methodology and tool selection and implementation methods were determined. All partners acted with common consensus.

2. Research Design: Research design has been completed. In this context, answers were sought in three main fields in line with the objectives of the research. All partners accompanied the design and planning section.

3. Implementation: Researches with the target audience were carried out in project partner countries namely Turkey, Poland and Greece. Various questions were asked such as the target audience's age, gender, educational status as well as their relationship with technologies and level of awareness and their involvement in social life and physical activities, which can be seen in the findings. The target audience below has been included into our research.

- Youth with SCIs
- Relatives of young people with SCIs
- Experts
- Decision makers
- Representatives of NGOs working in this field

Researchers and social workers from each project partner took part in the research.
The number of institutions and staff taking part in the research process is as follows;

- BAU: 1 researcher
- UOFD: 1 researcher
- KIO: 2 researchers
- SUT: 1 researcher
- Trytaios: 1 researcher

Methods and tools used during data collection are presented below:

- Face-to-Face Discussions
- Group discussions
- E-Mails
- Online Surveys

The survey within the scope of the research consists of three main sections: demography, technology and inclusion. Answers were collected from the respondents by face to face discussions, online surveys and group interviews. The data collected from different countries were brought together, then analysis was carried out using the SPSS program.

4. Compilation of Findings: The design for the report to be created is as follows.

- Introduction: Information has been provided on the subject.
- Current Situation: Includes the current state of Turkey, partner countries the rest of the EU countries.
- Research (Methodology, tools, results): Number of people reached, questions asked, research axis, interviewees, methods used, and the results will be compiled and presented.
- Suggestions and Recommendations.

5. Contribution and Dissemination

After the report is finalized, all project partners will share the report output locally, regionally and nationally with the relevant people and institutions in their networks. In order to be used by wider audiences, people related to the subject and to be delivered to the decision makers, the report will also be shared on various platforms and events such as congresses, conferences and. It will also be accessible on the www.vr4inclusion.org.

F. NEEDS and FIELD RESEARCH

1. Research Outcomes and Findings

1.1. Profile of the Respondents

A survey was conducted with 126 participants from Turkey, Poland and Greece. 35% of the survey participants are female and 65% are male.

Chart 3. Gender
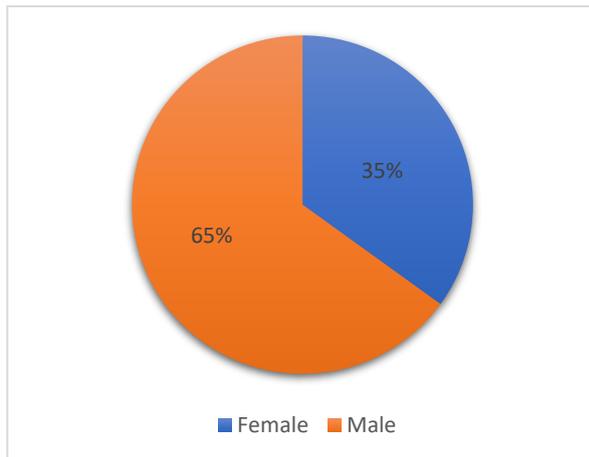
78% of the respondents are between 16-30 years old, 18% between 31-58 years old and 4% between 11-15 years old. 95% of respondents are single and 5% are married.

Chart 4. Age
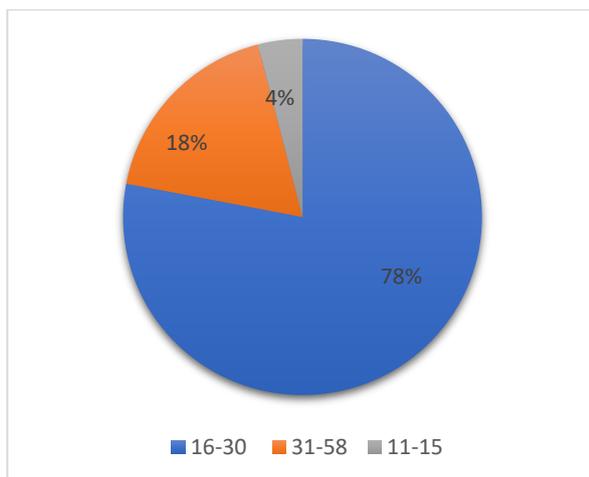
55% of respondents reside in Turkey, 25% in Greece and 20% live in Poland. The provinces where the respondents live are Ankara, Athens, Gliwice, Istanbul, Izmir, Bursa, Denizli, Antalya, Aydın, Muğla, Paczyna, Pyskowice respectively.
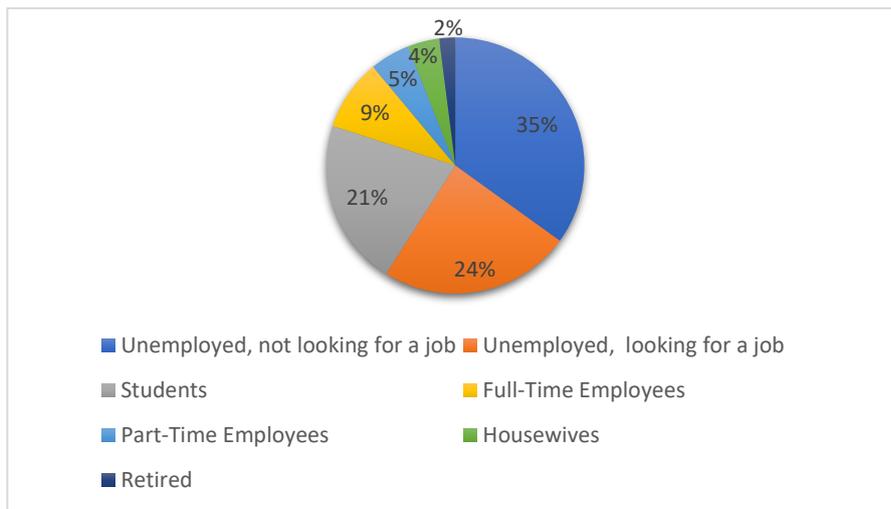
Chart 5. Country of Residence
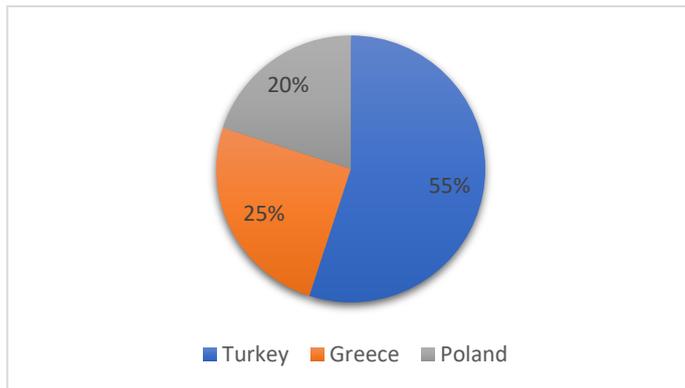
The education level of the respondents are; 53% high school graduates, 19% associate degree graduates, 17% primary school graduates, 4% undergraduate graduates, and 3% graduate / doctorate graduates. The remaining 4% were untrained.

Chart 6. Education Level
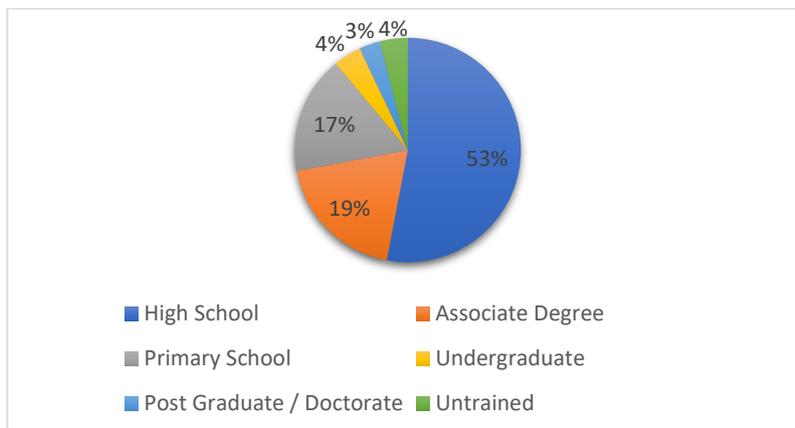
The employment status of those surveyed are 35% unemployed and currently not looking for jobs, 24% are unemployed and currently looking for jobs, 21% students, 9% full-time employees, 5% part-time employees, % 4 of them are housewives and 2% are retired.

