WP3: Study on existing courses offered in the Health and Social Care Sector

Study reports on existing practices for new technologies courses in the health and social care domain

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WP3 Partners' and Logos

Sillogos goneon ke kidemonon atomon me anapiria To ERGASTIRI (Greece)

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NATIONAL UNIVERSITY OF IRELAND GALWAY (NUIG, Ireland)

FRANKFURT UNIVERSITY OF APPLIED SCIENCES (FRA-UAS, Germany)

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1. Task 3.1 Survey on current offer

DDskills project aims at developing an Alliance for providing new knowledge, skills, and competences for professionals supporting persons with disabilities. The rapid technological advances of the past decades have also triggered the progress in technology usage for assistive and training purposes. With the aim of strengthening the educational curricula of health professionals, DDSkills project will amplify Care V.E.T units, by delivering an extended curriculum covering a broad group of digital skills in the disability domain and emerging technologies.

As the first step for the development of DDskills curriculum, Work Package (WP) 3 main aims are to identify and evaluate existing practice for Digital Skills courses in the health and social care domain.

Indeed, Task 3.1 (Survey on current offer) includes the following objectives:

1) To identify digital skills courses for the Health and Social Care Sector Report (Session 2).

To reach this aim, Partners involved in the WP3 performed a web research investigating the availability and the characteristics of the digital skills courses for each country. Session 2 reports the results of this research.

2) To analyze Digital Skills demands among healthcare professionals working with people with disabilities and mental health problems.

To reach this aim, the Partners involved in the WP3 conducted a survey/focus group including health professionals working with persons with a range of disabilities, aiming at drawing a picture of the multidisciplinary team's knowledge of digital skills and at identifying their needs (in terms of characteristics of training courses). Session 3 reports the results.

3) To identify international MOOC and e-learning institutions providing digital skills training courses and certifications for the health and social care sector.

To reach this aim, Partners performed a cooperative web search. Results are reported in Session 3.

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1. Identify digital skill courses for Health and Social Care Sector Report

a. Methods

To investigate the availability and the characteristics of the digital skills courses for Health and Social Care Sector for each of the six countries involved in WP3, FSL (Italy), ERGASTIRI (Greece), MMC (Cyprus), FrankfurtUAS (Germany), NUIG (Ireland), and JDC (Lithuania) conducted a web research to identify the digital skills courses available in their countries.

All Partners collaborated in identifying the keywords to be used to perform the search in terms of *i) Digital Skills* taught in the courses selected, *ii) professionals (*included in the multidisciplinary team) whom the course is addressed to, and *iii) population* in terms of types of disabilities which the professionals attending the course will work on (*Table 1*).

Inclusion criteria: courses had to be certified and held in the last 3 years (2017-2020).

Digital Skills	**Professionals (Mutidisciplinary team)**	**Population (persons in needs)**
Robotics	Occupational therapists	Intellectual Disability
Virtual Reality (VR) / Augmented Reality (AR)	Psychologists	Cognitive Disability
Smart Home	Social Workers	Mental Health Disorders
Ambient Assisted Living (AAL)	Special Education Teachers	Functional Loss
eHealth	Nurses	Old Aged
Assistive Technology/ Devices (AT)	Gerontologists	Motor Disability
Augmentative and Alternative Communication (AAC)	Speech and Language Therapists	

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Brain-Computer Interface (BCI)	Physical Therapists	
Telemedicine	Curative Educators	
Sensors	Social Pedagoges	
	Dieticians	
	Technicians	
	Physiotherapists	
	Social Care workers	
	Medical doctors	

Table 1. Keywords used for the web research

b. Data analysis

We performed a descriptive analysis with data collected for each country. Average, standard deviation, maximum and minimum values were computed for the duration and costs of the courses. We calculated the frequency of the learning modality (online, face-to-face, and blended) and the language of the courses (e.g. Italian, German, Greek, and so on). Furthermore, we analyzed the frequency of each digital skill taught, the end-user's profession (multidisciplinary team), and the type of disability, based on the list of the predefined keywords.

Furthermore, data collected by the six groups were analyzed together by performing the same analysis for all of them, in order to obtain an overall picture of the results.

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c. Results

i. Digital skills courses available in Italy

The search on training courses focused on digital skills available in Italy resulted in 18 courses, all held in Italian language. Twelve of them were delivered in the "face to face" modality, five in the online modality, and one was delivered in the blended learning one. The mean duration of the courses was 78 hours (±126.3 hours), with a maximum of 500 hours (i.e. a one-year master's degree program), and a minimum of 5 hours, referred to a single module course (one day). Thirteen out of 18 courses had Continuing Medical Education (CME) accreditation, one gave a European Qualifications Framework (EQF4) qualification, while for three courses the qualification was not specified.

Private Universities organized three courses, while a Public University organized one course. Other courses were delivered by Public Institutions, Assistive Technology (AT) Centers, AT Associations, and no-profit Institutions. The cost of a course was, on average, 774 euros (±690 euros; min 80 euros, max 220 euros), even though the costs of six courses were not reported.

Figure 1 shows (in term of frequency) the topics reported in the description of the courses: all of them were related to AT (100%), one included Brain-Computer Interface (BCI) (5.6%), 3 courses included Augmentative and Alternative Communication (AAC) (16.67%), 5 ambient assisted living (AAL) (27.8%), 5 smart home (27.8%), and 1 robotic (5.6%). We did not find courses related to eHealth, Virtual Reality (VR), Telemedicine, and sensors (for environment and users monitoring).

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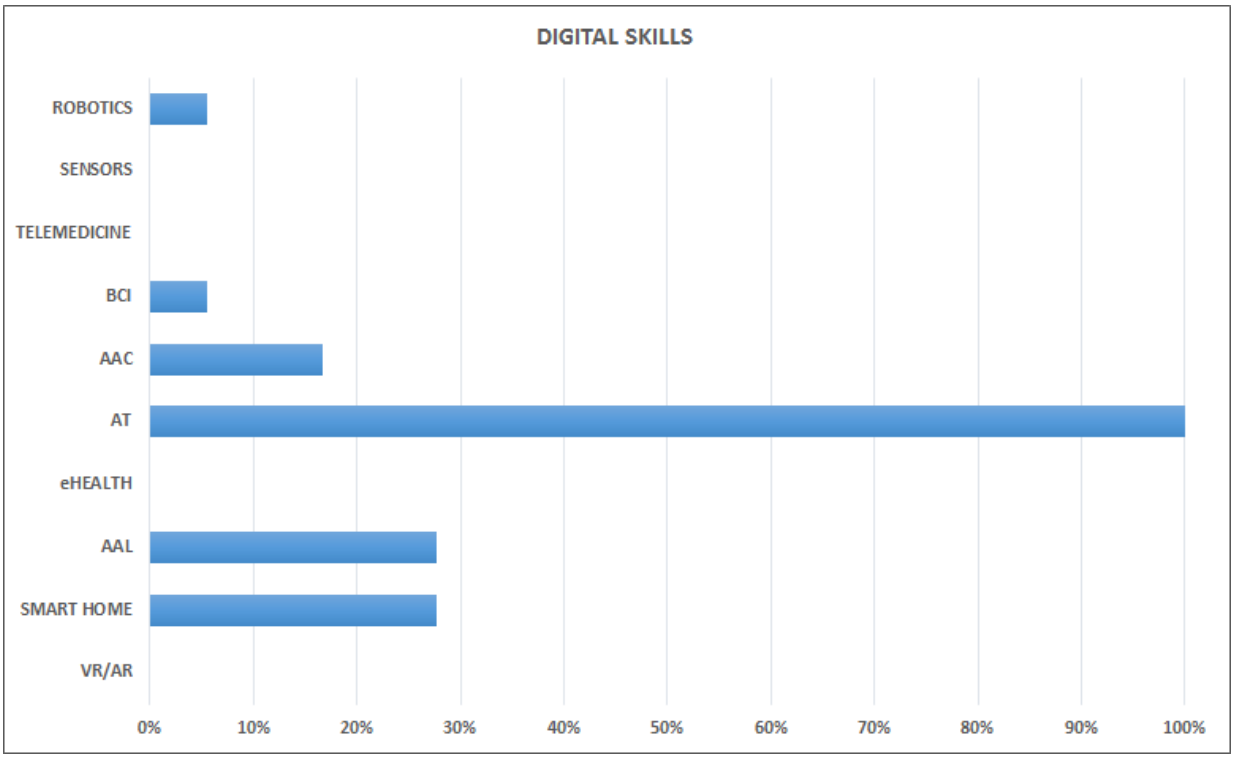

Figure 1. Digital skills taught in the courses in Italy

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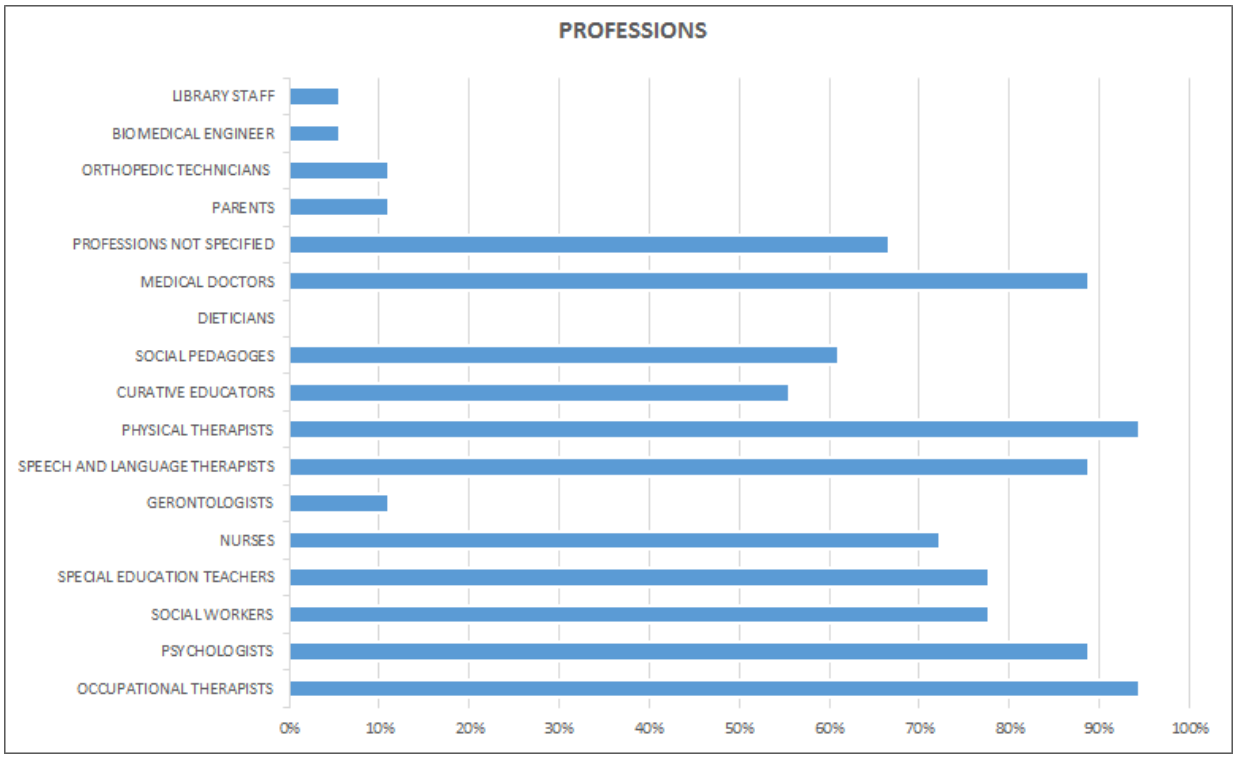

Figure 2. Professionals whom the course is addressed to (Italy).

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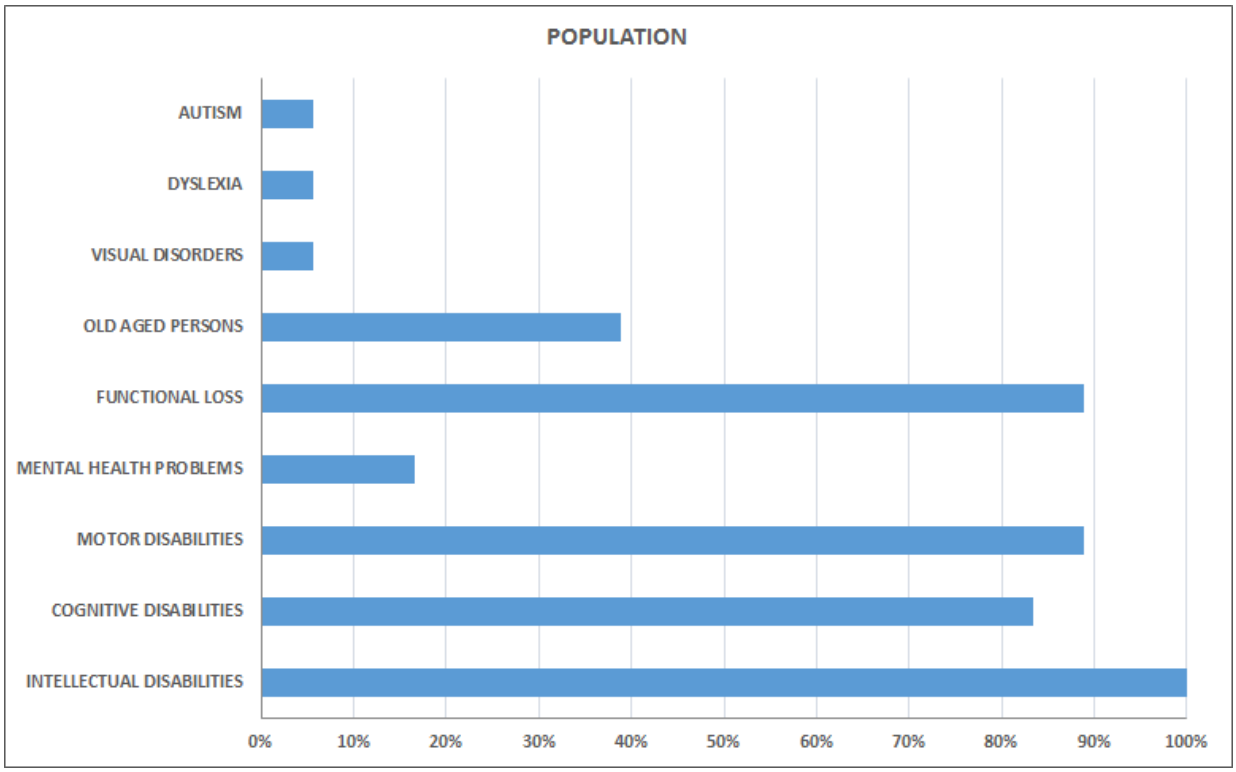

Figure 3. Types of disabilities which the professionals attending the course would work on (Italy)

Figure 2 shows the percentage of professionals whom the course is addressed to, revealing that all courses included more than 1 figure (Min=6; max=12). Seventeen courses were addressed to occupational therapists (94.4%), sixteen courses to psychologists (88.9%), fourteen to social workers (77.8%), fourteen to special education teachers (77.78%), thirteen to nurses (72.22%), two to gerontologists (11.11%), sixteen to speech and language therapists (88.9%), sixteen were for physical therapists (88.89%), twelve for curative educators (55.6%), eleven for social pedagogues (61.11%) and sixteen for medical doctors (88.89%). Six courses also included parents of people with disabilities (N=2), orthopedic technicians (N=2) and other technicians working in the field of prostheses and aids (N=2), Biomedical engineer (N=1) and Library staff working with AT (N=1). We did not find any course including dieticians as profession.

Results regarding the types of disabilities which the topics of the courses were related to (*Figure 3*) showed that all courses (N=18) taught Digital Skills to work with people with intellectual disabilities (100%), fifteen of them included people with cognitive disabilities (83.3%), sixteen also listed people with motor disabilities (88.89%) and three included mental health problems (16.7%). Sixteen courses were focused

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on people with functional loss (mobility, communication, self-care), and ten on the old aged persons (40%). Two course reported "other" disabilities (11.1%): one aimed at people with visual disorders and dyslexia, the other at autism.

ii. Digital skill courses available in Germany

The search on digital skills courses available in Germany resulted in a total of 25 courses, all held in German language. Sixteen courses were delivered in the "face to face" modality, six were online training courses (one could be attended in both modalities), and three were delivered in blended learning modality. One course consisted of and five others included a different modality such as self-studies and final exams. The courses lasted, on average, 40 hours (± 91.4 hours), with a maximum of 300 hours and a minimum of 2. Six courses were held by public universities, ten by private institutes, two by the German Association of Augmented and Alternative Communication, four by an association for people with disabilities, one by a research network, two by a publisher, and one by the Medical Chamber. The average cost of the courses was 750 euros (±1206.96 euros; min 50. euros, max 4500. euros). The price was not reported for only one course.

Figure 4 shows the frequency of the topics reported in the description of the courses. Sixteen courses were described as related to AT (64%), one to BCI (4%), ten to AAC (40%), four to AAL (16%), three to smart home (12%), eight courses were related to eHealth (32%) and eight to telemedicine (32%) and two (8%) to others [e.g. smart device, artificial intelligence, Information Technology (IT) systems, databases]. No courses were related to VR or robotics.

Courses issued different kind of certificates, such as University certificates (five courses), European Credit Transfer and Accumulation System (ECTS) (four courses), and FP (Fortbildungspunkte = ongoing education points) certificates (nine courses). Three courses issued certificates for advanced studies. Three courses did not mention any certificate, while four did not specify them.

Professionals listed as end-users of the courses are reported in *Figure 5*. Twelve courses were for occupational therapists (48.8%), two courses were for psychologists (8%), one for social workers (4%), four for special education teachers (16%), eleven for nurses (44%), three for gerontologists (12%), ten for speech and language therapists (40%), nine for physical therapists (88.89%), four for curative educators (16%), five for social pedagogues (20%), one for dieticians, nine for medical doctors (36%). Six courses included other professions which were not specified (24%) and thirteen of them also included "other"

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professions, such as administrative staff (N=4), technical staff, journalists, medical consultants, health insurance (N=2), relatives of people with disabilities (N=3), biomedical engineer (N=1), Library staff working with AT (N=1), and every profession in health care who is interested in IT (N=1).

Data analysis of the population (e.g. old aged persons, people with motor disabilities, cognitive disabilities and so on) to which the topics of the courses were referred to (Figure 6) resulted in eleven courses teaching Digital Skills to work with people with intellectual disabilities (44%). Eleven of them delivered digital tools to work with people with cognitive disabilities (44%) and fifteen also listed people with motor disabilities (60%). Three courses were focused on people with functional loss (I.e. mobility, communication, self-care; 12%) and ten on old aged persons (40%). In ten courses (40%), the type of disability was not specified. No course included the definition of mental health problems.