Chart 7. Employment Status

Legend:
- Unemployed, not looking for a job
- Unemployed, looking for a job
- Students
- Full-Time Employees
- Part-Time Employees
- Housewives
- Retired

(35%, 24%, 21%, 9%, 5%, 4%, 2%)

77% of the respondents do not have professional experience. 12% of those have professional experience less than 1 year, 5% between 1-5 years, 4% between 6-10 years, 1% between 11-15 years, 1% more than 20 years.

Chart 8. Professional Experience

Legend:
- No Professional Experience
- < 1 Year
- 1-5 Years
- 4-6 Years
- 11-15 Years
- +20 Years

(77%, 12%, 5%, 4%, 1%, 1%)

Monthly income levels of the survey participants are; 78% less than 500 EUR, 20% between 500-1000 EUR, 1,6% between 1001-2000 EURO, 0,8% between and 2001-3000 EUR.

Chart 9. Monthly Income
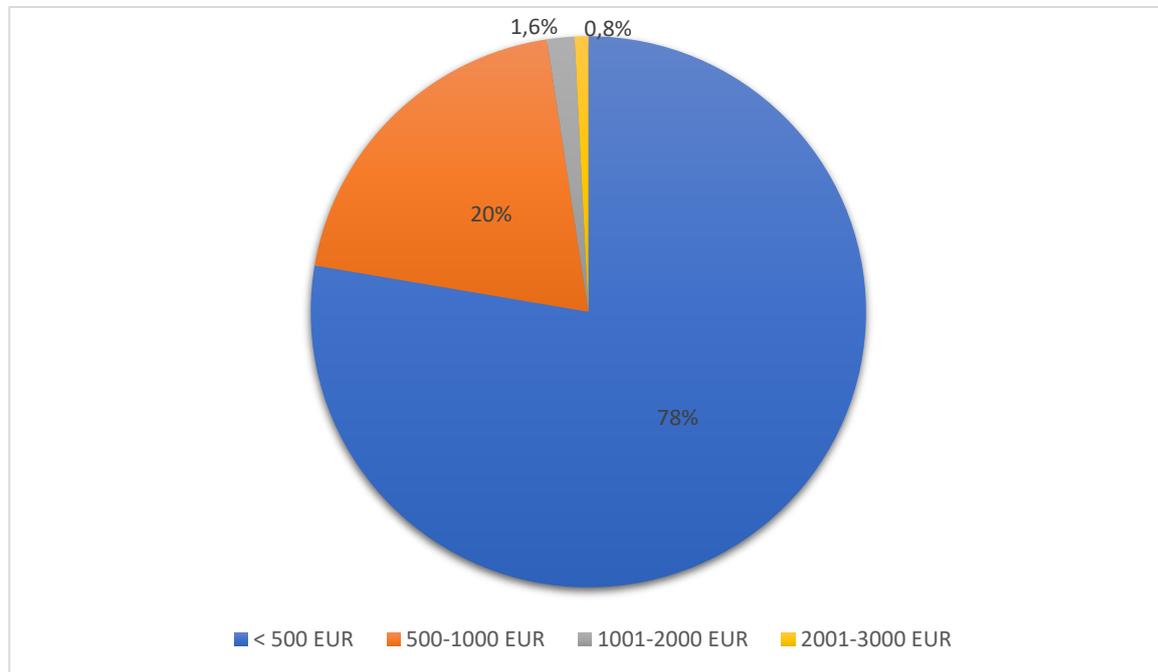
1.2.Technology

In this part of the survey, questions were prepared to determine the participants' current state and familiarity of technology. A summary graphic of the findings regarding this section can be seen below.

Chart 10 – Summary of Findings Related to Technology
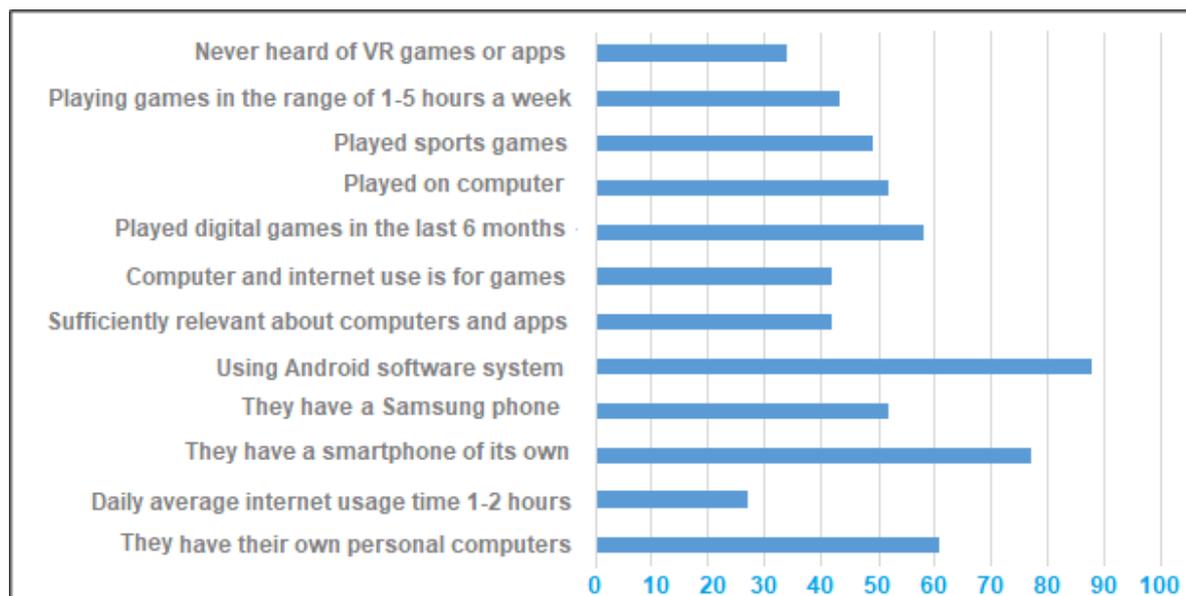
While 61% of the respondents have a personal computer, 39% do not have a personal computer. 60% of the respondents use the internet and 40% do not use the internet.

Chart 11. Internet Usage
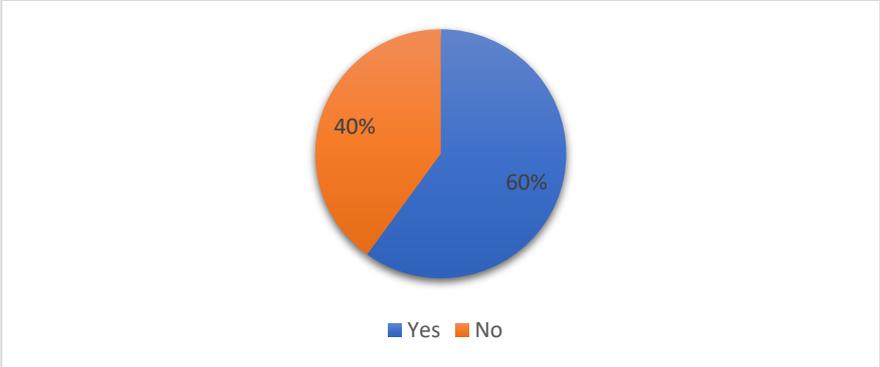
Average daily internet usage time of the survey participants is 27% 1-2 hours, 19% 3-4 hours, 18% 2-3 hours, 10% 0-1 hours, 7% 5-6 hours are 6% for 4-5 hours, 6% for 7-8 hours, 3% for 9-10 hours, 1% for 6-7 hours, 1% for 10+ hours.

Chart 12. Daily Internet Usage Time
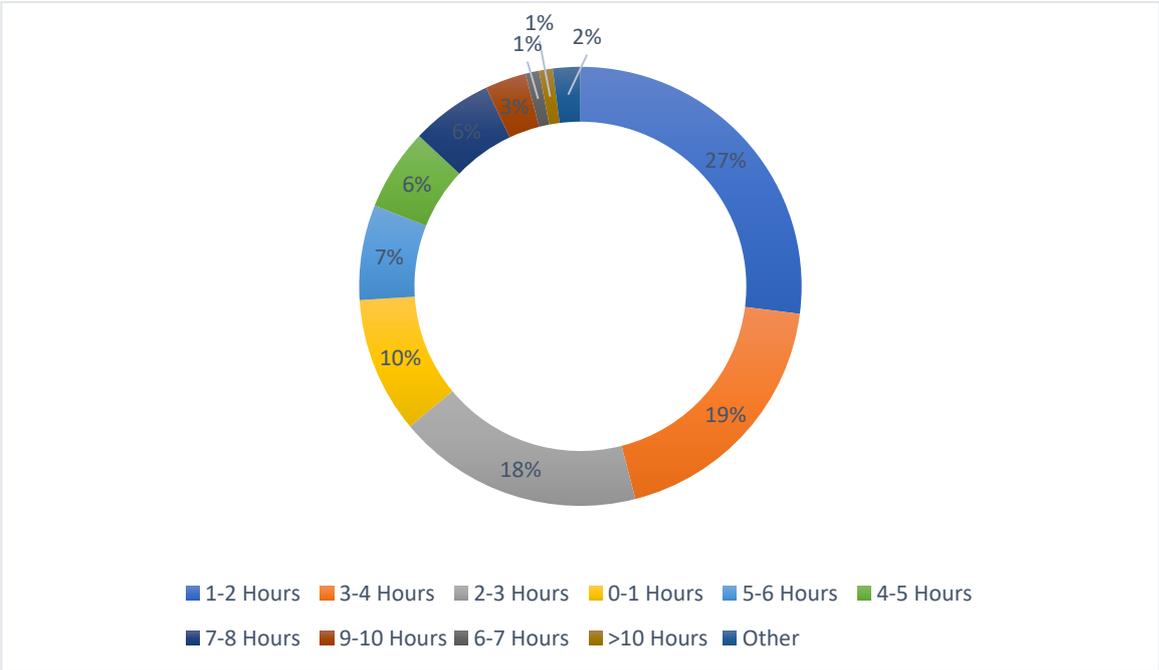
While 77% of the respondents have their own smartphone, 23% do not. 66% of the family members of the survey have smartphones. While 26% of those who have a smartphone in their family use their family's smartphone, 33% do not use their family's smartphone. 42% of the respondents use and

sufficiently interested in computer and phone applications, 22% are very interested and active users, 14% are not interested and do not use them, 12% are interested but do not have sufficient information to use, and 10% replied that they are less interested and less of a user of a smartphone.

Chart 13. Usage and Interest Levels of Computer and Telephone Applications
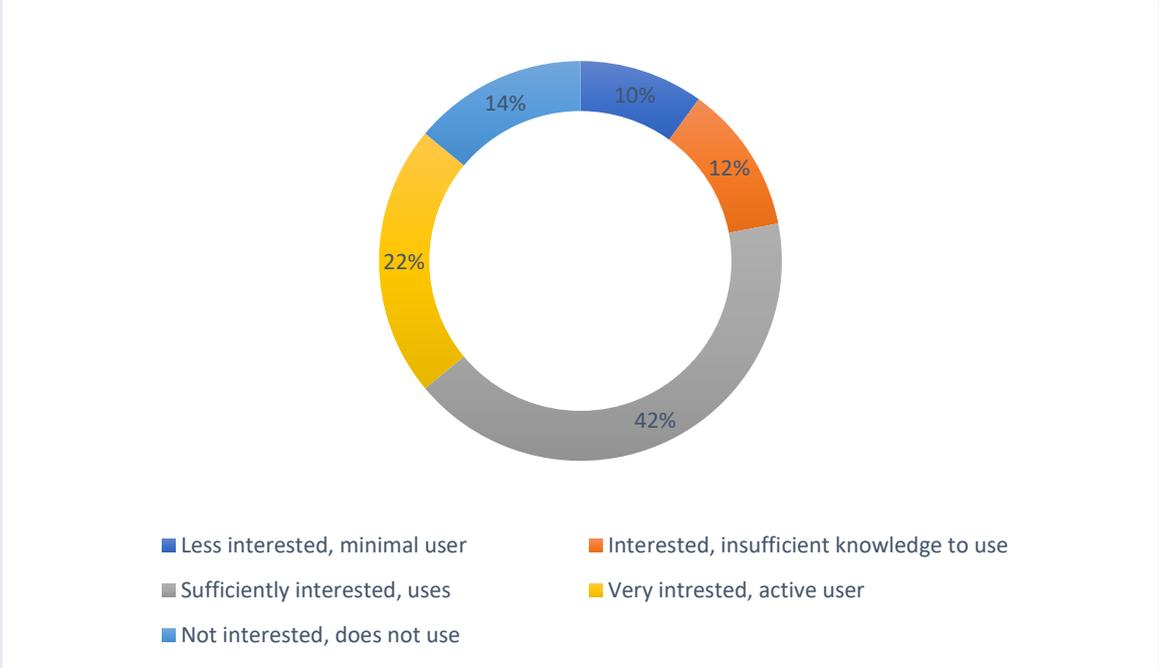

63% of the respondents' use their smartphone for communication 49% for social media, 39% for listening to music, 32% for gaming, 25% for watching videos, 16% for obtaining information, news source tracking and 7% uses for work / profession.

**Chart 14. Purpose of Smartphone Usage**
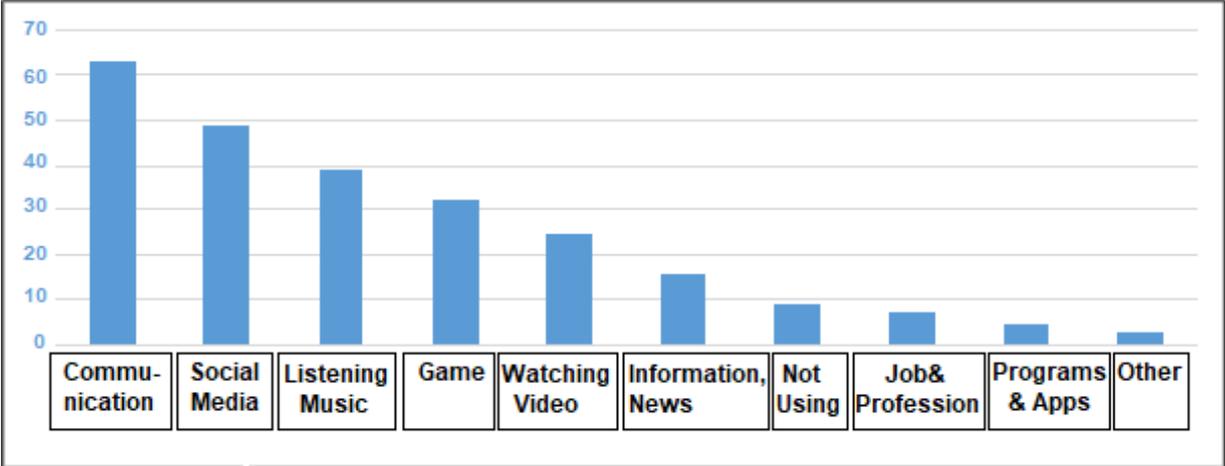
Participants in the questionnaire are uses computers and the internet for gaming (42%), social media (42%), watching videos (40%), streaming music (33%), acquiring information (24%), socializing (22%), work / profession (14%), programs and applications (8%) and 10% do not use either.

**Chart 15. Purpose of Computer and Internet Usage**
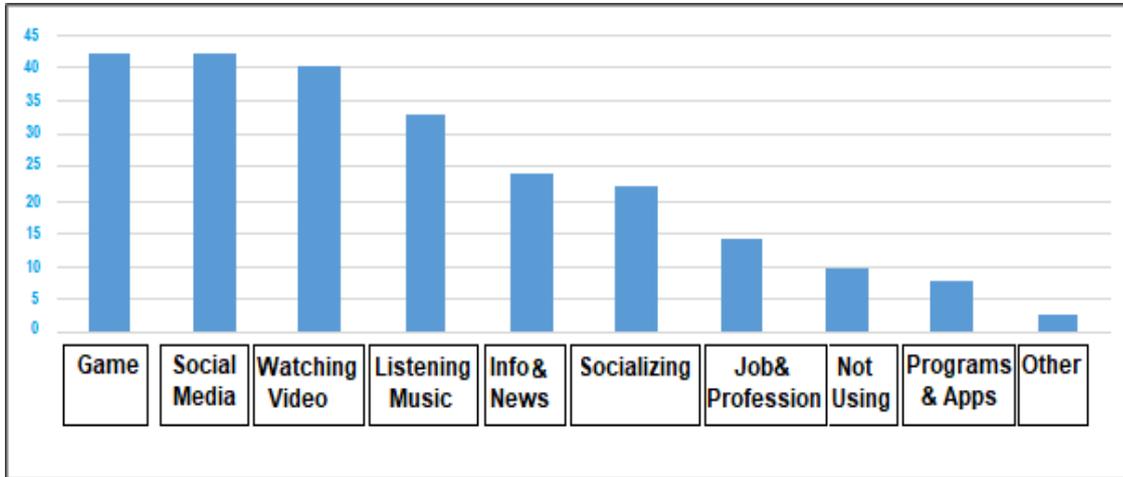
58% of the respondents have played some form of digital games (computer, phone, game console etc.) in the last 6 months. 52% of those who played have used computers, 49% used phones, 22% used game consoles while 15% used virtual reality glasses.