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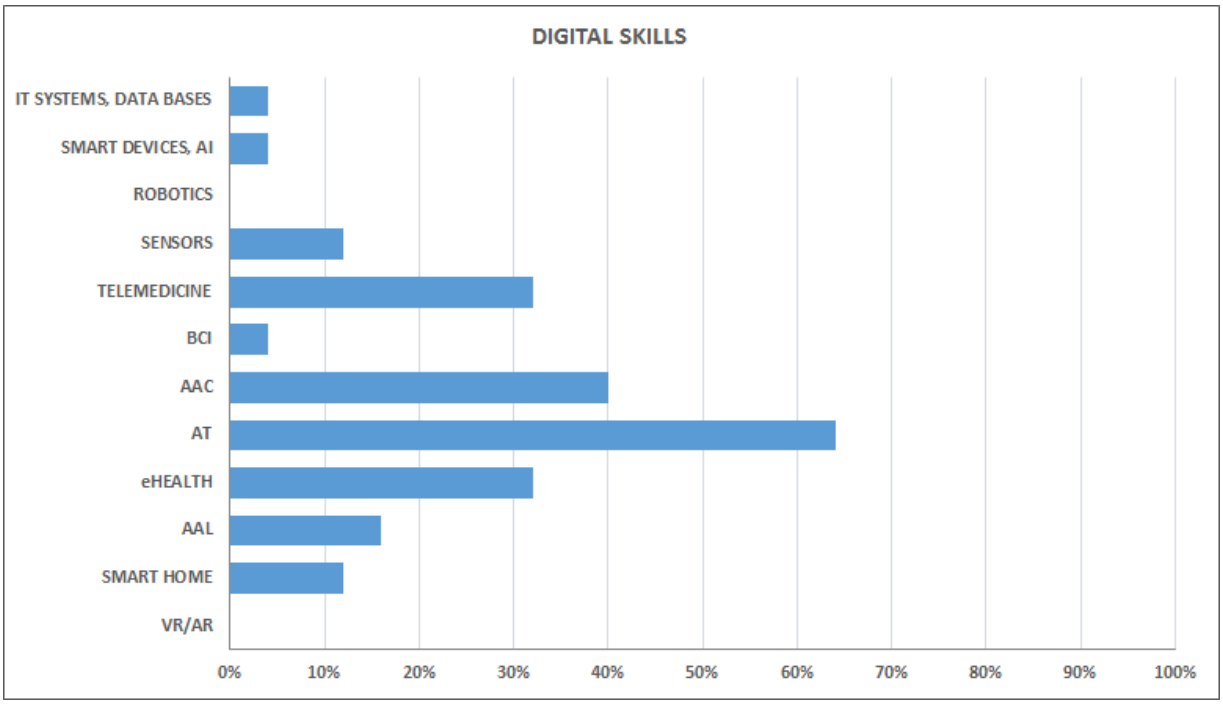

Figure 4. Digital skills taught in the courses in Germany.

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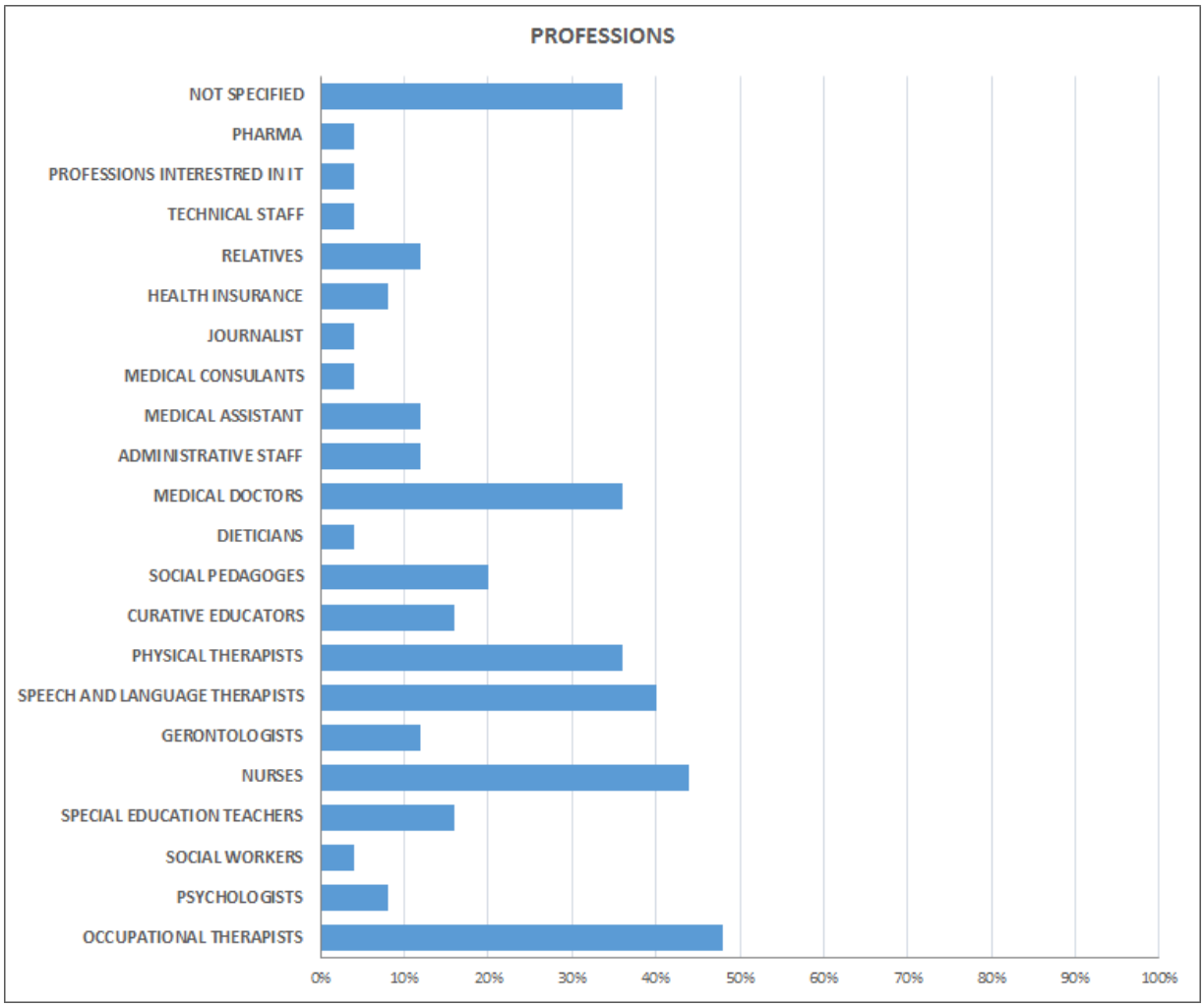

Figure 5. Professionals whom the course is addressed to (Germany).

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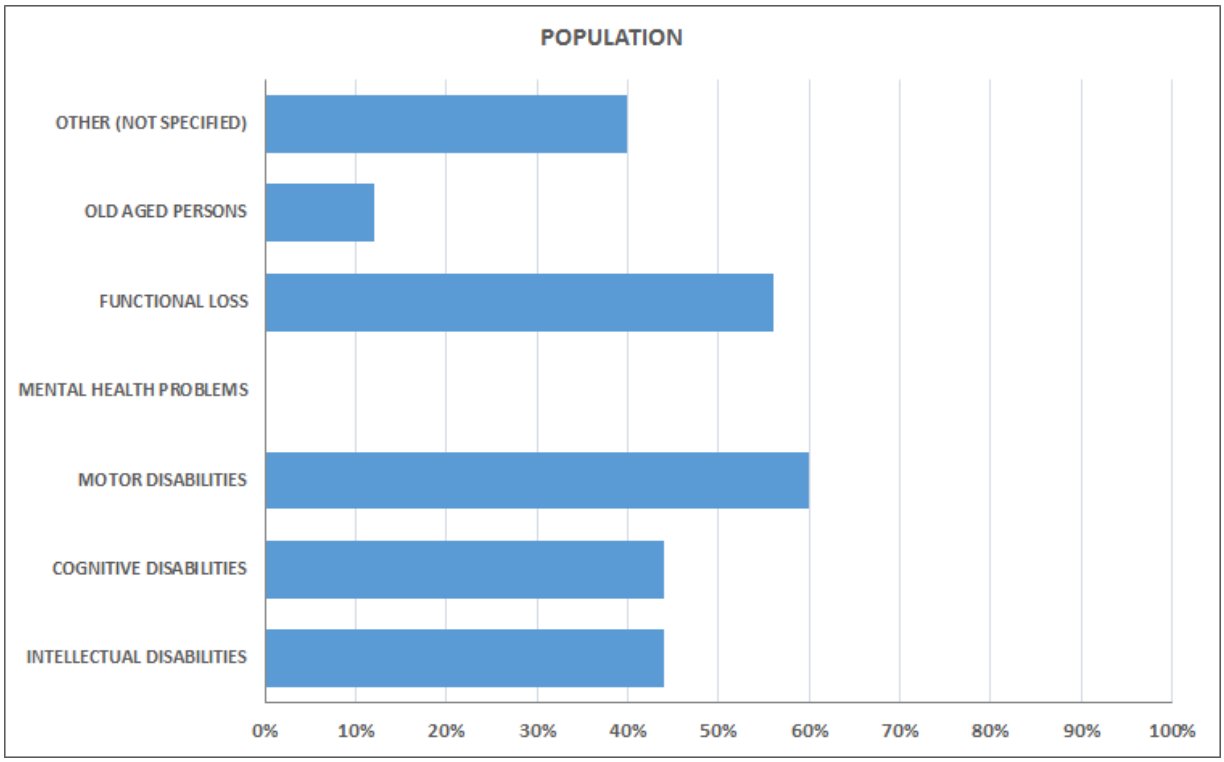

Figure 6. Types of disabilities which the professionals attending the course would work on (Germany).

iii. Digital skill courses available in Greece

The search on digital skills courses available in Greece resulted in nine courses. Seven were held in Greek language, while three in English. The average duration of the courses was 58,87 hours (±61,02 hours), with a maximum of 150 hours for both a certificate program in Telemedicine and Health Services, and in Development of independent living skills in students with special needs, and a minimum of 5 hours for a certificate program in New Technologies & Special Software in Special Education. Three courses were delivered by Public Universities, and the others by Private Institutions.

Two courses issued a University certificate, while one course ECTS because part of a master's degree. The average cost of the courses was 1.880 euros (±3017 euros; min 45 euros, max 9000 euros).

Figure 7 shows Digital Skills trained in the courses identified: three courses were related to AT (33.33%), 2 to VR/ Augmented Reality (22.22%) one to BCI (11.11%), one to AAC (11.11%), one to AAL (11.11%), and one to Telemedicine (11.11%). No course was related to eHealth.

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As for the kind of professionals the courses were designed for: Seven courses were for the profession not specified (77.78%) and 2 (22.22%) courses were referred as “other” professions, such as developers' programmers (N= 1) and developers engineers (N= 1). *Figure 8* displays type of disabilities to which the topics of the courses were related. One course taught Digital Skills aimed at people with Functional loss (mobility, communication, self-care; 11.11%), eight (88.89%) at people with “other” disease (e.g. neurobiological disorders).

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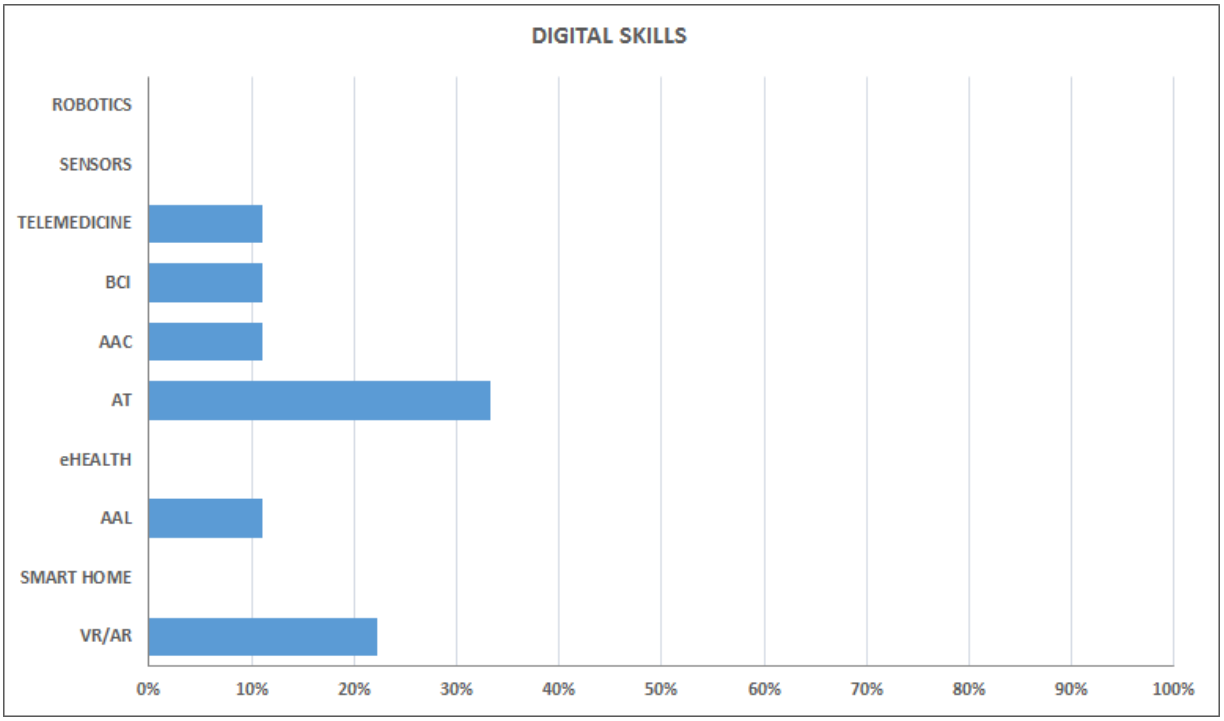

Figure 7. Digital skills taught in the courses in Greece.

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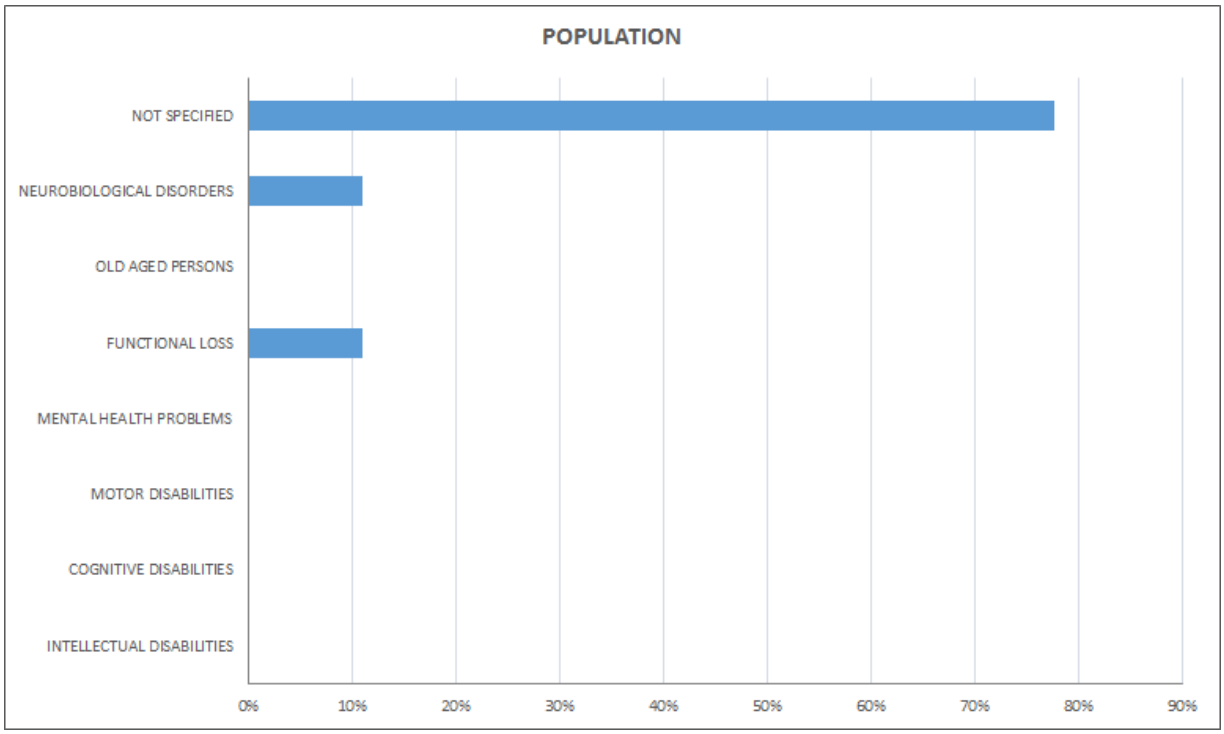

Figure 8. Types of disabilities which the professionals attending the course would work on (Greece).

iv. Digital skill courses available in Ireland

The search on digital skills courses held in Ireland resulted in 20 courses, all of them were held in English language. Three courses were delivered in the "face to face" modality, 13 were online training courses, and four were delivered in the blended learning modality. The average duration of the courses was 22 hours (±36,09 hours), with a maximum of 100 hours (Foundations in Assistive Technology course) and a minimum of 1 hour for VR and Apps Therapy Course.

Ten out of 20 courses were organized by Private Institutes, three by Public Universities, and three by Public Institutes. One course was organized by Ireland's national sight loss agency, two by organisation/associations for people with disabilities and one was by a media publishing company. The average cost of the courses was 379 euros (±580,73 euros; min 0 euros, max 1900 euros).

Figure 9 shows the frequency of each Digital Skills trained in the courses identified. Eight courses were related to AT (40 %), five to VR/ Augmented Reality (25%), one to Smart Home (5%), one to eHealth (5%), one to BCI (5%), two to AAC (10.00%), and two to Telemedicine (10.00%). No courses were related to AAL and to Sensors (for environment and end-users monitoring).

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Two courses issued a University certification, two a Continuing Professional Development (CPD), one an APA CPD certification and two a National Framework of Qualifications *(NFQ)* (level 6 and 7). Three gave a Continuing Education Units (CEUs) certification and 3 a Certified Healthcare Emergency Professional (CHEP) one. For the other courses left, the kind of certifications issued was not specified.