**Chart 16. Device Used by Gamers in the Last Six Months**
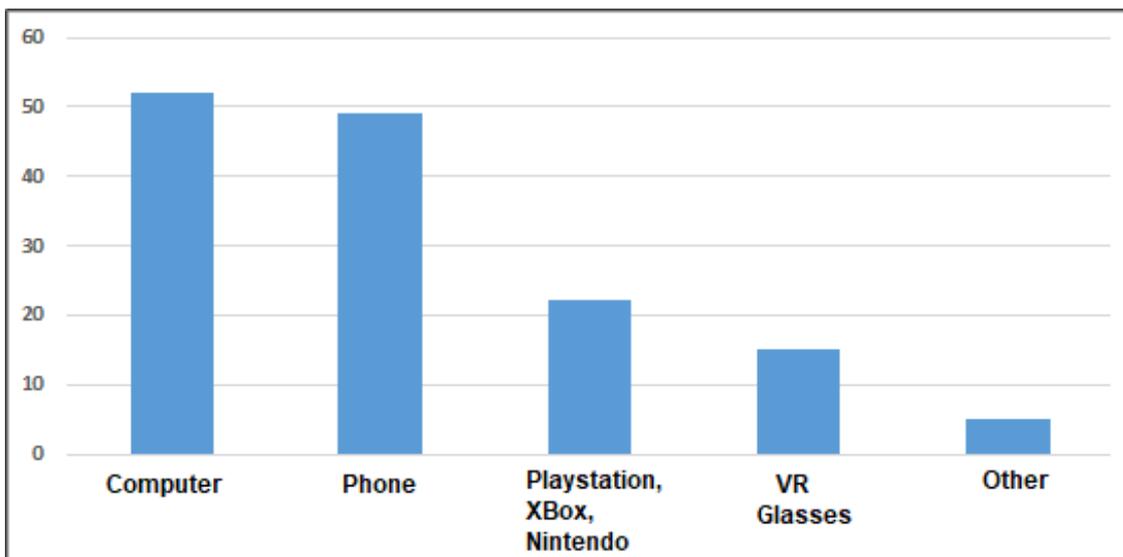
49% of the respondents played sports related games, 35% tactical / strategy games, 27% action games, 26% adventure games, 21% puzzles, 9% simulation games and 6% role-playing games.

Chart 17. Genre of the Games Played
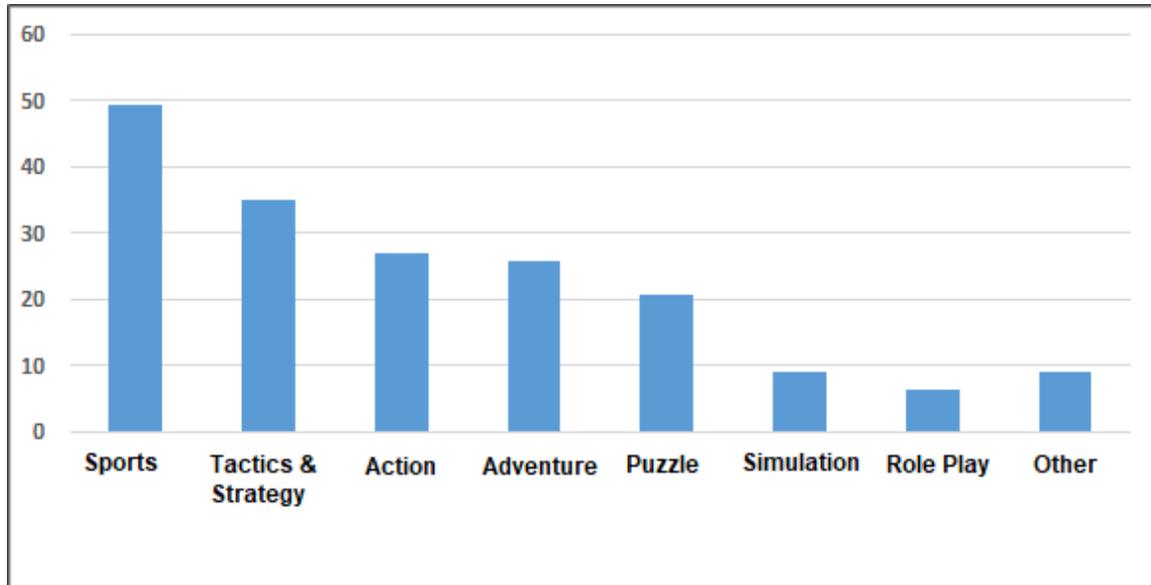
43% of the respondents play 1-5 hours a week, 21% 6-9 hours a week, 13% 14+ hours a week, 8% 10-14 hours a week.

**Chart 18. Time Spent on Playing Games / Weekly**
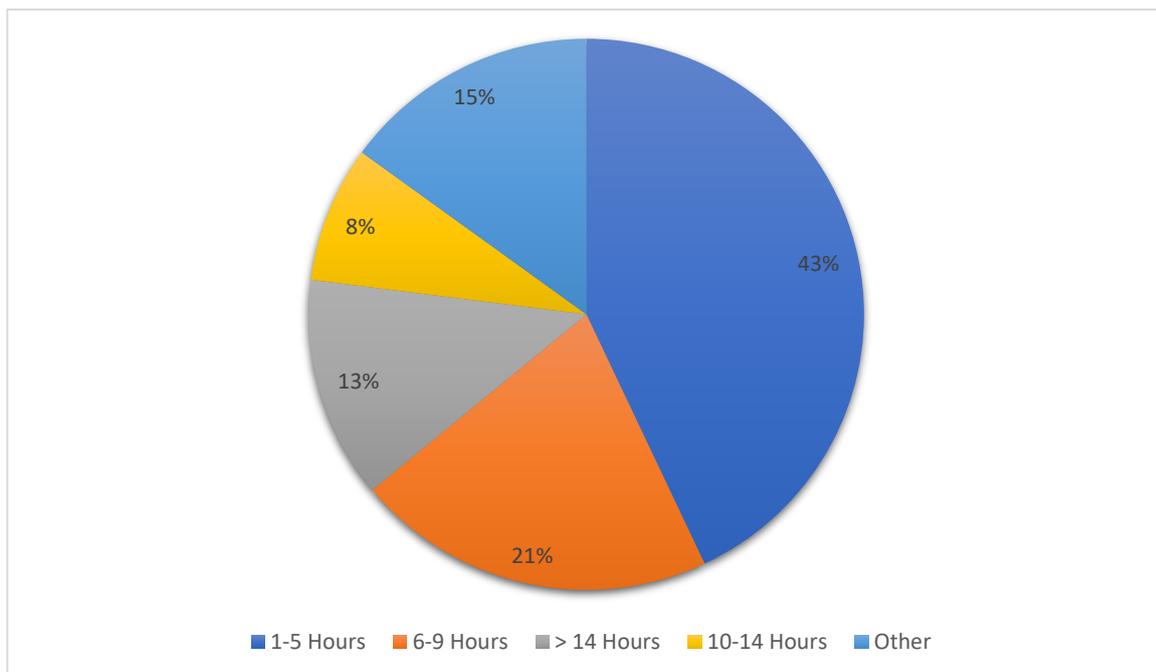
The level of interest and knowledge of the respondents about virtual reality applications / games are; never heard, I don't know what they are (34%), know what they are but never used (23%), heard from somewhere, but don't know exactly what they are (23%) and do know what they are have used (18%)

Chart 19. Information and Interest Rates of Virtual Reality Applications

Legend:
- Never heard, I don't know what they are
- Know what they are, never used
- Heard from somewhere, but don't know what they are
- Do know what they are, used
- Other
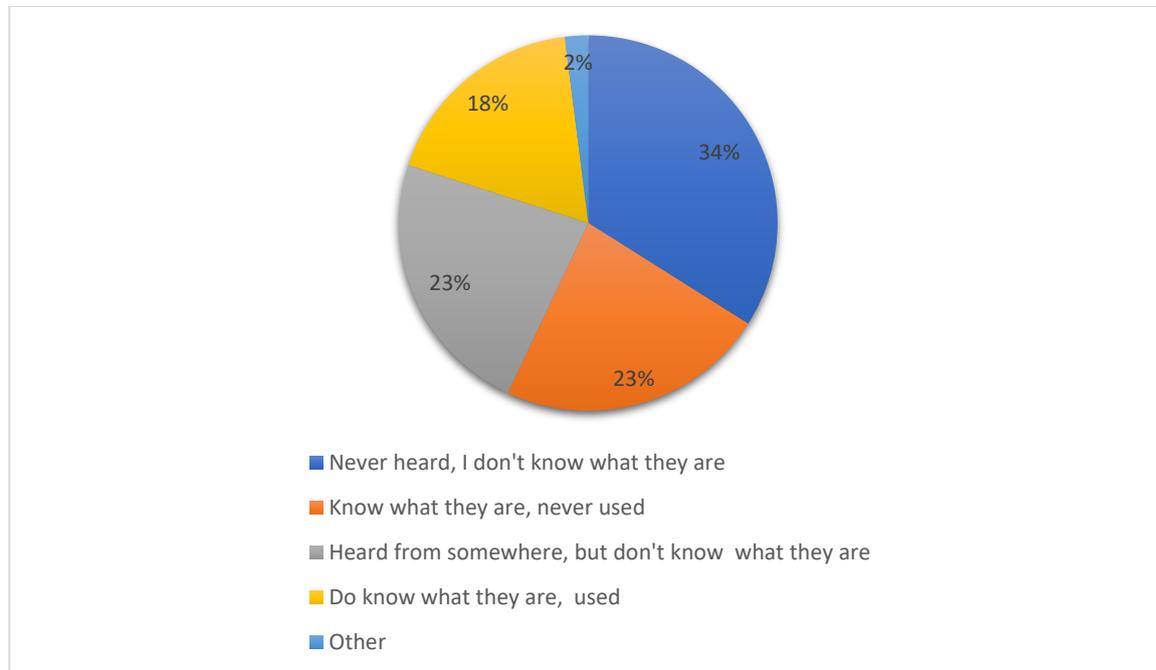
The respondents listed the types of sports that they would be interested in a game as follows; basketball (30%), football (20%), swimming (19%), horse riding (16%), archery (15%), boccia (15%).

Chart 20. Sports Preferences for Games
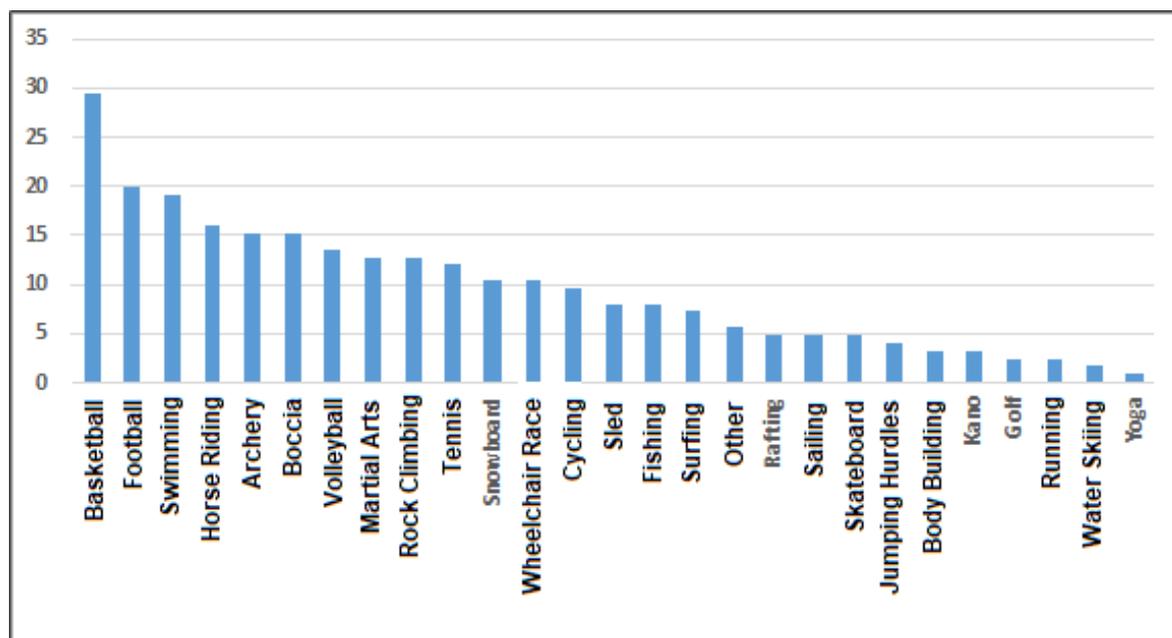
The level of knowledge and interest of the respondents about the sports / activities are as follows; 26% of them watch their videos on TV and internet, 25% are already doing / playing, 16% are very interested, follow their live broadcasts, 15% have always dreamt of playing, 11% are just curious and have done a lot of research about them, 2%, they know everything.
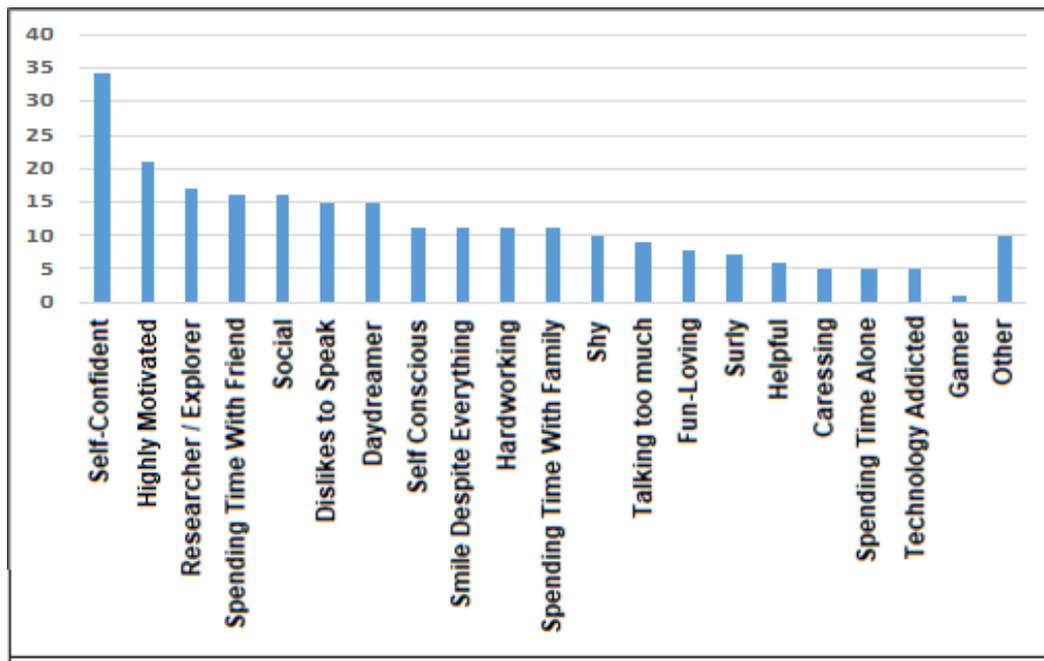
3.1. Inclusion

Participants in the questionnaire have identified themselves as loving (46%), benevolent (46%), self-confident (28%), love to have fun (28%), spend time with their family (28%), laugh despite everything (28%), introvert (22%), spends time with friends (22%), likes games (22%), shy (20%), talkative (17%), love to research and explore(17%), hardworking (16%), social (16%), day-dreamer (14%), spending time alone (14%), dislike speaking (13%), motivated (11%), technology dependent (9%), surly (6%).