Figure 10 shows the frequency each professional figure is listed as participant of the selected courses. Three courses were tailored for psychologists (15%), one for social workers (5%), four were for special education teachers (20%), one for nurses (5.%), one for Speech and Language therapists (5.%), two for physical therapists (10%), two for medical doctors (10%). Seven courses did not specify the kind of profession (35%), and for courses (20.00%) included "other" professions as follows: "Healthcare Administration, education, tourism, health, advertising, manufacturing, telecommunications, real-estate, human-machine interaction, and robotics, Educational Therapists, Learning Specialists, Palliative care clinicians, mid/senior executives, program leaders, chief medical officers"

Results regarding the type of disability to which the topics of the courses were related (*Figure 11*) displayed that two courses taught Digital Skills tailored for people with intellectual disabilities (10%), two aimed at people with cognitive disabilities (10%), two at people with motor disabilities (10%), three at people with mental health problems (15%), and one at old age people (5%). Thirteen courses (65%) taught Digital Skill to work with people with other disabilities, such as students with learning and literacy difficulties (N= 3), individuals with a visual impairment (N= 1), young children with complex communication needs (N= 1), patients with complex health and pain management (N =1), not specified (N= 6).

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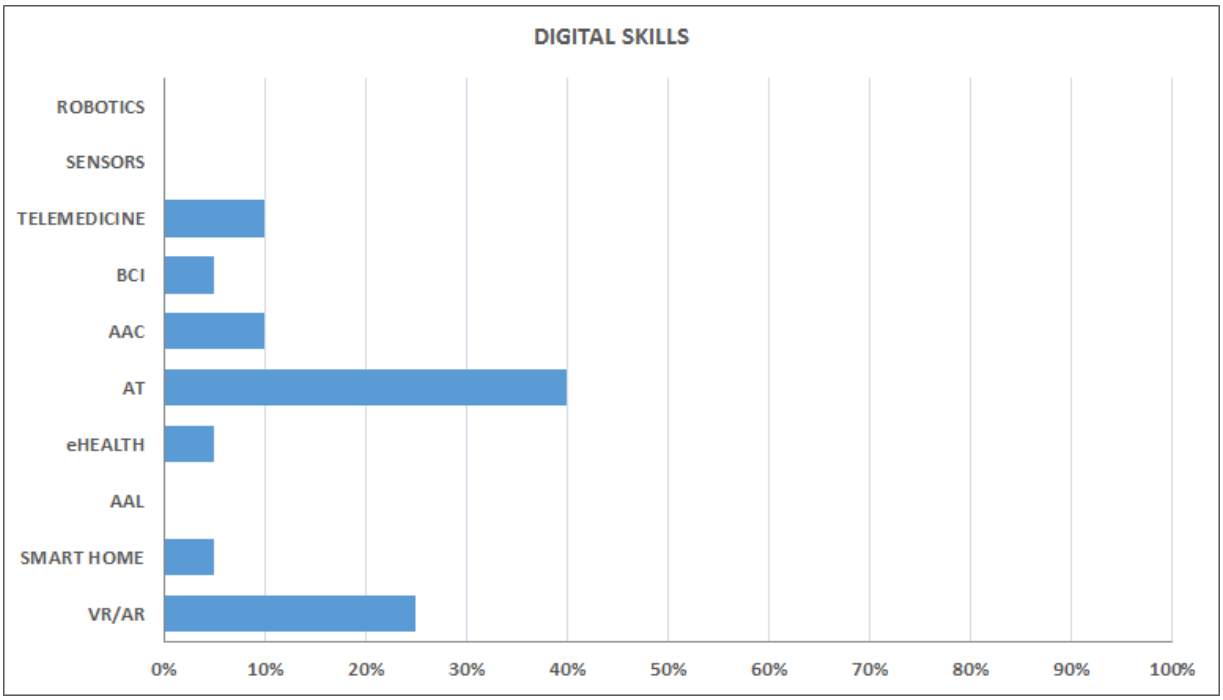

Figure 9. Digital skills taught in the courses in Ireland.

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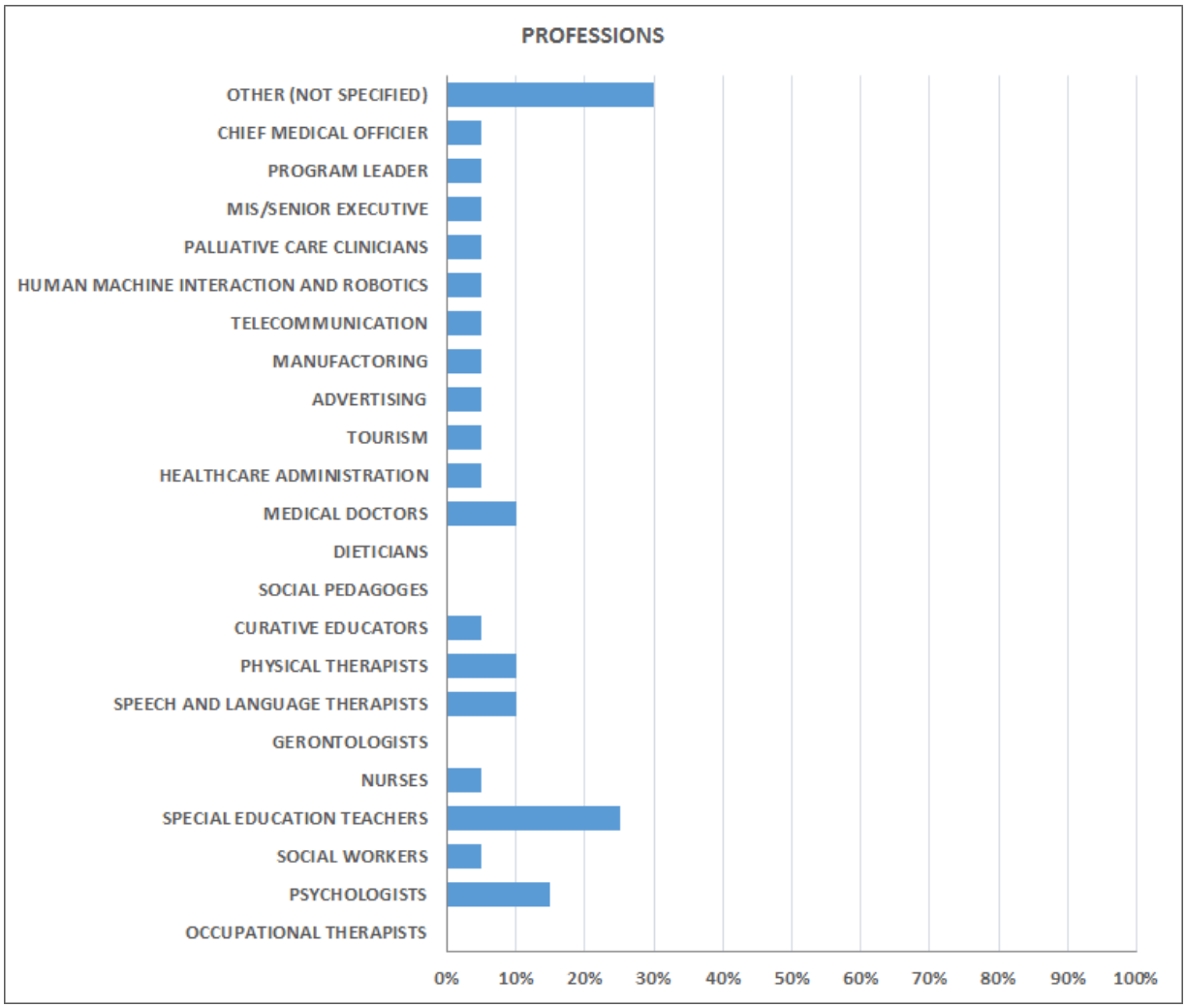

Figure 10 Professionals whom the course is addressed to (Ireland).

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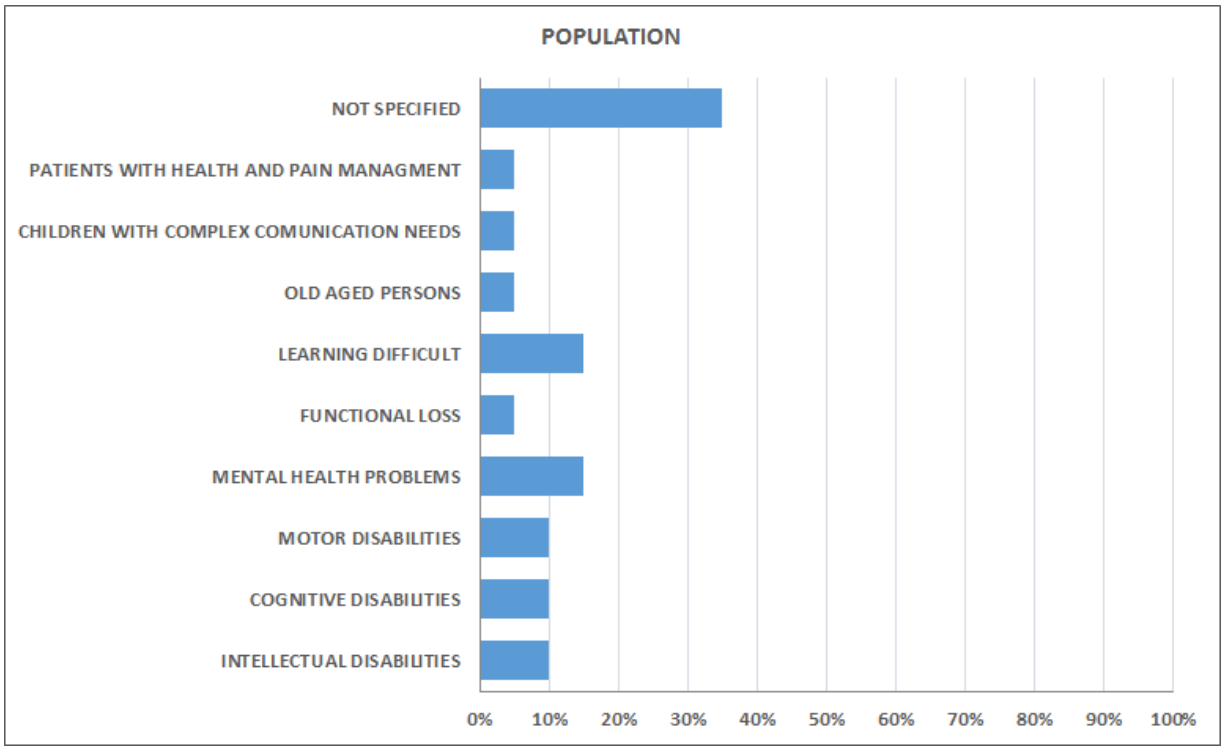

Figure 11. Types of disabilities which the professionals attending the course would work on (Ireland).

v. Digital skill courses available in Lithuania

The search on digital skills courses available in Lithuania resulted in 32 courses, all held in Lithuanian language and delivered in the "face to face" modality.

Most courses were designed for social workers (33,3%), while the others did not specify the professions included. Eleven courses (33.3%) taught Digital Skills aimed at people with intellectual disabilities, cognitive disabilities, motor disabilities, mental health problems, functional loss (mobility, communication, and self-care) and old aged persons. Nevertheless, in ten courses population was not specified (27.3%).

Regarding the list of digital skills, no one of the courses found matched the theme: all the programs increase overall IT literacy, but not the use of smart technology in social work.

vi. Digital skill courses available in Cyprus

Results obtained by the search performed in Cyprus resulted in 19 courses, 16 held in Greek language and 3 in English. Sixteen courses were delivered in the "face to face" modality and six were online training

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courses. The mean duration of the courses was 58.5 hours (±35,2 hours), with a maximum of 100 hours and a minimum of 14 hours. In thirteen courses duration was not specified in terms of hours, but it was indicated as semester within an official bachelor/master degree program. Ten out of 19 courses were organized by Public Universities and 4 by Private, 4 were organized by Private Institutes and one by a private company and Public University together. For the courses part of the bachelor/master, costs were not deductible by the total cost of the program. The average cost of the other courses was 450 euros (±299 euros; min 1.5 euros, max 600 euros), while costs of seven courses were not reported.

*Figure 12 s*hows the frequency of each topic reported in the description of the courses. Three courses were related to AT (15.79%), two to BCI (10.53%), one to AAC (5.26%), four to AAL (10.53%), two to Smart Home (10.53 %), 15 courses were related to E-Health (78.95%), 13 to Telemedicine (68.42%), three to VR/ Augmented Reality (15.79%) and one to Sensors (5.26%). Two courses (10.53%) were related to other digital skills (e.g. “Simulation in Healthcare”), and the other was not reported.

Most of the courses (M=14) were recognized in terms of European Credit System (ECTS) as part of a Master’s of a Bachelor’s degree; three courses issued an Attendance Certificate, approved by the human resource development and one a non-specified certificate.

Figure 13 indicates the frequency of professional figures considered as courses’ end-users. Two courses were addressed to occupational therapists (10.53%), four courses to psychologists (21.05%), three were for social workers (15.79%), one for special education teachers (5.26%), seven for nurses (36.84%), two for gerontologists (10.53%), two for speech and language therapists (10.53%), two for physical therapists (10.53%), one for dieticians (5.26%), one for medical doctors (5.26%). Thirteen courses were designed for “others” professions (68.42%): four of them for health scientists and informatics scientists, one for neuroscientists, biologists and cognitive scientists, one for electrical engineers, physicists, mechanical engineers, biochemists, one for health professionals (included professions involved in health administration and health economics included), one for biologists, pharmacists, radiation therapists, physical trainers/education instructors, four for health professionals and one for health professionals and caregivers.

Figure 14 shows the population (in terms of kind of disability) to which the courses’ topic were related to. One course taught Digital Skills to work with people with cognitive disabilities (5.26%), two with old aged persons (10.53%). In ten courses, the population was not reported. Sixteen courses (84.21%), touched the topic of Digital Skills addressed to “other” clinical populations, such as persons with communication

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disorders (N=1), physical, sensory and mental disabilities and learning difficulties (N= 1). In the description of 14 courses, the disability of the population was not specified.

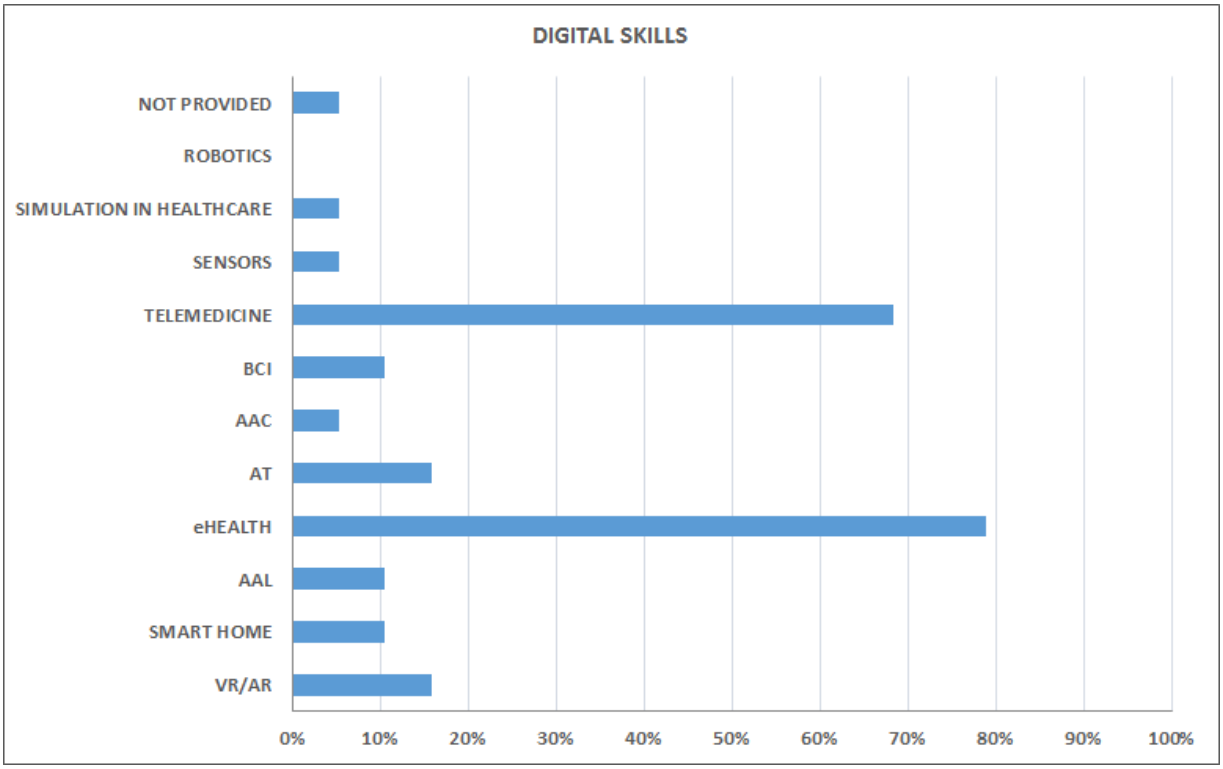

Figure 12. Digital skills taught in the courses in Cyprus.