Chart 21. Personal Identification Manners
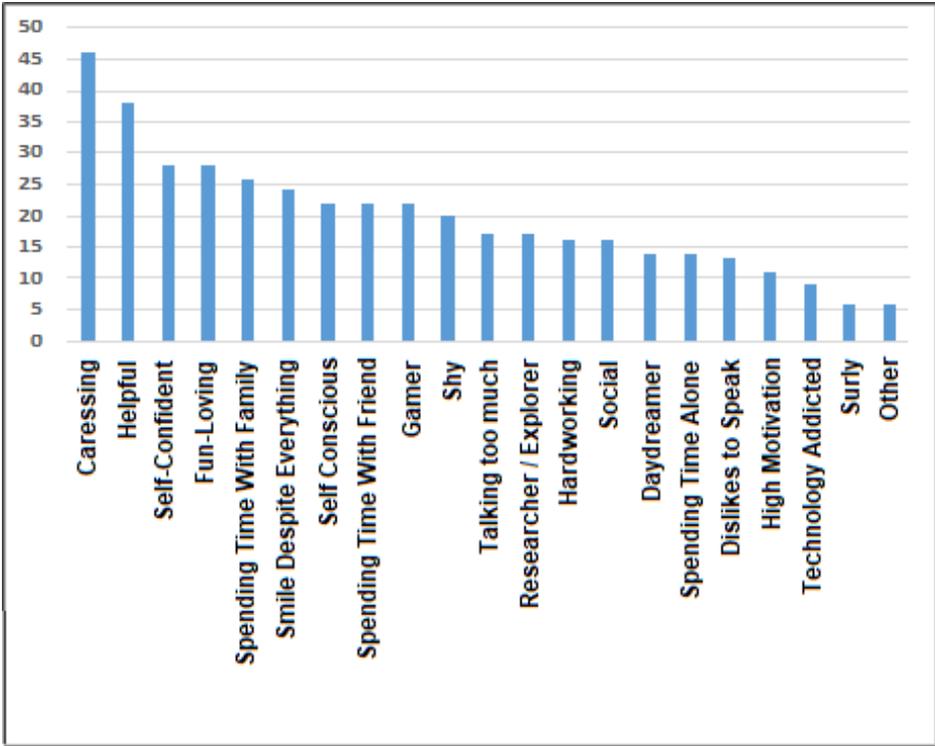
The characteristics of the survey respondents have deemed themselves lacking, self-confidence (34%), motivation (21%), love to research, exploring (17%), social (16%), day-dreaming (15%), do not like speaking (15%), introversion (11%), laughing despite everything (11%), hard-working (11%), spending time with family (11%), shyness (10%), talkativeness (9%), love to have fun (8%), surly (7%), benevolence (6%), loving (5%), spending alone time (5%), technology dependence (5%).

Chart 22. Lacking Characteristics

The participants deem following three obstacles that prevent the inclusion of persons with disabilities in physical activities;

1. Transportation and logistics problems faced when they step outside (46%)
2. Financial reasons (42%)
3. Lack of facilities and materials to perform physical activity (30%)

Other obstacles are;

- Lack of belief in themselves and what they can achieve (29%)
- Current prejudice and social pressure in their circle of friends and society (26%)
- Disability serving as an obstacle for physical activities (22%).
- Lack of friends to do sports and physical activities together (20%)
- Psychological conditions such as anxiety, nervousness and fear that comes out during the activity (18%)
- Lack of companion (15%)
- Insufficient support from the family (14%)

Chart 23. Obstacles Regarding the Inclusion of Persons with Disabilities in Physical Activities
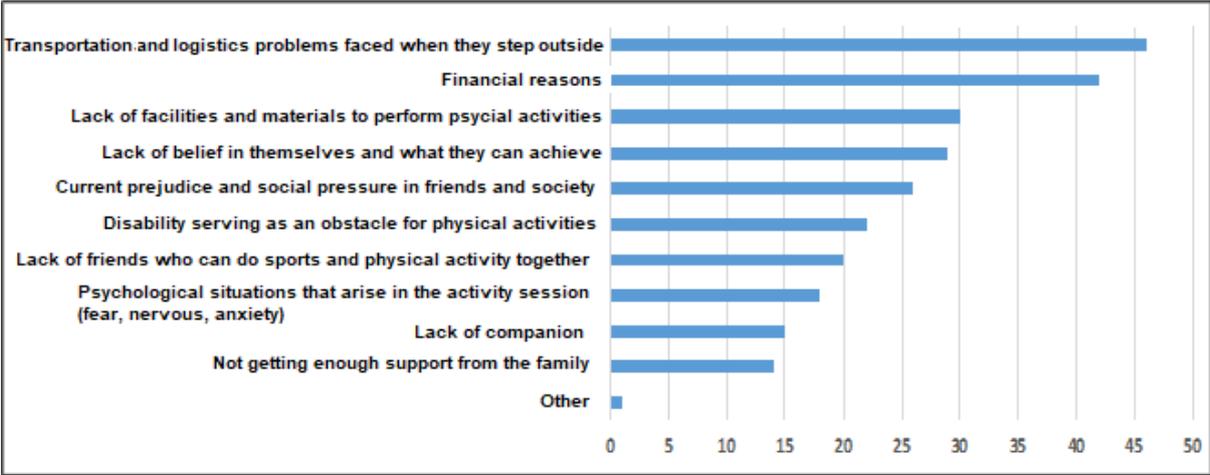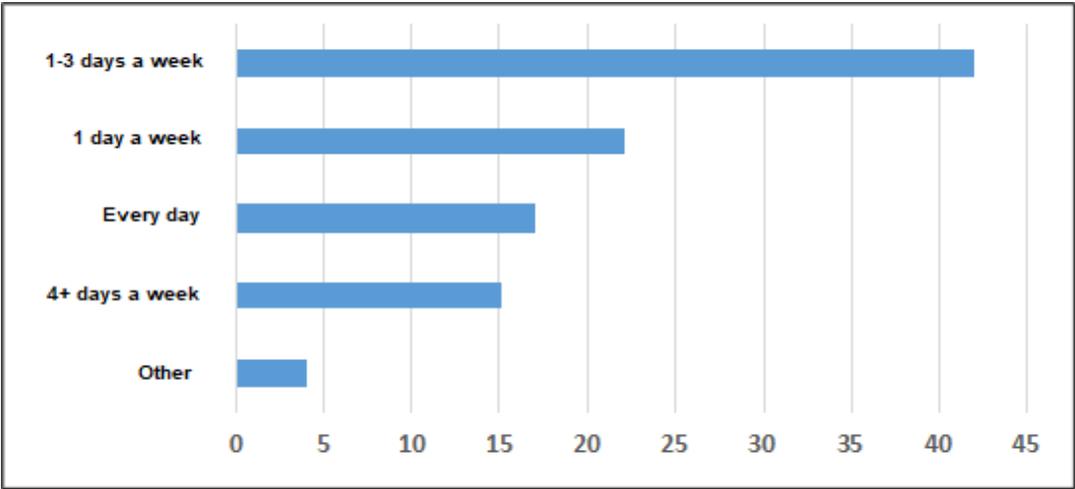

While 54% of the respondents stated that they have been participated in a form of physical activity (various sports, weightlifting, yoga etc.) in the last 6 months, 46% stated that they did not. Out of the ones who participate in sports 17% swam, 16% played boccia, 12% cleaned their living space, 9% played football, 8% have done shooting sports, 8% were in gymnastics, 8% played table tennis, 5% went cycling, 4% played basketball, 1% lifted weights. 5% chose the 'other' option.

Chart 24. Activities Performed in the Last 6 Months by Respondents Who Participated in Physical Activities
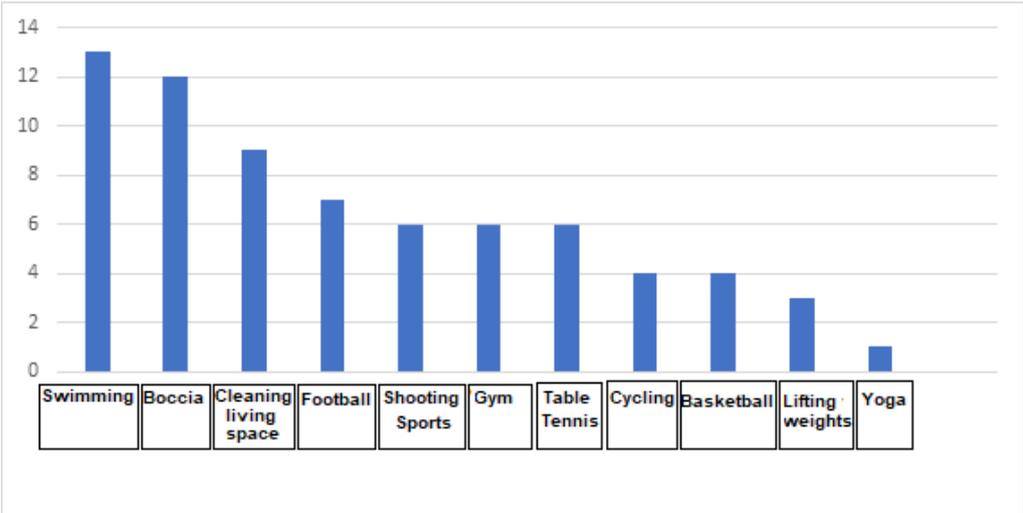
The time spent by the participants in the sport of their choice is; 1-3 days a week (42%), 1 day a week (22%), every day (17%), 4+ days a week (15%). 4% have chosen the 'other' option.