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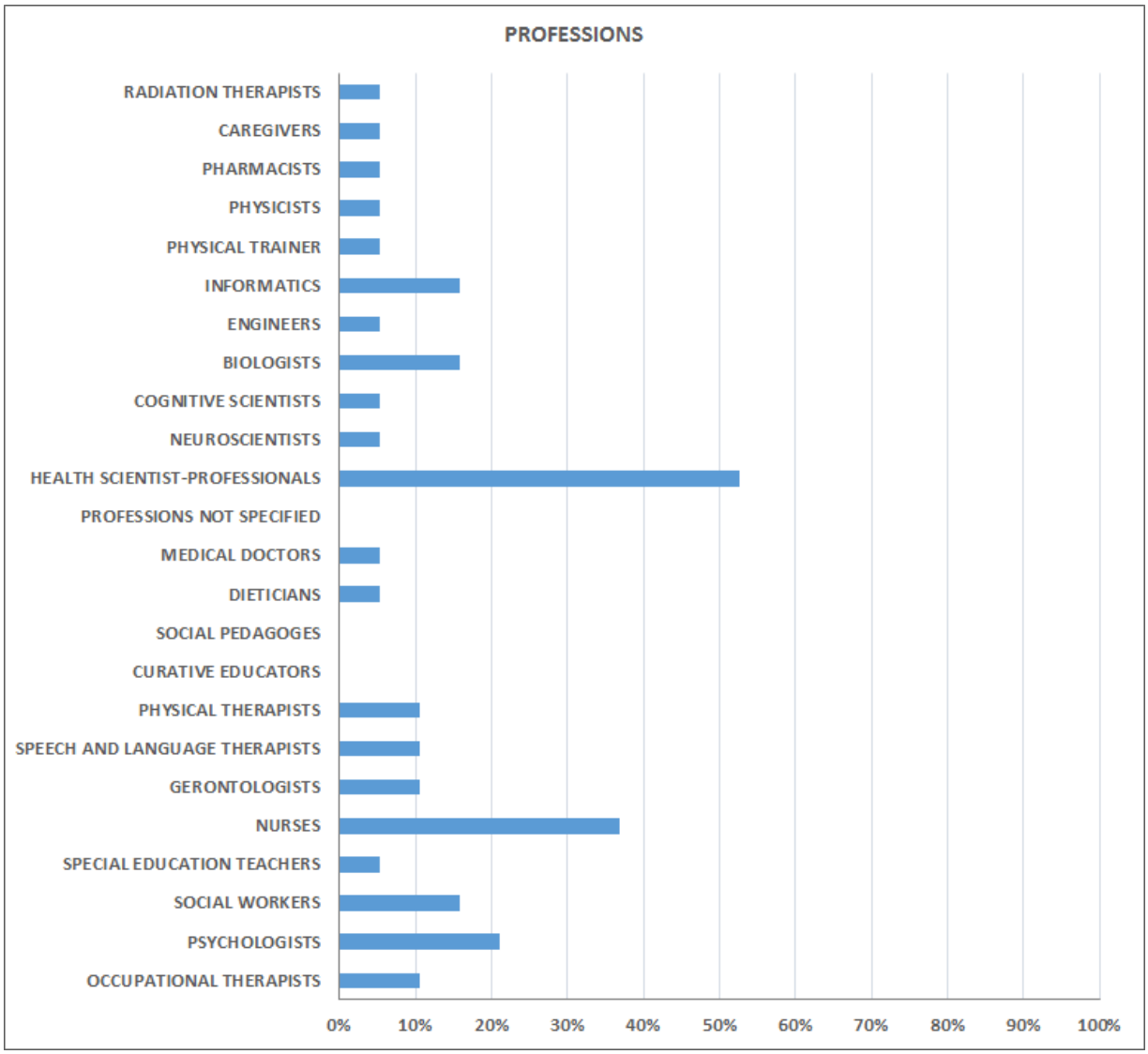

Figure 13. Professionals whom the course is addressed to (Cyprus).

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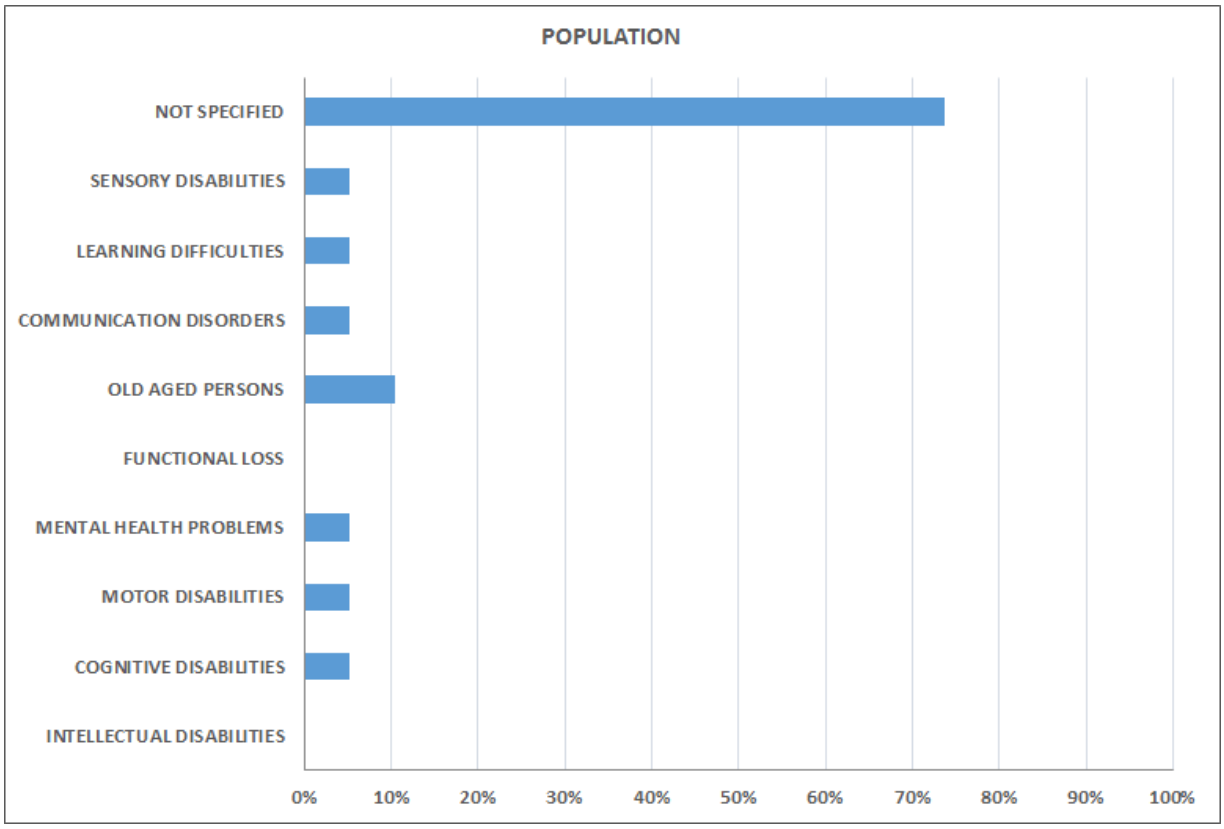

Figure 14. Types of disabilities which the professionals attending the course would work on (Cyprus).

vii. General results

Data collected by the six groups were analyzed together, to draw a whole picture of the results.

The research resulted in 91 courses overall: 32 delivered online, 52 in the "face to face" modality and 8 in the blended learning modality. The mean duration of the courses (when specified) was 50.5 hours (±92 hours) with a maximum of 500 hours and a minimum of 1 hours. *Table 2* show the frequency of each topic reported in the description of the courses, the frequency of professionals considered as coursers' end-users, and the population (i.e. people with different disabilities) to which the topics of the courses were focused on.

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		ITALY	GREECE	CYPRUS	GERMANY	IRELAND	TOTAL	FREQUENCY
Number of courses		18	9	19	25	20	91	
Duration (Hours)		70.1	58.9	58.5	40.8	22	50.06	
Organization	One Day	4	6	1	5	3	19	20.9%
	Intensive week	0	0	0	7	0	7	7.7%
	Weekends	4	0	0	2	1	7	7.7%
	Months	1	2	14	6	0	23	25.3%
	One day a week for some weeks	2	0	0	2	0	4	4.4%
	Other	6	2	4	5	15	32	35.2%
Modality	Online training course	6	3	4	6	13	32	35.2%
	Face to face training	13	5	16	15	3	52	57.1%
	Blended learning	0	1	0	3	4	8	8.8%
	Other (please specify)	0	0	0	6	0	6	6.6%
Digital Skills	Robotic	1	0	0	0	0	1	0.7%
	Virtual Reality / Augmented Reality	0	2	3	0	5	10	6.3%
	Smart Home	5	0	2	3	1	11	6.9%
	Ambient Assisted Living	5	1	2	4	0	12	7.4%
	eHealth	0	0	15	8	1	24	15.0%
	Assistive technology	18	3	3	16	8	48	29.8%
	Augmentative and alternative communication	3	1	1	10	2	17	10.5%
	Brain Computer Interface	1	1	2	1	1	6	2.9%
	Telemedicine	0	1	13	8	2	24	15.0%
	Sensors	0	0	1	3	0	4	2.5%
	Smart devices, AI	0	0	0	1	0	1	0.7%
	IT systems	0	0	0	1	0	1	0.7%
	Simulation in healthcare	0	0	1	0	0	1	0.7%
	Other (not specified)	0	0	1	0	0	1	0.7%
Professions	Occupational therapists	17	0	2	12	0	31	8.8%
	Psychologists	16	0	4	2	3	25	7.1%
	Social Workers	14	0	3	1	1	19	5.4%
	Special education teachers	14	0	1	4	5	24	6.8%
	Nurses	13	0	7	11	1	32	9.1%
	Gerontologists	2	0	2	3	0	7	2.0%
	Speech and Language Therapists	16	0	2	10	2	30	8.5%
	Physical Therapists	17	0	2	9	2	30	8.5%
	Curative Educators	10	0	0	4	1	15	4.3%
	Social Pedagoges	11	0	0	5	0	16	4.6%
	Dieticians	0	0	1	1	0	2	0.6%
	Medical Doctors	16	0	1	9	2	28	8.0%
	Profession not specified	12	7	0	9	6	34	9.7%
	Parents/Caregivers	2	0	1	3	0	6	1.7%
	Orthopedic technicians	2	0	0	0	0	2	0.6%
	Engineers	1	0	1	0	0	2	0.6%
	Library staff	1	0	0	0	0	1	0.2%
	Developers	0	2	0	0	0	2	0.6%
	Health Scientists and Professionals	0	0	10	3	1	14	4.0%
	Neuroscientists	0	0	1	0	0	1	0.3%
	Cognitive Scientist	0	0	1	0	0	1	0.3%
	Biologists	0	0	3	0	0	3	1.3%
	Informatics	0	0	3	0	0	3	0.8%
	Physical Trainer	0	0	1	0	0	1	0.3%
	Physicists	0	0	1	0	0	1	0.3%
	Pharmacists	0	0	1	1	0	2	0.6%
	Radiation Therapists	0	0	1	0	0	1	0.3%
	Medical Assistant	0	0	0	3	0	3	0.8%
	Medical Consultant	0	0	0	1	0	1	0.3%
	Journalist	0	0	0	1	0	1	0.3%
	Health Insurance	0	0	0	2	0	2	0.6%
	Technical Staff	0	0	0	1	0	1	0.3%
	Professions interested in IT	0	0	0	1	0	1	0.3%
	Tourism	0	0	0	0	1	1	0.3%
	Advertising	0	0	0	0	1	1	0.3%
	Manifactouring	0	0	0	0	1	1	0.3%
	Telecommunication	0	0	0	0	1	1	0.3%
	Human machine interaction and robotics	0	0	0	0	1	1	0.3%
	Palliative care clinicians	0	0	0	0	1	1	0.3%
	Mid/senior executive	0	0	0	0	1	1	0.3%
	Program leader	0	0	0	0	1	1	0.3%
	Chief Medical Officer	0	0	0	0	1	1	0.3%
Population	Intellectual disabilities	18	0	0	11	2	31	15.8%
	Cognitive disabilities	15	0	1	11	2	29	14.8%
	Motor disabilities	16	0	1	15	2	34	17.3%
	Mental health problems	3	0	1	0	3	7	3.6%
	Functional loss (mobility, communication, self care)	16	1	1	14	1	33	16.8%
	Old aged persons	7	0	2	3	1	13	6.6%
	Sensory Disabilities	1	0	1	0	0	2	1.0%
	Dyslexia	1	0	0	0	0	1	0.5%
	Learning difficulties	0	0	1	0	3	4	2.04%
	Neurobiological Disorders	0	1	0	0	0	1	0.5%
	Children with complex communication needs	0	0	0	0	1	1	0.5%
	Patients with Health and pain management	0	0	0	0	1	1	0.5%
	Autism	1	0	0	0	0	1	0.5%
	Not specified	0	7	14	10	7	38	19.4%

Table 2. Results for each country.

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d. Discussion

The characteristics of Digital Skill courses for the Health and Social Care sector vary across the countries represented by WP3 Partners in terms of topics, professionals whom the courses were addressed to, and the target population. No courses focused on this specific area were found in the search performed in Lithuania.

According to our results, most of the Countries offer courses covering most of the digital skills considered. Cyprus supplies at least one course for each digital skill. No courses about "Virtual and Augmented reality" were found within German courses selected.

The majority of the courses were described as focused on "AT" (52%), while the topic "eHealth" and "Telemedicine" were reported in 26.6% of them.

Most countries included different professions showing a m*ultidisciplinary approach* at the topic, while courses reported by Ireland were generally addressed to a specific professional category.

The population, considered as people with different disabilities and persons in need, was varied and heterogeneous, as can be seen from all the courses listed.

In conclusion, within the courses selected in this research, topics including sensors together with emerging technologies (VR, robotics, and BCI) are less frequent.

Results underline the need to providing new knowledge, skills, and competences for professionals supporting persons in need. Training courses would teach a range of different digital skills, and would be addressed to a multidisciplinary team.

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2. Analyze digital skills demands among healthcare professional

a. Methods

i. "Survey on digital skills' knowledge and on training needs of healthcare professionals working with people with disabilities and mental health problems"

DDskills Partners (FSL, FRA-UAS, JDC, and MMC) led a survey focused on identifying both social workers' training course needs and their knowledge on the use of technology aids that increase autonomy of people with disabilities and mental health problems.

For this purpose, we implemented a questionnaire named *Survey on digital skills' knowledge and on training needs of healthcare professionals working with people with disabilities and mental health problems* whose aim was to gain insight in current vocational trainings' practice and to assess the need for further education in the latest technologies, to improve the support for the above mentioned people.

Each Partner enrolled at least 10 social workers (i.e. occupational therapists, psychologists, nurses, gerontologists, speech therapists, physical therapists, medical doctors, special education teachers, social pedagogues, and curative educators), aged over 18 years.

The questionnaire was *self-report* and *anonymous* (all respondents have been de-identified), and the participation to the survey was *voluntar*y.

The survey provided socio-demographic information, like age-range, profession, length of time spent in social care overall, the client group/s the social worker has worked with (e.g., people with intellectual disabilities, etc). It consisted of 22 items and provided for both multiple choice and some open-ended questions, gathering all social workers' comments or suggestions, useful to assess their need for further education in the latest technologies.

The questionnaire was divided into 2 sessions. The first part (questions n. 1-15) was mainly focused on exploring both the social workers' expertise on digital skills/ technology aids and their opinion about the training in this field, whilst the second one (questions n. 16-22) investigated their views on how a training course on digital skills/technology aids should be organized, and on the characteristics it should have.

Three questions (i.e. n.2, n.18 and n.19) showed footnotes, in order to explain some definitions, such as "blended learning" or "flipped classroom", or to clarify the difference between "Ambient Assisted Living" and "Domotics".

The survey ended by asking the participants to indicate possible difficulties met in filling in it.

ii. Focus group

Focus Groups (FG) belong to the most common methods of data collection used in qualitative healthcare research, and they can be used to explore the views, experiences, beliefs and motivations of the participants. Questions are asked in an "interactive group" setting where participants are free to talk with

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other group members, and the discussion is directed by a moderator/leader, who attempts to create an atmosphere of trust and openness, and provides ground rules.

Two DDskills Partners (NUIG and to Ergastiri) conducted FG, in order to collect information about social workers' training course needs and their knowledge on the use of technology aids, aiming at increasing autonomy of people with disabilities and mental health problems. In particular, To Ergastiri led a FG on site, by recruiting 9 healthcare professionals, while NUIG conducted 2 online advisory panel meetings held via Microsoft Teams, with 10 participants (5 in each meeting).

In order to get comparable information collected with survey, we implemented a "Focus Group Script", followed by the leader to ask questions and moderate the discussion.

Before running the FG, the conductor welcomed the participants, introducing him/herself, and explained both purpose of the "group discussion" and its main rules. The "anonymous" and "confidential" nature of the FG was also pointed out.

The structure of the FG was the same of the survey, which is divided into 2 sessions (see above paragraph 3.a.i.). Consequently, during the first session questions about social workers' expertise on digital skills/ technology aids and their opinion on the training in this field were asked, whilst in the second part their opinions on how a training course on digital skills/technology aids should be organized were investigated. During the FG process, the moderator gave to the participants the possible answers' options, and took notes of their replies, encouraging them to provide any additional and useful information or opinion. Indeed, the procedure was to take one question at time, which was followed by a "follow-up question" (e.g. "Does anyone want to talk about that more?", "Does anyone want to add something else or make some comments?", "Does anyone have any other suggestion?", etc.) asked by the moderator, in order to facilitate the sharing of opinions and to get any further information.

The survey ended by asking the participants if they felt uncomfortable during the FG, and to indicate possible difficulties met in understanding questions.

b. Results

i. Digital skills demand among healthcare professional in Italy (FSL)

Methodical Design

The questionnaire was personally delivered to healthcare professionals working at Neurorehabilitation Hospital "Fondazione Santa Lucia" in Rome, who were chosen based on their clinical experience, and field of work. A psychologist explained the DDSkills project and the purpose of the questionnaire to all participants. Nineteen healthcare professionals were enrolled and filled in both the survey and the informed consent.

The questionnaire was administered from May 30th to June 10th 2020.

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Demographic Characteristics

*Age (*Figure 15*)*. Three persons were between 20 and 30 (15,79 %), four between 30 and 40 (21,05%), seven between 40 and 50 (36,84%), four between 50 and 60 (21,05%), and one over 60 years old (5,26%).

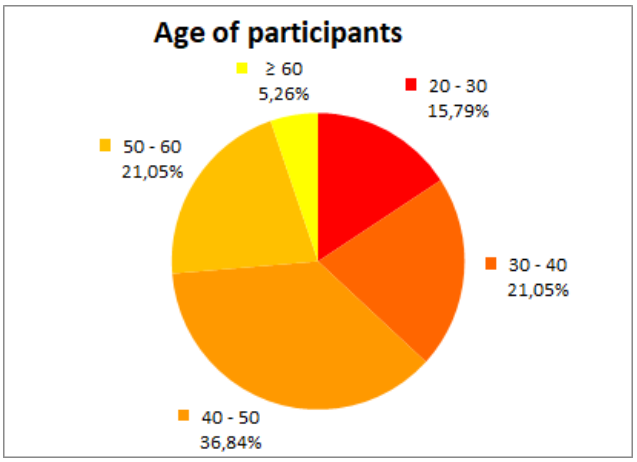

Figure 15: Age of participants.

Profession. Among the participants, nine were physiotherapists, two speech therapists, two cognitive therapists, one psychologist, one medical doctor (i.e. neurologist), three occupational therapists, and one neurodevelopmental disorders therapist (i.e. TNPEE).

Working field and client groups. Neurorehabilitation field. All participants are professionals working with neurological patients, such as persons with severe traumatic brain injury, spinal cord injury, multiple sclerosis as well as children with neurological conditions.

Results of the Survey

Based on the participants' answers and comments the results of the focus group are the following. Questions from 1 to 15 explored the social workers' expertise on digital skills/ technology aids and their training needs, whilst those from 16 to 22 investigated their views on how a training course on digital skills/technology aids should be organized, and the characteristics it should have.