**Chart 25. Weekly Time Designated for Sports**

77% of the respondents stated that they have been involved in events involving social activities in the last 3 months, while 23% stated that they did not. 38% of those who have been doing social activities in the last 3 months chatted with their friends while 35% went to the movies, 29% watched movies with friends at home, 29% partaken in routine strolls, 20% played games with friends, 14% hiked, 7% went to concerts, 7% went to the movies, 2% volunteered. 9% chose the 'other' option.

Chart 26. Activities in the Last Three Months by Respondents Who has Partaken in Social Activities
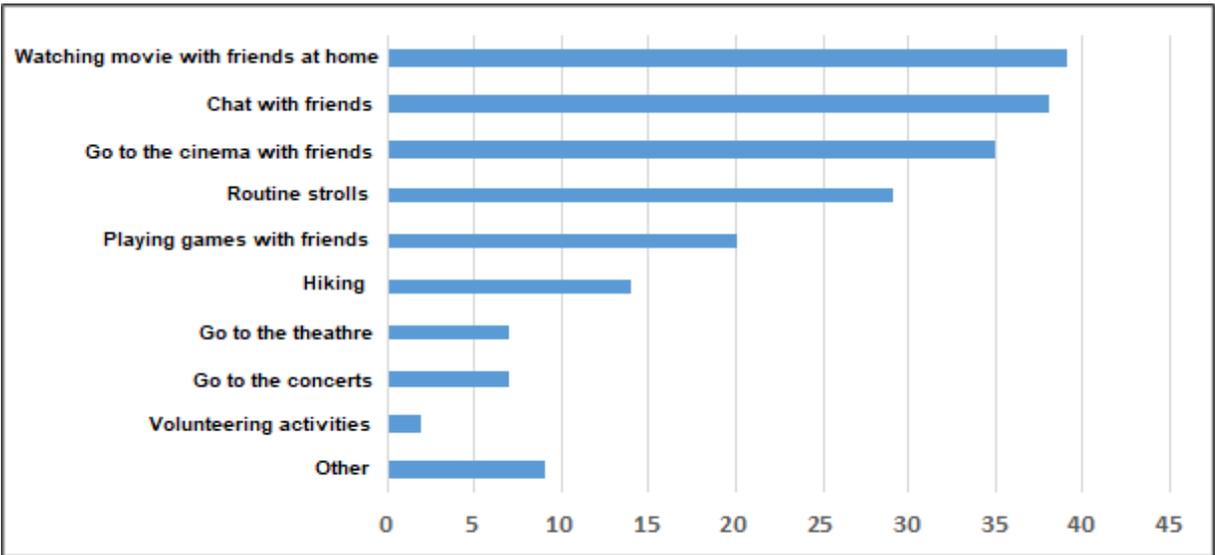
48% of the respondents partake in entertainment related activities, while 32% chose comedy, 27% action, 19% sports, 8% horror and 3% chose drama

Chart 27. Preferred Social Activity Genre
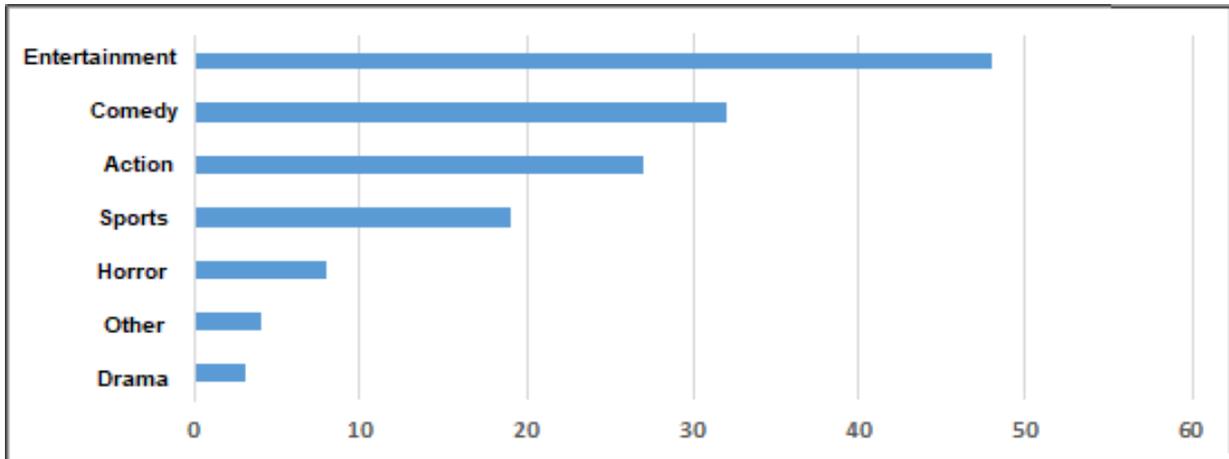
In the event that an education or training is conducted, 34% of the participants stated they would partake in trainings related to personal skills development, while 23% were interested in social inclusion and rehabilitation training, 17% social awareness and inclusion training, 16% team work and intra-group inclusion training, % 6 stated that they would participate in rights, violations and advocacy training and 3% would participate in project-based thinking and project development training.

Chart 28. Educational Themes That Respondents Want to Receive

The top 5 educational content the respondents expect in case of a training are as follows, self-confidence development (43%), healthy living (31%), social adaptation (29%), physical games (22%) and fun activities (21%). Other answers are presented in the table.

Chart 29. Preferred Specialized Training Topics
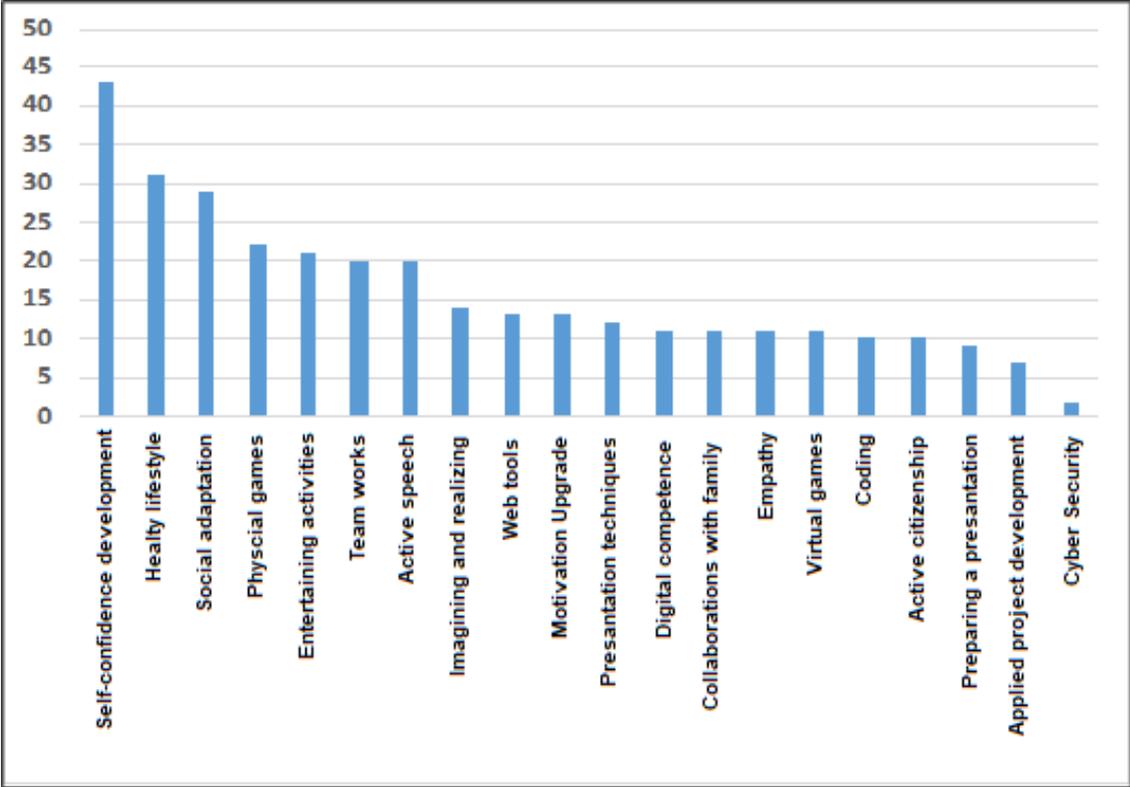
4. Evaluation and Conclusion

The ultimate goal of our project is to empower the youth with SCIs to be included in social life and become self-sufficient people. Technology and sports will be combined to achieve mentioned goal through innovative outputs.

For the sustainability of the projects that will be designed by taking the outcomes of our research into consideration the inferences and suggestions we deem important are presented below.

4.1. Problem Determination

In determining the existing problems, it is crucial to conduct research with the target audience in order to identify the primary problems. Outputs presented below can be utilized to determine the priorities and properties of the outputs that will be designed within the scope of this project and they can also give ideas to ones wanting to create solutions by using technology.

Within the scope of the research, the three biggest obstacles to the inclusion of individuals with disabilities in physical activities were determined as;

- Transportation and logistics problems faced when they step outside (46%)
- Financial reasons (42%)
- Lack of facilities and materials to perform physical activity (30%)

While other obstacles were determined. as;

- Lack of belief in themselves and what they can achieve (29%)
- Current prejudice and social pressure in their circle of friends and society (26%)
- Disability serving as an obstacle for physical activities (22%).
- Lack of friends to do sports and physical activities together (20%)
- Psychological conditions such as anxiety, nervousness and fear that comes out during the activity (18%)
- Lack of companion (15%)
- Insufficient support from the family (14%)

For our project it is crucial to determine which physical activities the youth with SCIs currently partake in to create innovative outputs by blending technology and sports to empower the target audience to become self-sufficient and incorporate them into social life. Within the research outputs related to their physical activity status have been reached.

54% of the respondents stated that they have partaken in a physical activity (various sports, weightlifting, yoga etc.) in the last 6 months. Of those who do sports 17% swims, 16% plays boccia, 12% cleans their living space, 9% plays football and 8% is involved in shooting activities.

Approximately 50% of the respondents stated that the time they spend for sports is between 1-3 days a week. On the other hand, chatting with friends was the leading social activity with 38% for 77% of respondents who stated their involvement in events including social activities in the last 3 months. This activity is followed by going to the movies with 35%, watching movies with friends at home with 29%. It is useful to emphasize these figures, which underline that the difficulty of getting out of a narrow social environment as well as the limits drawn by the respondents. Only 2% of respondents stated that they participated in volunteering activities.

As a response to the virtual reality games that we aim to design, the rate of those who prefer games as a means of socialization is 19%. However, it should not be forgotten that these rates reflect the responses of those who have partaken in social activities in the last 3 months. It is worth noting that a target group of 23% has not performed any social activities in the last 3 months.

4.2. Determining the Target Audience

It is important to determine the target audience for the solutions that will be designed for the designated problem because knowing which age range should be addressed will determine the scope, the educational status will determine the ways of delivery, employment status will determine the

amount of time that will be allocated while the income levels will determine their budget for the content / solution designed within the project.

Knowing your target audience will allow you to customize the solution to respond to real life obstacles. Thus, instead of solving the short-term problems one can solve the root of the problems in the long term.

The demographics that should be taken into consideration in studies regarding the empowerment of the youth with SCIs, their inclusion to social life and becoming self-sufficient people are presented below:

- 78% of the respondents are between the ages of 16-30.
- 53% of the respondents are high school graduates.
- 35% of the respondents are unemployed.
- 77% of the respondents do not have professional experience.
- 78% of the respondents have a monthly income of less than 500 EUR.

You can examine the "Research Results and Findings" section to see the detailed demographic status.

4.3. Application and Verification of the Generated Solution

The conducted research and obtained data are important in terms of giving an idea of where to start solving the problems. These ideas are an assumption / prediction. The accuracy of these predictions should be tested by asking individual questions to the target audience.

After the one-on-one interviews conducted, solutions emerged for the problems that were tested for validity. Among the answers given by the participants, approximately 50% of the youth SCIs stated that they needed to develop their personal skills as well as their self-confidence and professional development, according to their answers regarding their needs to become active individuals. This indicates that they have not been able to receive a healthy education throughout their life and they have difficulty in communicating with the outside world. Entertainment and games were preferred answers given to help overcome this problem. Entertainment and games as non-formal education incorporate a systematic which prioritizes first-hand experimenting and experiencing of participants.

The two solutions, "Virtual Reality Sports Games" and "Social Inclusion Training Program," designed within the scope of our project directly respond to these needs. Considering that the designed games can be played alone or used within the social inclusion program, a holistic solution framework is presented. Along with the tests to be carried out with the participants, solution suggestions and verification of the designed products will be completed. These tests are to see if the product / service produced for the target group serves its purpose.

With the feedback we received during the training sessions with the groups, the shortcomings of the solution produced will be developed and finalized. Implementation of the idea and getting feedback will take place more than once.

The specified games and training programs will be available at www.vr4inclusion.org.

4.4. Construction of Assessment and Evaluation

It is just as important to track whether the solution produced serves its purpose as producing a solution to the existing problem. Performing the measurement and evaluation is crucial to see if the created solution is serving the goals of your project and it will strengthen your hand in explaining the effect of your solution to the stakeholders.

You can follow / measure the following topics in terms of constructing the measurement and evaluation of your project:

- Contribution to the awareness of the problem you are trying to solve,
- Contribution to the change of the problem you are trying to solve,
- The changes in the target audience after your solution
- The number of people you have reached,
- The demographic of the audience you have reached.

4.5. Dissemination of the Outputs

There are three important things one needs to do after identifying the problem, determining the target audience and implementing the designed solution. These are; carrying out communication studies for the implementation of the solution, developing collaborations for the implementation to the target audience and finding the financial support / investment to carry out communication studies to expand the solution.

Communication: If the solution produced reaches more people, it means the social impact will be larger. Aside from doing your job well and effectively, to increase social impact, one should spend some of the time telling other people about the work. Communication activities will be done by contacting the following stakeholders.

- Printed media such as newspapers, magazines
- Radio and television
- Digital communication (social media such as online broadcasts, blogs, YouTube channels)
- Mail groups of associations or organizations are communicated through
- Schools
- Health centers

Implementation and cooperation: In order to rapidly deliver the produced products and services to the target audience, dissemination will be made through the institutions already working in this field. In this context, the following stakeholders are important for implementation and cooperation.

- Schools
- Social initiatives
- Civil society organizations
- Health centers
- Public institutions

www.vr4inclusion.org

Investment / Financial support: There is a need for investment or financial support to expand the content and scope of products and services designed in medium and long term. In this context, the following institutions are important stakeholders in terms of the financial sustainability of the project.

- **Incubation Centers:** One can apply to develop an idea, determine a business model and get guidance from experts in the field.
- **Angel Investment Networks:** One can apply to access the finance required to expand the scale of the project and design new products / services.
- **Crowdfunding:** One can use it to get financial support from individuals who are usually in the idea phase and to cover their investment costs.
- **Funds:** Financial support given in a certain area / purpose.
- **Joint Project Development:** You can associate your own or existing ideas with their corporate social responsibility or sustainability projects upon the demands of the institutions.

At this point, our project, in line with this report, aims to spread the perspective that the disability is a collective problem of the society rather than the individual, within the framework of the United Nations "Convention on the Protection of the Rights of Persons with Disabilities" accepted in 2006 The study contributes to the efforts from caretaking and financial policies for persons with disabilities to removing the barriers regarding human rights and social equality. The development of self-sufficient individuals who have equal rights with everyone, rather than individuals who are dependent on others, in need of help, is important to us. In the content to be produced, the prejudices of the society and the youth's withdrawal due to these prejudices is taken into consideration rather than the disabilities. An attempt is made to seek answers to requests such as a desire to live independently or a participation request through sports and inclusion activities. These efforts also contribute to the 2030 UN Sustainable Development Goals and the 2020 European Disability Strategy.