1. *Do you usually use digital tools in your work?*

Fourteen (78%) out of the nineteen participants answered the question with "Yes", while four (22%) with "No" (Figure 16). One person did not answer the question.

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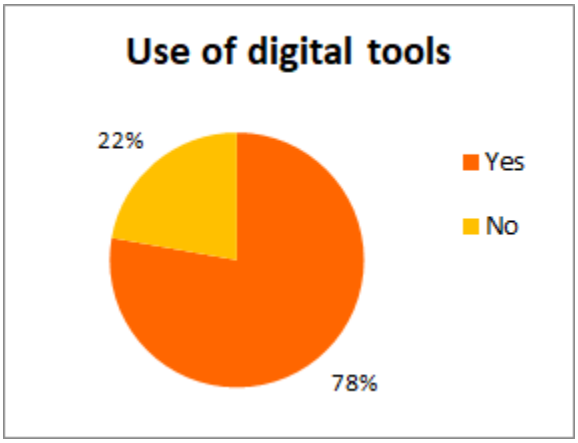

Figure 16. Use of digital tools.

2. *For whom answered YES to the previous question, what kinds of digital skills/ technology aids do you currently use in your workplace?*

Sixteen participants use digital devices, like tablets or computers. Four professionals use low tech assistive technology, while only one uses high tech assistive technology devices. Assistive technology software is used by four persons, and robotics by eight. One professional uses domotics, and another one Brain Computer Interface (Figure 17). The other items were not chosen (multiple answers possible).

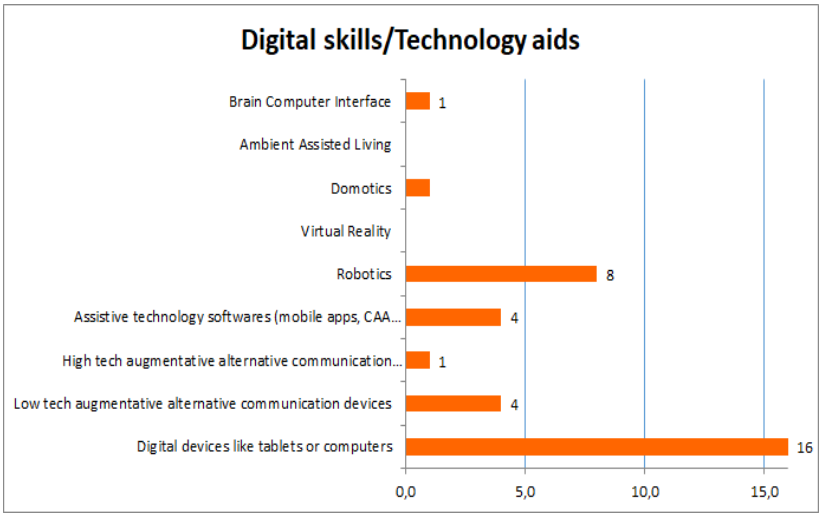

Figure 17: Kind of digital skills/technology aids used in workplace

3. *How effective do you rate technological tools for persons with disabilities or old aged, considered as elderly people and, more in general, persons in need?*

The question was rated was with “a lot” by seven participants (38,89%), “quite a lot” by eleven persons (61,11%) and “not much” by one person” (5,56%). “Not at all” was not chosen (Figure 18). One participant

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commented that it was important to assess the effectiveness of technological tools by distinguishing the type of deficit: for instance, between cognitive and motor disorder.

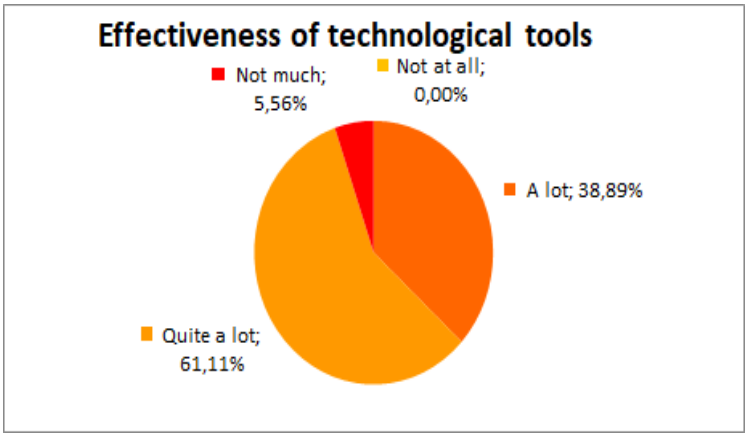

Figure 18: Effectiveness of technological tools

4. *Covid 19 has contributed to the implementation of more technology and digitization in the work process. Did you experience the same? in what kind of technologies?*

Eight (44, 44%) out of the nineteen participants worked remotely, while nine (50%) participants were involved in distance learning initiatives. Three (16,67%) said that telehealth was used between professionals and patients. Robotics was rated by only one person (5,56%). Five professionals commented that telerehabilitation was very important in in this crucial period of pandemic (multiple answers possible).

5. *Do you feel qualified to handle technology aids you work with?*

Thirteen out of the nineteen participants (68%) said they felt qualified to handle technology aids they work with, six answered with “no”.

6. *How confident do you feel with digital skills/technology aids?*

Participants voted with an average “6” on a scale of confidence with digital skills / technology aids from 0 to 10 (0=not at all, 10=completely). The range was from 1 to 10 (1x1, 1x2, 2x3, 1x4, 1x6, 5x7, 5x8, 2x9, 1x10).

7. *In your opinion, what are the main barriers to the use of digital technologies?*

The question was answered by eight persons (44,44%) with economic reasons, and by ten (55,56%) with lack of proper information technology (IT) education. Only one person did not answer the question, but

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commented that the type of disease, and age could be other possible barriers to the use of digital technologies (Figure 19).

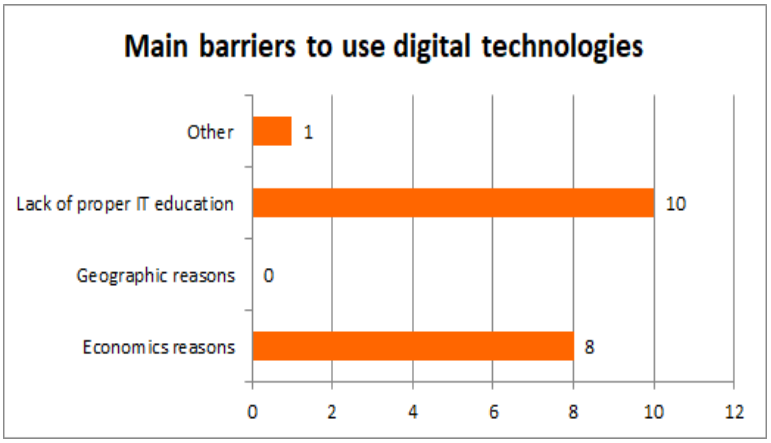

Figure 19: Main barriers to the use of digital technologies

8. *How many courses on digital skills/technology aids do you generally attend per year?*

Nine out of nineteen participants (47%) do not attend any training course on digital skills/technology aids (0) per year, eight persons (42%) said 1-2, while only two participants (11%) indicated 3-4 courses per year (Figure 20).

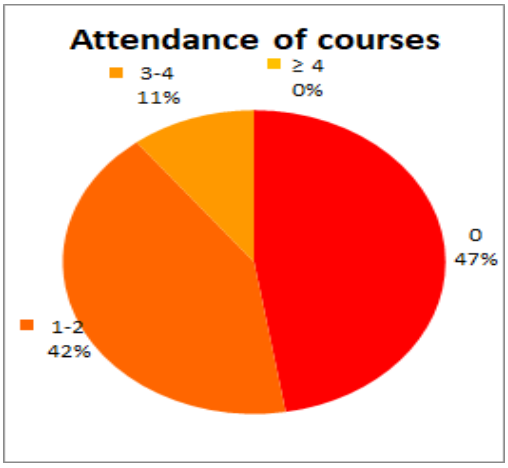

Figure 20: Courses attended per year.

9. *For whom answered "0", could you kindly explain why?*

As for reasons given for not attending courses, four participants (22,22%) cited the lack of time, three (16,67%) indicated the lack of interesting offered courses, and one participant (5,56%) mentioned that

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registration fees are too expensive. One person (5,56%) commented to be not informed enough about the training courses offered in the field (Figure 21).

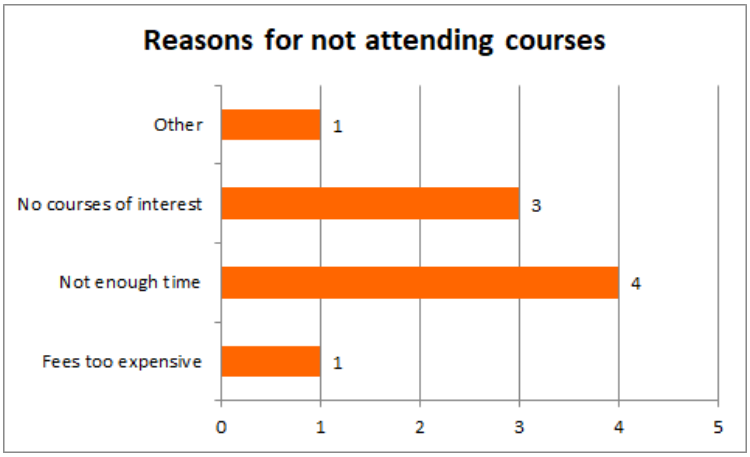

Figure 21. Reasons for not attending courses.

10. *Do you feel that more training about digital skills/technology aids is needed for social/ healthcare professionals?*

All participants (n=19) answered the question with "YES", undelining that more training about digital skills/technology aids is needed for social/ healthcare workers.

11. *Do you think it is necessary to have these skills taught in your workplace?*

All participants (n=19) answered the question with "YES", agreeing that it is necessary to have digital skill taught in the work place. Working fields as mentioned above: neurorehabilitation.

12. *How would the training about digital skills/technology aids impact on your ability to do your job?*

All participants (n=19) saw a positive impact of training about digital skills/technology aids on their ability to do their job (Figure 22): four said it would simplify or speed up daily activities (21%), fifteen (79%) replied that it would provide them with additional and better options for their job. The other items were not chosen (multiple answers possible). Two participants (10,5%) also commented that everything they learn over life can improves their skills, and job activities.

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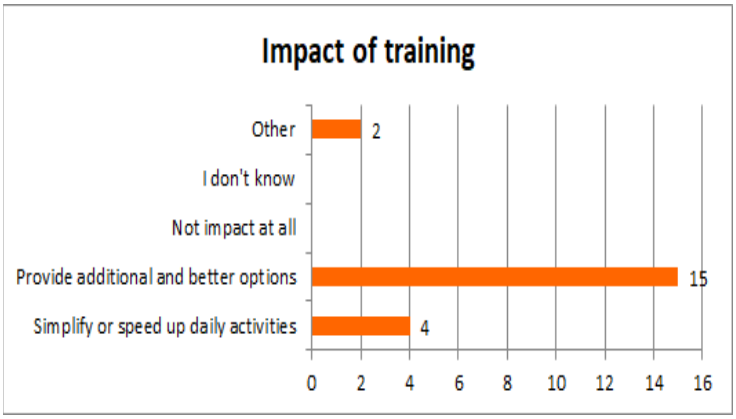

Figure 22: Impact of training on digital skills/technology aids

13. *What kind of digital skill do you think might be most effective for your job or you would like to learn/improve?*

Most of the participants (44%) considered "Virtual Reality" as the most effective digital skill to learn, followed by "Brain Computer Interface" (33%), "low tech assistive technology devices", such as switches, VOCAs, joystick, etc. (33%), and "high tech assistive technology devices" (e.g. eye-tracker) (33%). "Assistive technology software" (e.g. mobile Apps, AAC software, etc.) and "digital devices", like tablets or computers were indicated by five persons (28%), while four professionals (22%) chose "robotics" (multiple choices were available. Figure 23).

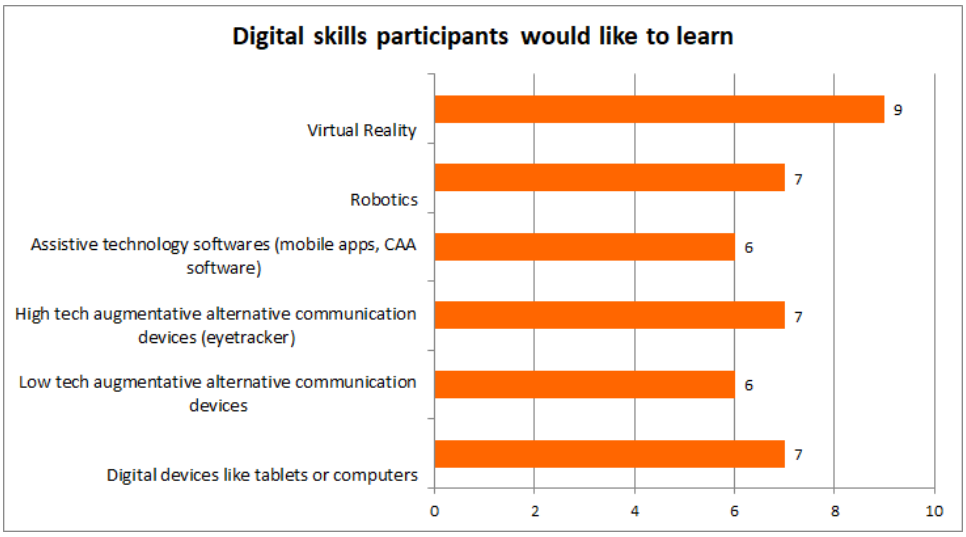

Figure 23: Digital skills considered as the most effective to learn.

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14. *Would you attend training workshops focused on digital skills/technology?*

All participants (n=19) replied positively, mentioning that they would like to attend training workshops focused on digital skills/technology.

15. *Would you like to be updated on training workshops news and events?*

All participants (n=19) confirmed they would like to be updated and notified on training workshops news and events.

16. *What would you evaluate as necessary to decide to join a training course focused on digital skills/technology aids?*

From the options provided to the participants, fifteen of them (83%) indicated the general course programme as the most important factor in their choice, followed by price (72%), topic of the course (66%), and availability of the technology within the workplace (39%). Six participants (33%) chose the course duration, while five (28%) out of nineteen sited the apparent expertise of the tutors (multiple answers possible. Figure 24).

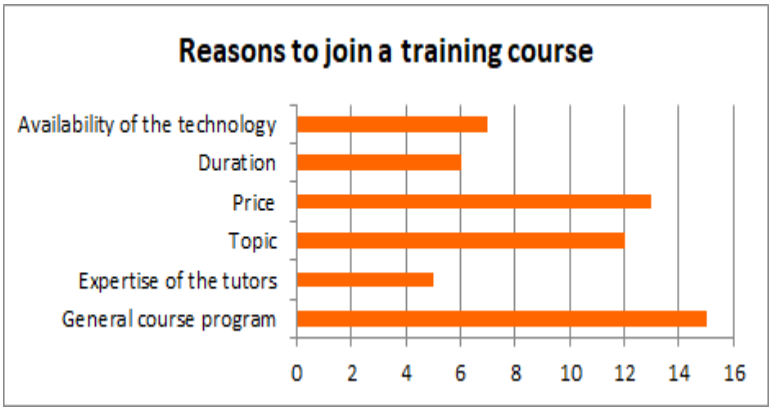

Figure 24: Reasons to join a training course

17. *How should the course be organized?*

Most of the participants (47%) indicated “only two days a month for some months”, while six of them (32%) expressed preference of “one day a week for some weeks”. Two participants (11%) voted for “some weekends within the same months”, and other two (10%) for “an intensive week” (Figure 25).

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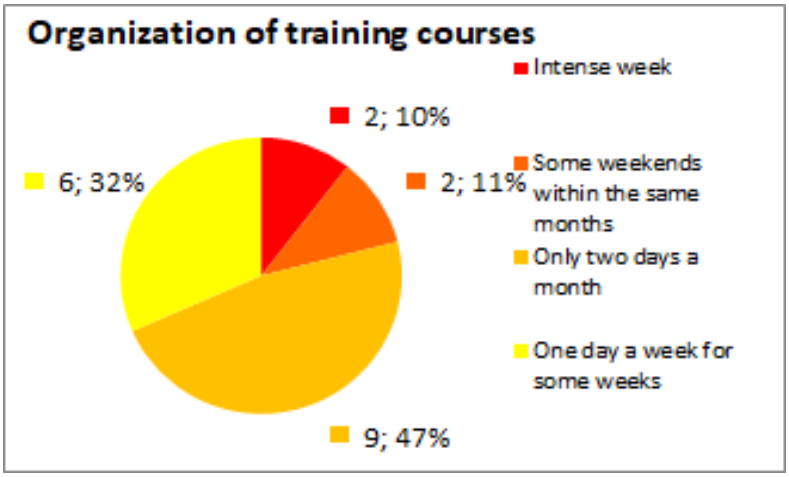

Figure 25: Organization of training courses

18. Which kind of course would you attend?

Fourteen participants (78%) would prefer a blended approach to learning, six persons (33%) face to face training and other six persons (33%) an online training course (multiple answers possible. Figure 26).

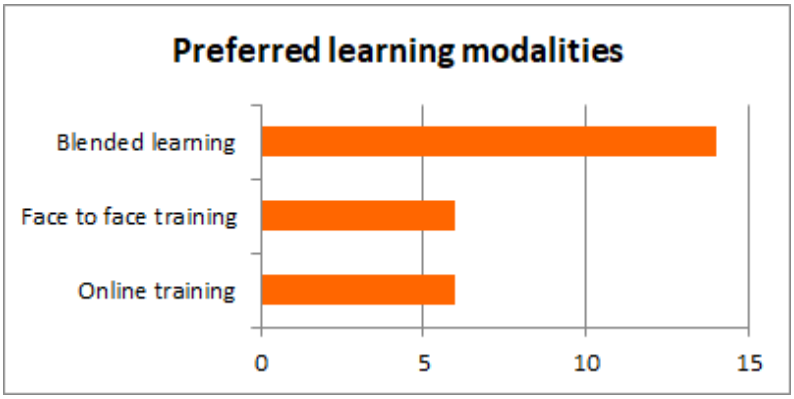

Figure 26: Preferred learning modalities

19. Within an online training, which kind of course would you attend?

Within an online learning course, eleven persons (61%) expressed preference for “mobile learning”, nine (50%) chose “flipped classroom” approach, and five (28%) the “micro learning” one (multiple answers possible. Figure 27).

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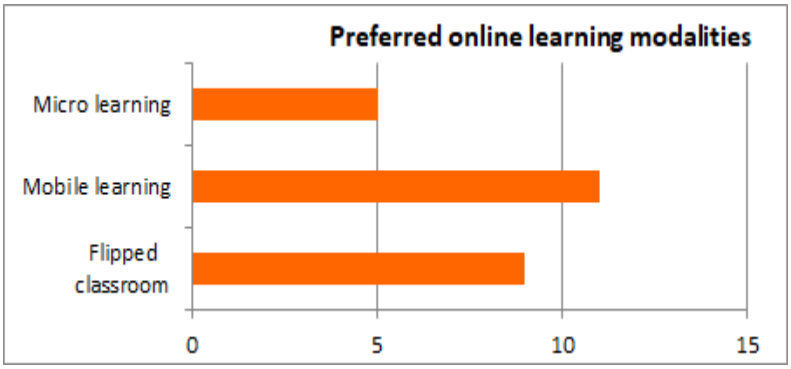

Figure 27: Preferred online learning modalities.

20. Within a face to face training, which would be the ideal size of the trained group?

Thirteen out of nineteen participants (72%) indicated the ideal size of 10-20 persons, followed by six of them (33%) who mentioned the small group with 5-10. Nobody chose the option related to "group with 20-30".

21. *"Emerging technologies"*

Participants were presented with the emerging technologies that the project will include and were asked to rank the topics from the most to least preferable. Results, listed in order of preference, are as follows:

1. Technological Aids for rehabilitation
2. Technological Aids for communication
3. Frontier technologies: Virtual reality
4. Technological Aids for domotic *
5. Frontier technologies: Brain computer interface *
6. Frontier technologies: Robotic

** These two emerging technologies are preferred equally (i.e. they were both ranked fourth)*

22. What learning outcomes would you like to achieve?

Among the learning outcomes considered as important to achieve, participants (n=19) listed in order of preference:

1. Pratical skills
2. General knowledge about existing digital tools
3. Theoretical notions

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ii. Digital skills demand among healthcare professional in Germany (Frankfurt-UAS)

Methodical Design

The questionnaire was conducted as an online survey utilizing the domain *umfrageonline.com*. The link was sent to persons working in the health and social care sector directly with clients with special needs. The online survey took place between May 30th and June 9th 2020. In order to achieve the required number of 10 persons, possible candidates were contacted via e-mail, phone or messenger service. Twelve participants filled in the survey. Thirteen Persons started, but one quit after confirming the data protection guidelines. One person only answered 20 of 22 questions. She/he was included in the data analyses. The analysis of the survey was undertaken with the web application of *umfrageonline.com*.

Demographic Characteristics

Age (Figure 28): Three persons were between 20 and 29 (25 %), five between 30 and 39 (42%), one between 40 and 49 (8%), two between 50 and 59 (17%) and one over 60 years (8%).

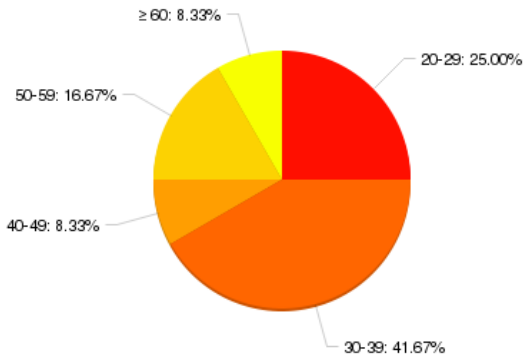

Figure 28: Age of participants

Profession: Among the participants, there were three speech and language therapists, two social workers, two specialised nurses for people with disabilities (Heilerziehungspflege), one geriatric nurse, one occupational therapist, one special education teacher, one counsellor and one student.

Working field: Five persons worked in the educational field, four in the field of care for people with disabilities, three persons in nursing care, two in rehabilitation, one in geriatric rehabilitation and one in acute neurology (multiple answers possible).

Main duties: As their main duties, the participants described direct and indirect nursing and care, development diagnostics and therapy, speech and language diagnostics and therapy, alternative and augmented communication, dysphagia management, individual and group interventions, teaching,

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teaching support, organisation of free time activities, managing a counselling centre, counselling, as well as case and discharge management.

Client groups: Persons who completed the survey were working with elderly persons, children and teenagers with disabilities (motor and cognitive), clients in need of nursing, patients with serious neurological damages; in geriatric, neurological and pneumological rehabilitation and with relatives of persons with disabilities.

Work experience: Five participants worked in their profession for 1-5 years, four persons for 6-10 years and three persons for more than 10 years. In social care three persons worked for 1-5 years, three persons for 5-10 years and 5 persons for more than 10 years (1 person answered she did not know).

Results of the Survey

In the following, the results are described in the order of the questionnaire. Questions from 1 to 15 explored the social workers' expertise on digital skills/ technology aids and their training needs, whilst those from 16 to 22 investigated their views on how a training course on digital skills/technology aids should be organized, and the characteristics it should have.

1. Every Participant answered the question "Do you usually use digital tools in your work?" with "yes".
2. All of them use digital devices like tablets or computers (Figure 29). Seven persons (58%) use low tech assistive technology devices and also seven assistive technology software. Technological aid for rehabilitation is used by two (17%) and one person (8%) uses high tech assistive technology devices. The other items were not chosen (multiple answers possible).

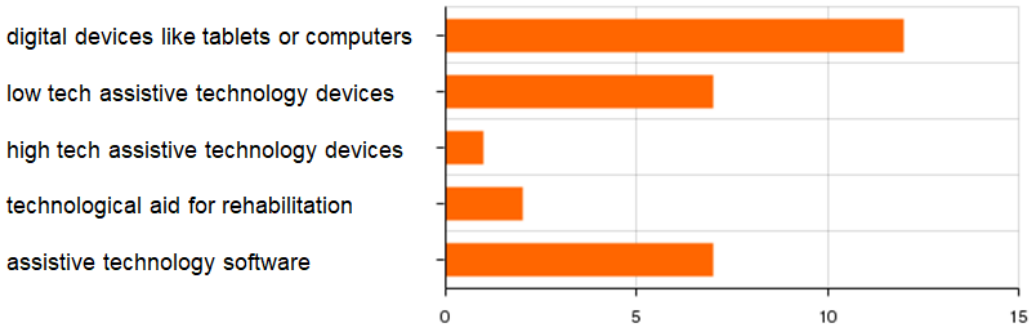

Figure 29: Use of digital skills/ technology aids

3. The question "How effective do you rate technological tools for persons with disabilities or old aged, considered as elderly people and, more in general, persons in need?" was rated with "a lot" by two participants (17%), "quite a lot" by 9 persons (75%) and "not much" by one person" (8%). "Not at

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all" was not chosen. One participant commented that it was dependant on the nature of the disability (Figure 30).

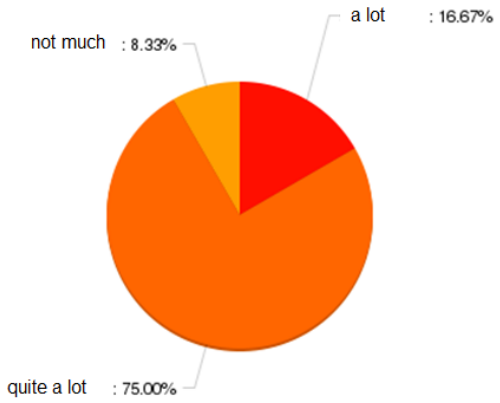

Figure 30: Considered Effectiveness of technological tools

4. Nine of the twelve participants (75%) said that Covid 19 had contributed to the implementation of more technology and digitalization in their work process. They mentioned mostly video conferences (seven persons) but also the use of tablets (two persons) and PC (one person) and distance learning (two persons) and tele therapy (one person). Two of them said, they had been given an introduction in the new technologies (multiple answers possible).

5. Nine of twelve participants (75%) said they felt qualified to handle technology aids they work with, three answered with "no". Two persons made a comment, one said, s/hemostly was, but there was much more s/he could learn. One person said, more seemed to be possible, but hs/he had to work on it much on his/her own.

6. The participant voted with an average 6 of 10 (±2,13) on a scale of confidence with digital skills / technology aids. The range was from 3 to 9. (Figure 31).

	1 (not at all)	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10 (completely)**
∑	-	-	2	2	1	1	2	3	1	-
%	-	-	16,67	16,67	8,33	8,33	16,67	25	8,33	

Figure 31. Confidence with digital skills - rating from 1 to 10

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7. The question "In your opinion, what are the main barriers to the use of digital technologies?" was answered by six persons (50%) with economic reasons (no access to digital tools), by eight persons (67%) with geographic reasons (no adequate information technology (IT) infrastructure) and by six persons (50%) with lack of proper IT education. One person said that a lack of cooperation within the organization and a lack of time to improve it were the main barriers (multiple answers possible. Figure 32).

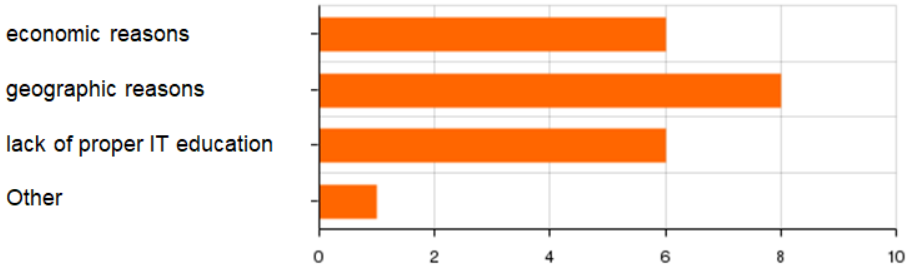

Figure 32. Main barriers to use digital technologies

8. Eight of twelve participants (67%) do not attend any courses on digital skills/technology aids per year. Three persons (25%) said 1-2 and one person (8%) 3-4 courses (Figure 33).

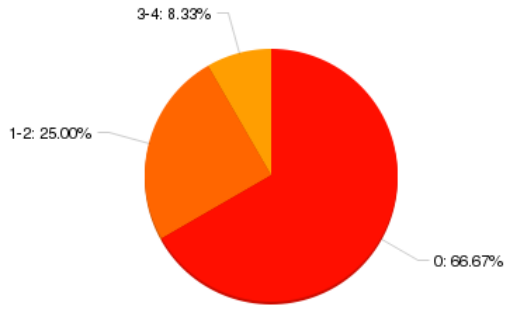

Figure 33. Attendance of courses

9. Reasons given for not attending courses (Figure 34): two participants named registration fees as being too expensive, two persons said, they would not have enough time to attend training courses and four persons did not find training courses of their interest. One person added that there was no need

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to attend a course and another person said, courses were only offered by the employer in her free time.

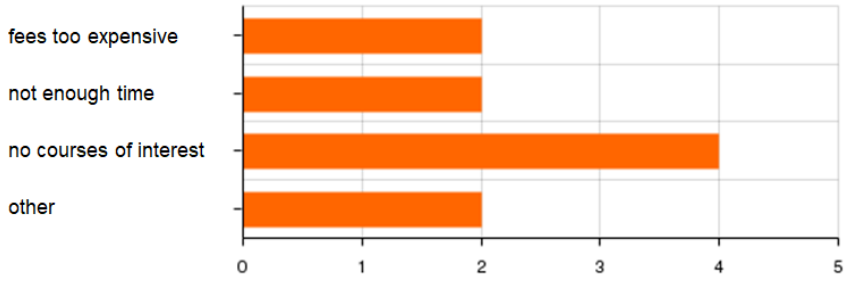

Figure 34: Reasons for not attending courses

10. Ten out of twelve participants (83%) stated that more training about digital skills/technology aids is needed for social/ healthcare workers, one did not deem it necessary d, one said, s/hedid not know. One person added that training measures should take place during the working time.

11. All participants (n=12) said that digital skills/technology should be taught at their workplace. (Working fields as mentioned above: care of elderly persons, care of pesons with disabilities, rehabilitation, geriatric rehabilitation, acute neurology, educational field, nursing)

12. Most participants assumed a positive impact of training (Figure 35) about digital skills/technology aids on their ability to do their job: Five said it would simplify or speed up daily activities (42%), nine said it would provide them with additional and better options for their job (75%) (multiple answers possible), two said they did not know (17%) and none of them stated that there would be no impact.

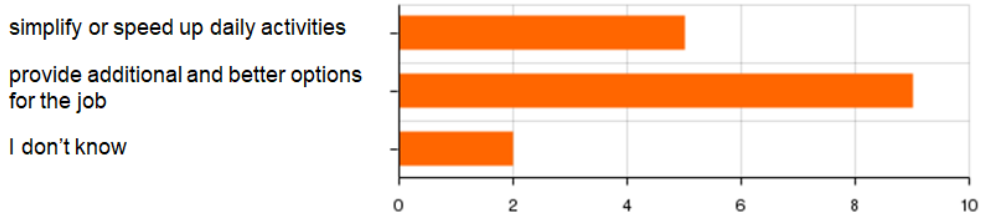

Figure 35: Impact of training

13. The question "What kind of digital skills do you think might be most effective for your job or you would like to learn/improve?" answered eight persons (67%) with "assistive technology software (mobile

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Apps, AAC software, etc.)", six persons (50%) with "digital devices (e.g. tablet, PC, etc)", also six persons with "robotics", four persons (33%) with "high tech assistive technology devices (e.g. eyetracker)" and with "domotics", three (25%) with "low tech assistive technology devices (e.g. switches, VOCAs, joystick, etc)" and with "technical aids for rehabilitation" and two persons (17%) with "virtual reality", "Brain Computer Interface" and "Ambient Assisted Living" (multiple answers possible. Figure 36).

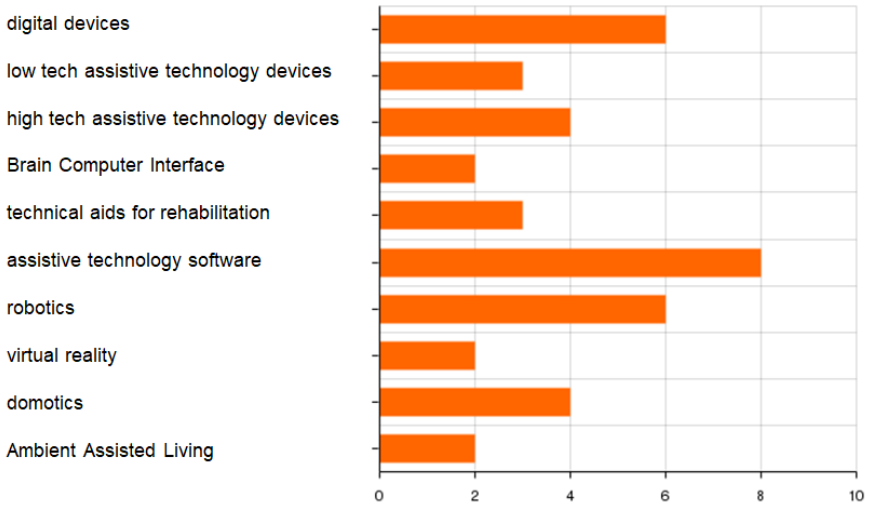

Figure 36: Digital skills participants would like to learn

14. All participants said they would attend training workshops focused on above mentioned digital skills/technology.

15. Also, all participants confirmed they would like to be updated on news on training workshops and events.

16. Most participants, eleven out of twelve (92%), thought it is necessary to know the course programme in order to to decide to join a training course. For eight persons (67%) the topic was decisive and also for eight persons the availability of the technology within their workplace. Six persons (50%) said course duration would be a key point; five persons (42%) said the price, and three persons (25%) the expertise of the tutors. One participant added that trainings should also be offered for part-time workers in their working ours (half day) (Figure 37).

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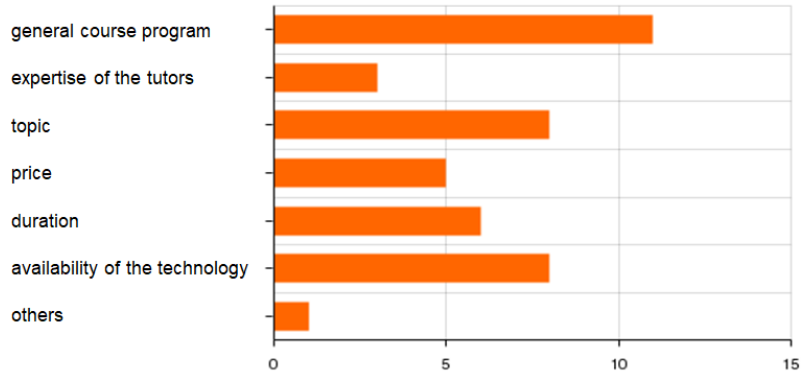

Figure 37: Reasons to join a training course

17. The answers about the organization of the course varied a lot: Four participants (33%) voted for one day a week for some weeks, three (25%) for two days a week for some months, two for an intensive week (17%) and also two for up to half a day for several weeks, one added “two days”. Nobody voted for some weekends within the same month. (Figure 38).

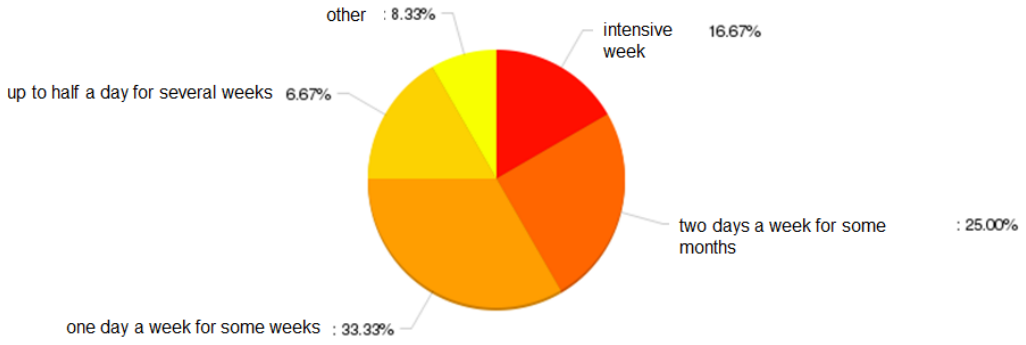

Figure 38. Organization of training courses

18. Six participants (50%) preferred blended learning as attendance modality for a course, four persons (33%) face to face training and 2 persons (17%) an online training course (Figure 39).

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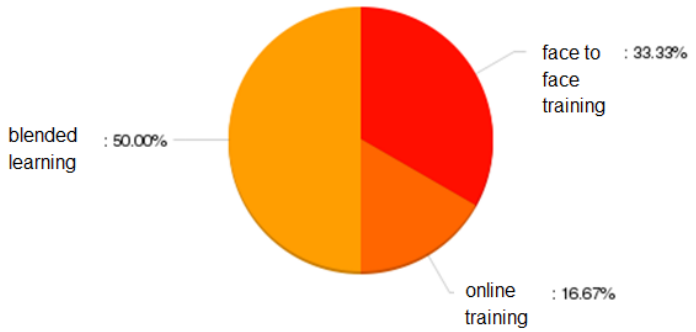

Figure 39. Preferred learning modalities

19. Within an online learning course, ten persons (83%) would prefer flipped classroom, seven (58%) mobile learning and four persons (33%) micro learning (multiple answers possible. Figure 40).

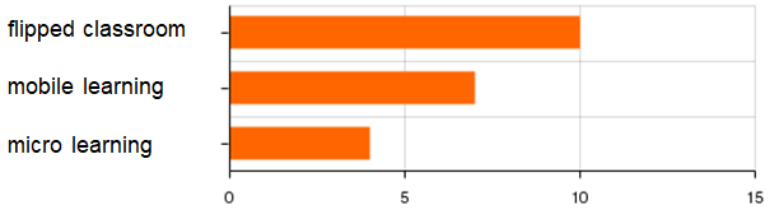

Figure 40. Preferred online learning modalities

20. The ideal size of the trained group rated seven persons (58%) with 10-20 and five (42%) with 5-10 persons.

21. Among the topics that should be included in the training, the participants (n=11) listed in order of preference (One person did not vote; One person did not include robotics and added, she did not know it):

    1. Technological Aids for communication
    2. Technological Aids for domotics
    3. Technological Aids for rehabilitation
    4. Frontier technologies: Virtual reality
    5. Frontier technologies: Robotics

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6. Frontier technologies: Brain computer interface

22. Among the learning outcomes the participants (n=11) listed as most important to achieve:

1. Practical Skills
2. Theoretical notions / General knowledge about existing digital tools

iii. Digital skills demand among healthcare professional in Greece (Ergastiri)

Methodological Design

Our organisation felt more appropriate, in lieu of the local social conditions, to utilize the Focus Group research method. We held a focus group of 9 (nine) professionals working in the health and social care sector, as per the project's requirements. The meeting was hosted in our organisation's facilities in Ano Liosia, Athens, Greece at June 5, 2020. The professionals were chosen from the pool of the employees of "To Ergastiri" based on their experience, field of work and academic training. An email was sent out to all candidates in order to inform them in regard to DDSkill and the focus group purpose, methodology, time and place etc.

Of the thirty-two (32) employees of the organisation we received twelve (12) confirmations of participation which were rounded down to ten (10).

One participant was not able to attend, informing on a last-minute notice and as such, we were not able to replace the attendee.

Demographic Characteristics

All the participants are professionals working in the field of Adults with Intellectual Disability and concomitant impairments (Autism spectrum disorder, mental disabilities)

The group was composed of three (3) Psychologists, two (2) Occupational Therapist, two (2) Physical Education Teachers a Speech Therapist and an IT professional.

Results of the Survey

Based on the participants' answers and comments the results of the focus group are the following. Questions from 1 to 15 explored the social workers' expertise on digital skills/ technology aids and their training needs, whilst those from 16 to 22 investigated their views on how a training course on digital skills/technology aids should be organized, and the characteristics it should have.

1. *Do you usually use digital tools in your work?*

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Eight out of the nine participants, responded positively, mentioning that mostly they use laptops and tablets for programmes, like videos and PowerPoint presentations so that our beneficiaries can exercise in a number of activities. (Figure 41).

Figure 41: Use of digital tools

2. *For whom answered YES to the previous question, what kinds of digital skills/ technology aids do you currently use in your workplace?*

Eight participants utilize, in everyday work, digital devices, only one uses Low tech assistive technology devices, five make use of assistive technology software; two make use of virtual reality applications in social scenarios and three, domotics.

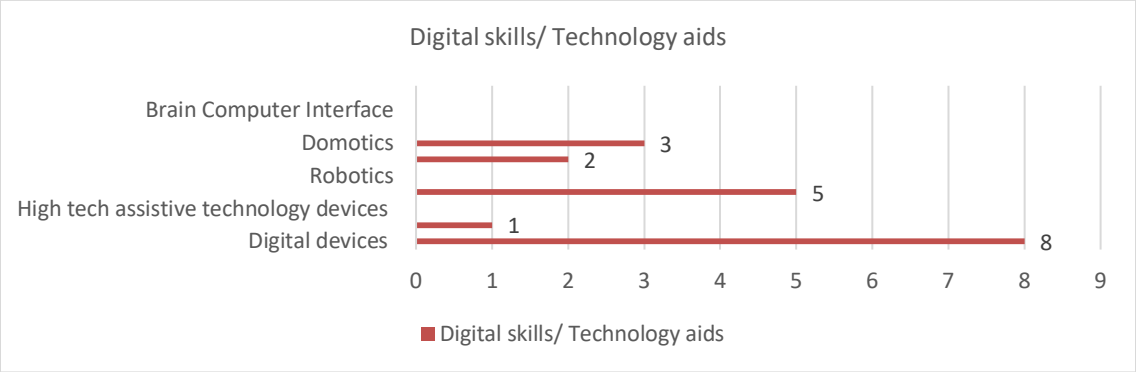

Figure 42: Kind of digital skills/technology aids used in workplace.

3. *How effective do you rate technological tools for persons with disabilities or old aged, considered as elderly people and, more in general, persons in need?*

Four participants responded “a lot”, four participants responded “quite a lot” and one answered “not much” (Figure 43).

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When asked to comment, the participants agreed that the actual impact is relevant to the environment (Professionals digital skill level, carers and family's attitude) and the training approach. Examples were cited whereas clients able to use smartphones, refused to use templates or PCs. The consensus was that carers and families' approach to the use of technology plays huge role in the client's acceptance or not of a technological aid.

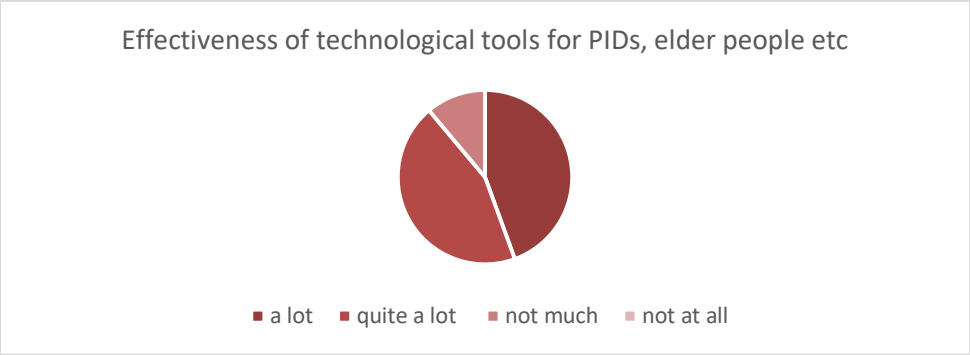

Figure 43: Considered Effectiveness of technological tools.

4. *Covid 19 has contributed to the implementation of more technology and digitization in the work process. Did you experience the same? What kind of technologies?*

Eight out of the nine participants worked remotely (Microsoft office 365 applications).

All professionals agreed the Covid 19 pandemic has created a need and a drive for implementing digital technologies. All nine participants were involved in distance learning initiatives. During the quarantine, teleconferences were frequent between the professionals and the beneficiaries. These calls were used to continuously support our organisation's clients. Skype, Viber and Facebook Messenger were the platforms mostly used. With these means of telecommunication, it was like a daily presence in beneficiaries' lives in this crucial period of pandemic. Furthermore, the professionals created educational videos for the beneficiaries.

5. *Do you feel qualified to handle technology aids you work with?*

Eight out of nine professionals felt that they were qualified to handle the technological aids in use. During discussion, the consensus was that the level of complexity of the aids used is low and that, the professionals don't have enough education on how to use them in order to supply quality education on the beneficiaries. One participant noted that PIDs are dependent on their careers, which in many cases

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are elder and in need themselves, and that must be taken into account. Most of the participants pointed out that they don't have enough technological equipment.

6. *How confident do you feel with digital skills/technology aids?*

In a confidence scale of 1 to 10 (1 Low, 10 High), the participants ranged from 9 to 5 (1X5, 2X6, 2X8, 4X9) on an average of 8.

7. In your opinion, what are the main barriers to the use of digital technologies?

According to the participants, the major barrier is the lack of IT training (8 out of 9) with only one participant choosing economic reasons. In the discussion following, it was pointed out that Greece has a low integration of digital technology (Greece ranks 27th out of the 28 EU Member States in both 2017 and 2018, indicating a low integration of more sophisticated digital technologies throughout the economy. The country's performance in digital public services and digital skills remains low, a fact that can act as a barrier for further development of the digital economy and society.

(MONITORING PROGRESS IN NATIONAL INITIATIVES ON DIGITISING INDUSTRY, Country Report – Greece July 2019 assessed: 12/06/2020 https://ec.europa.eu/information_society/newsroom/image/document/2019-32/country_report_-_greece_-_final_2019_0D30BA6D-A5FB-5608-9F34E267E7515DDE_61207.pdf)

8. *How many courses on digital skills/technology aids do you generally attend per year?*

Five out of nine participants do not attend any training course (0), two participate in 1-2 courses per year, while two notes that they attend more than four training courses per year (Figure 44).

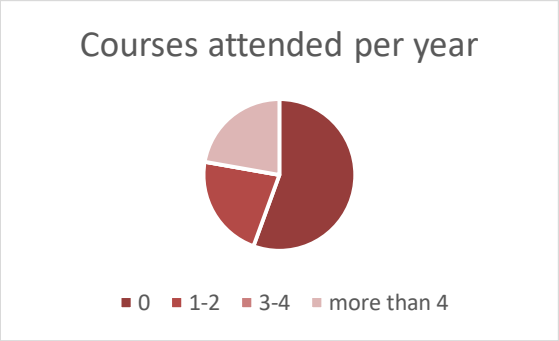

Figure 44: Courses attended per year.

9. *For whom answered "0", could you kindly explain why?*

Two participants cited as reason the lack of time while two the actual cost of the courses and one the lack of interesting offered courses.

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10. *Do you feel that more training about digital skills/technology aids is needed for social/ healthcare professionals?*

All participants answered YES that they need more education in technology but they pointed out that this education should also be provided to the beneficiaries so the results would be positive for both of them.

11. *Do you think it is necessary to have these skills taught in your workplace?*

All participants agreed that it is necessary to have digital skill taught in the work place. Participants cited the low interest of creating tailor made solutions (Intellectual disability) for the sector by the IT industry.

12. *How would the training about digital skills/technology aids impact on your ability to do your job?*

Four participants answered that it would simplify/speed up daily activities in the workplace while eight think the It would provide them with additional and better options for my job (Figure 45).

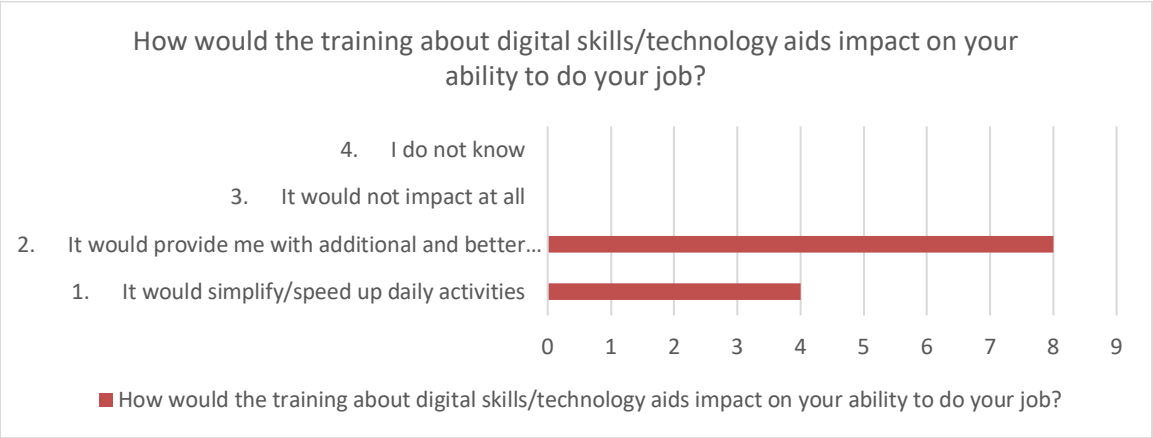

Figure 45: Impact of training.

13. *What kind of digital skill do you think might be most effective for your job or you would like to learn/improve?*

Participants ranked the suggested technologies from most important to least important. The choices provided were:

1. Digital devices (e.g. tablet, PC, etc)
2. Low tech assistive technology devices (e.g. switches, VOCAs, joystick, etc)
3. High tech assistive technology devices (e.g. eyetracker)
4. Assistive technology software (mobile Apps, AAC software, etc)

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5. Robotics

6. Virtual Reality

Eight out of nine participants feel that Digital devices (e.g. tablet, PC, etc), Assistive technology software and robotics would most effective. Six ranked Robotics. Five participants ranked Low tech assistive technology devices (e.g. switches, VOCAs, joystick, etc) and High-tech assistive technology devices (e.g. eyetracker) as useful for their work. Virtual reality was picked by seven (Multiple choices were available. Figure 46).

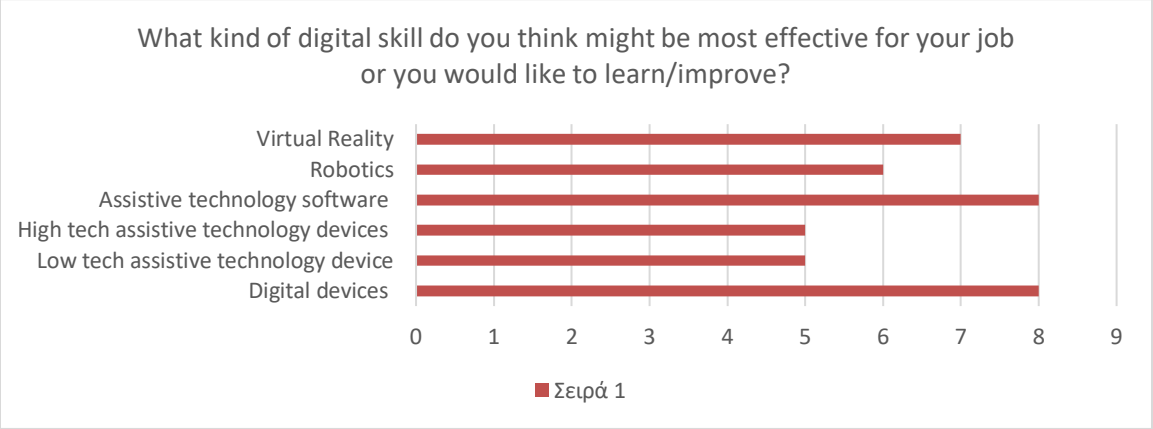

Figure 46: Digital skills participants would like to learn.

14. *Would you attend training workshops focused on digital skills/technology?*

All participants replied positively.

15. *Would you like to be updated on training workshops news and events?*

Eight out of nine participants would like to be notified for training workshops opportunities and events.

16. *What would you evaluate as necessary to decide to join a training course focused on digital skills/technology aids?*

From the reason provided to the participants, nine indicated the topic of the course as the most important factor in their choice, followed by the price (eight), Availability of the technology within the workplace and the general course programme (four). Three participants choose the apparent expertise of the tutors, while two out nine sited the course duration (Figure 47).

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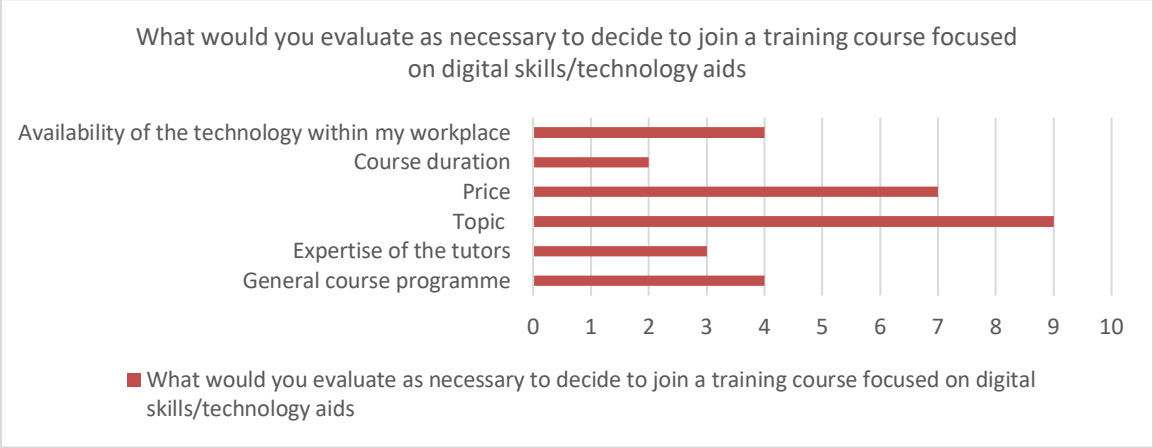

Figure 47: Reasons to join a training course.

17. How should the course be organized?

The participants for the most part (five out of nine) preferred a looser time frame of only a day per week for some weeks. The choices of some weekends within the same months and only two days a month we picked by two participants. In the following discussion, the participants reasoned their choices in the heavy daily work load and work – family balance. Furthermore, five out of the nine participants mentioned that they do hold an afternoon job as well, making their attendance to a training course more difficult.

18. Which kind of course would you attend?

Participants would readily prefer a blended approach to learning (seven out of nine). On would prefer an online training course while one participant preferred a solely face to face training traditional classroom (Figure 48).

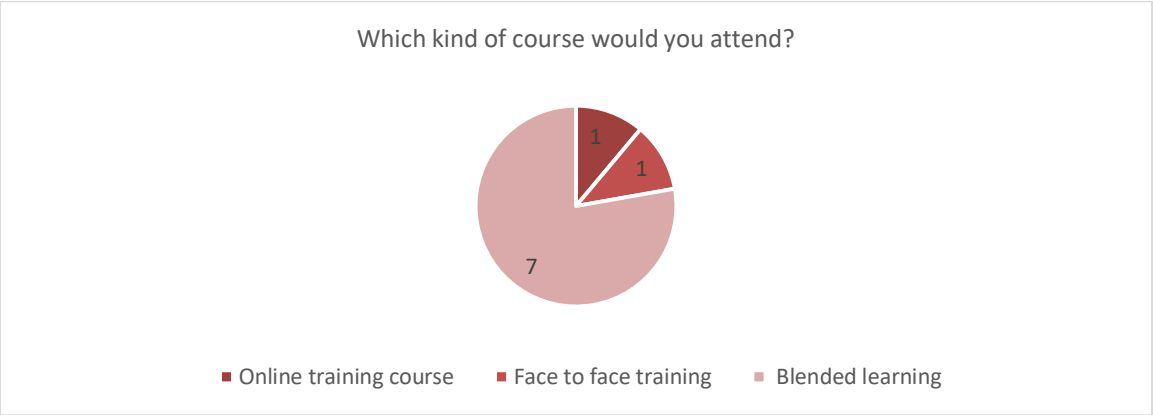

Figure 48: Preferred learning modalities.

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19. Different types of online training courses

If participants were to choose an online training course, they would prefer the flipped classroom approach (six out of nine). Two participants expressed preference for mobile learning, while one preferred Micro learning (Figure 49).

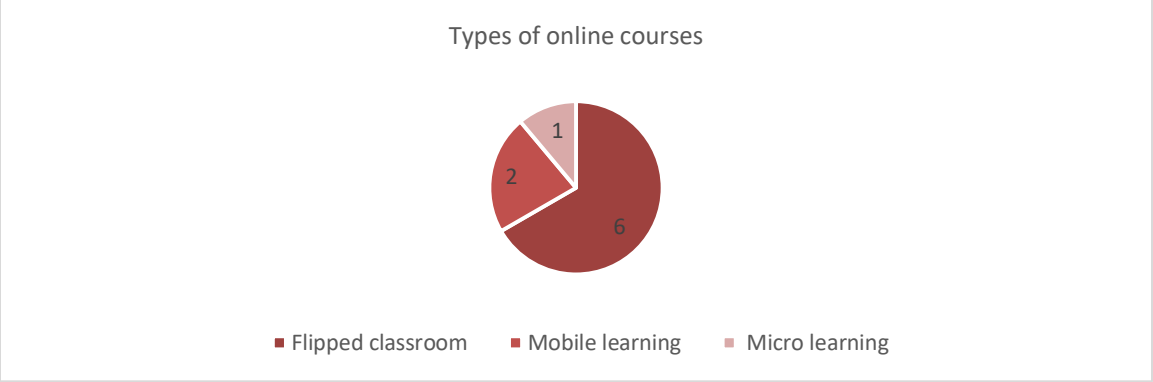

Figure 49: Preferred online learning modalities.

20. Within a face to face training, which would be the ideal size of the trained group, in your opinion?

All participants preferred a small group of 5 – 10 people. In the following discussion, one participant mentioned that such a small group has a better dynamic. Four participants mentioned that in their experience the group dynamic for adult learning in that kind of group means better prospects of exchanging work experience and ideas.

21. Emerging technologies

The participant were presented with the emerging technologies that the project will include. The participants were asked to rank the subjects from the most to least preferable. As such the resulted ranking is as following:

1. Technological Aids for communication
2. Technological Aids for domotic
3. Technological Aids for rehabilitation
4. Frontier technologies: Virtual reality
5. Frontier technologies: Robotic
6. Frontier technologies: Brain computer interface
7. *What learning outcomes would you like to achieve?*

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Eight out of nine participants expressed their wish to improve e their practical skills in their everyday work. Two choose theoretical and four participants would like to achieve an overall general knowledge about existing digital tool

iv. Digital skills demand among healthcare professional in Ireland (NUIG)

Two online advisory panel meetings were held via Microsoft Teams, with 10 participants, 5 in each meeting. The meetings took a focus group format.

Demographic Characteristics

Participants consisted of one Physiotherapist, three Speech and Language Therapists, one Occupational Therapist, two Behavioural Psychologists, two Behaviour Therapists and one Innovations Manager. Participants ranged in age 20-30 (1), 30-40 (8) and 40-50 (1). All participants worked in disability services and had between 4 and 22 years of experience.

Results of the Survey

All 10 participants indicated that they currently utilize digital skills/technology aids in their workplace (Figure 50).

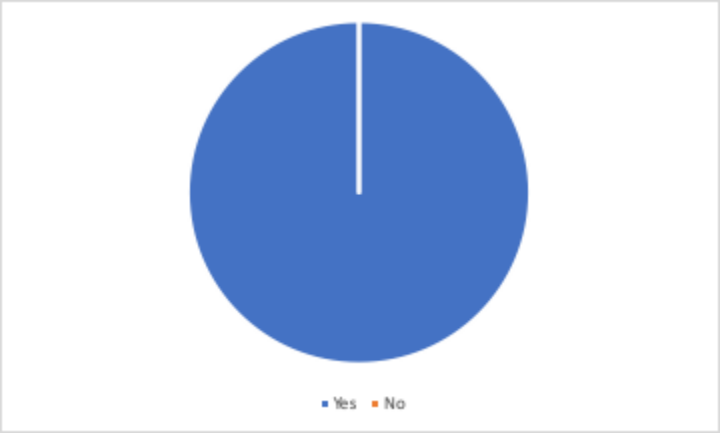

Figure 50: Use of Digital tool in the workplace

The range of technologies currently in use include: digital devices (tablets, mobile devices, laptops); low tech assistive technology devices (e.g. switches, joysticks, motorised wheelchairs); High tech assistive technology devices (e.g. eye tracker); Assistive technology software (e.g. AAC software and mobile apps). One participant reported using AAL in the form of environmental controls to complete household tasks (e.g. open curtain, and turn on cooker) for clients with poor mobility. In addition, one participant reported

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using VR to support clients with anxiety related to transitions by allowing them a safe virtual space to practice transitions (Figure 51).

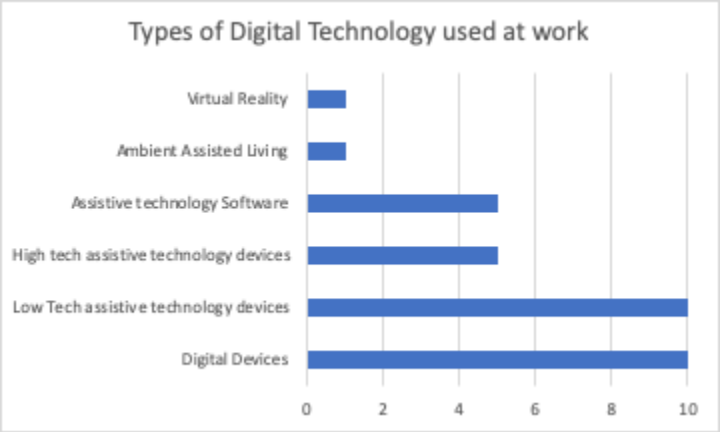

Figure 51. Types of digital technology used within their workplace

When asked about how effective they rate technology tools for people with disabilities all participants stated 'a lot' or 'quite a lot'. However, they indicated that success was dependent on a number of factors: (1) the device or technology can be underutilized and is dependent on carer (staff and families) engagement; (2) Staff skills set – a lack of knowledge amongst staff and families about software and devices can results in a high level of burden on clinicians to solve challenges / identify the functions of a device; (3) workload/time - to upload/update software without IT support and provide demonstrations on how to use the device; (4) lack of training - for themselves as professionals for what might work best for a client.

Of the nine participants indicated that they did not feel qualified to handle technology aids that they work with and one reported that they did, but only with some devices. Participants rated their confidence in using technology as 5 (n=4), 6 (n=3), 7 (n=2), 8 (n=1). The main barriers reported to accessing digital technologies were: (1) economic – in particular access to funding; (2) environmental support at school and home; (3) lack of IT education and support; (4) no framework for how to follow through on successful implementation after the purchase of the device; (4) responsibility of choosing the right device; and (6)

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lack of multi-disciplinary approach or inter-agency co-operation (Figure 52).

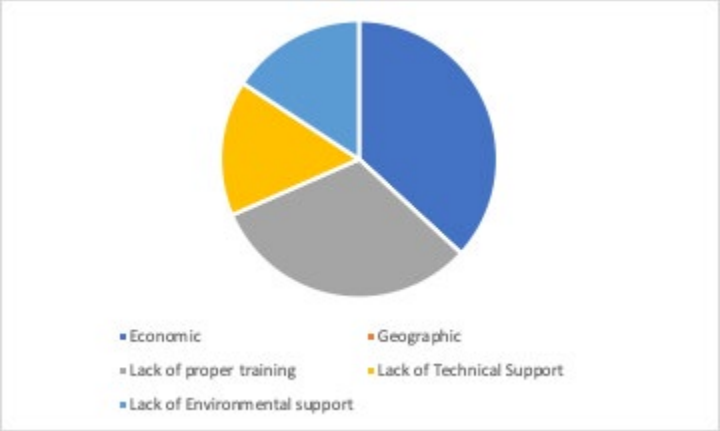

Figure 52: Barriers to the use of Digital Technologies.

Eight of the 10 participants reported that they had attended no formal training. Two participants reported attending on average 1 course per year, and a further two participants reported having attended 4-6 webinars on the use of AAC, typically provided by the product developer (Figure 53). Six participants reported receiving informal training in the form of a demonstration of the device from a company representative. Some participants made reference to the fact that their most valuable resource was informal networks of other clinicians who share an interest in technology or devices such as AAC.

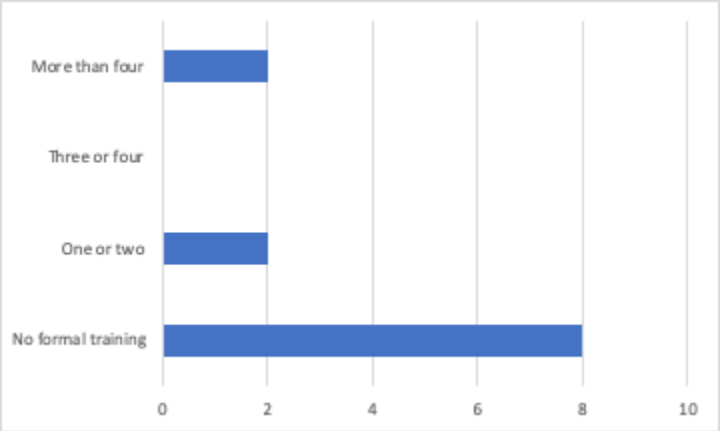

Figure 53: Number of courses on digital skills/technology attend per year

Of those who reported not having attended formal training 8 reported that to date they had not found a training course of interest to them. One reported registration fee, time and not being able to find a course of interest to them while one participant reported that the courses available are more generic and they are seeking information on how to integration technology into an organization and make it systemic.

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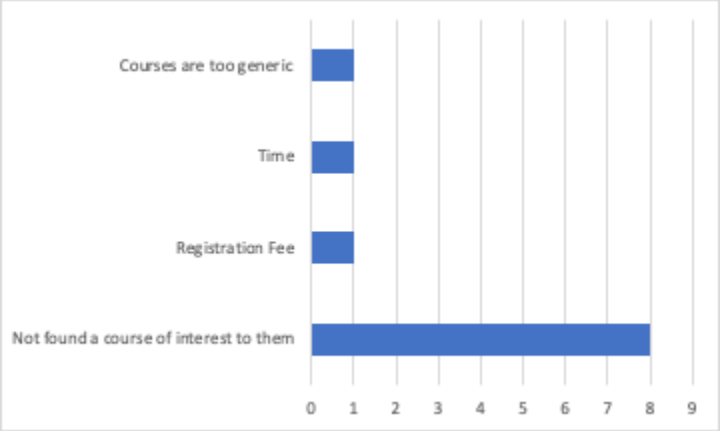

Figure 54: Reasons for not attending training course

All 10 participants agreed that more training about digital skills/technology aids is needed for social/healthcare professionals. In addition, training also needs to be available to teachers and families. All participants agreed that it is necessary to teach these skills in their workplace. Four participants highlighted that you need to be able to practice and see the devices in use and trial them, while one participant stated that sector specific training would be beneficial.

When asked about how training would impact on their ability to do their job six participants indicated that it would provide them with additional or better options, or framework for selecting a device, three stated that it would speed up their daily activities if staff and families had a basic knowledge of digital skills and technology aids. One participant was unsure and said it might depend on the training (Figure 55).

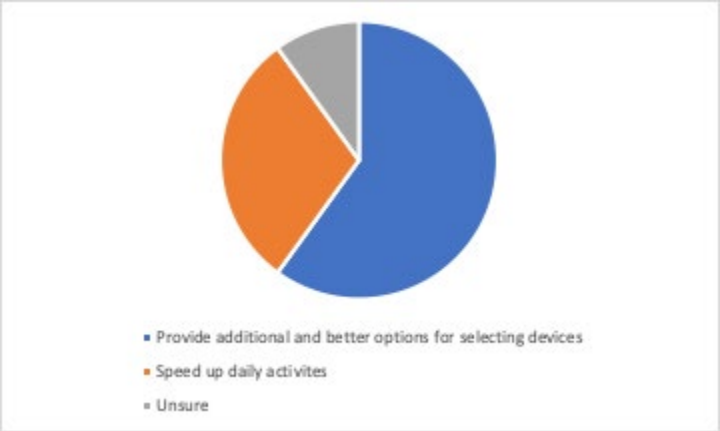

Figure 55: The impact of digital skills/ technology aids on your ability to do your job

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When asked about what kind of digital skills they felt would be most effective for their job most listed digital devices, low tech assistive technology devices, high tech assistive technology devices, and assistive technology software as it was more in line with the needs of their client group (Figure 56).

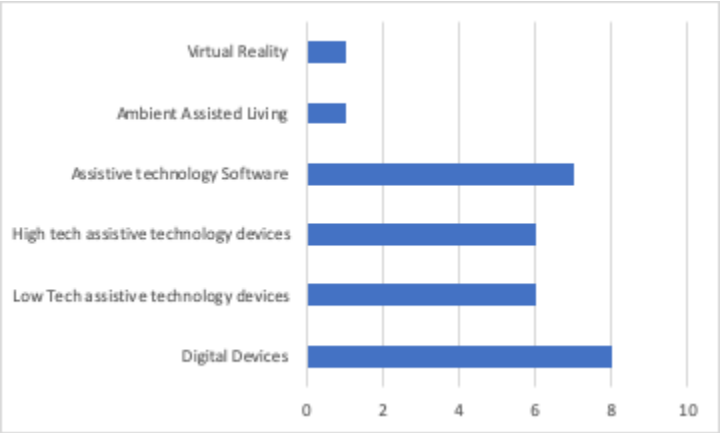

Figure 56. Digital skills/ technology aids which would be most effective in your job

Participants felt they needed to achieve this level first before extending to new technologies. All Participants reported that an overview of what is available would be useful as they felt that currently they have to go to each company to learn about each device, but nothing is available centrally. They expressed an interest in more detail for devices being considered for a client (if they are available financially). Participants also expressed the need for more evidence base for the effectiveness of the device(s) to verify that the technology is better than the traditional option, and a list of the pre-requisites to use it, in particular an assessment framework in identifying if a client is suitable for the device. All participants expressed that they would attend training workshops focused on digital skills and technology aids and to be updated on training workshops and events.

When asked about their opinions about training participants reported that the topic (n=8), price (n=7), course duration (2), relevance to their work/availability of the technology within their workplace (n=3), how it is delivered (n=3), and expertise of tutor (n=3) were relevant (Figure 57). With respect to how the course should be organized 5 participants selected an intensive week, as they reported that it is easier to block time off from work and focus on the content. However, 5 participants indicated that they preferred if training was more staggered (e.g. two days a month for some months or one day a week for some weeks) as they reported it allows them the opportunity to reflect or trial a device and then get follow up.

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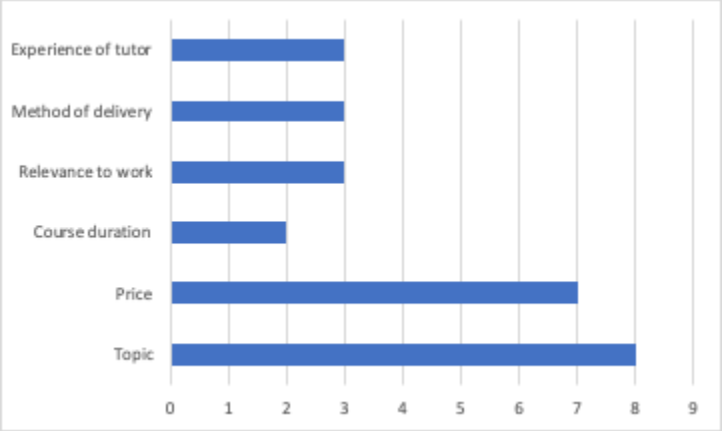

Figure 57: Factors which would influence your decision to join a training course on digital skills/technology aids

Of the 10 participants, eight indicated a preference for blended learning and while two had a preference for face to face. With respect to online courses participants indicated that they would be interested in receiving content via a flipped classroom (n=3), micro learning (n=4), blended learning (n=3) or a combination of flipped and micro (Figure 58). For face to face training, all participants indicated that 10 attendees would be optimum, with 20-25 being an upper limited if it as a large group.

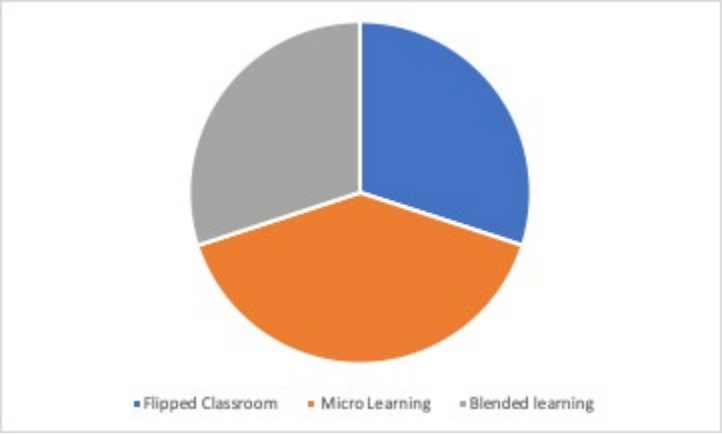

Figure 58. Participants' preferences for the approaching to receiving content

When asked to indicate their preference for the technology aids they believed should be included in the training six participants indicated technology for communication was their greatest priority, five participants expressed an interest in VR, and one participant expressed an interest in all topics (i.e. domotics, communication, brain computer interface, VR and robotics).

In relation to their intended learning outcomes from attending training, five participants said that practical skills, theoretical notions and general knowledge about existing digital tools were important for them,

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whereas for other practical skills (n=4) or general knowledge about existing tools (n=2) were their main focus. One participant reported that they would like to learn more about how to evaluate the effectiveness of technology and how to make it sustainable for clients (Figure 59).

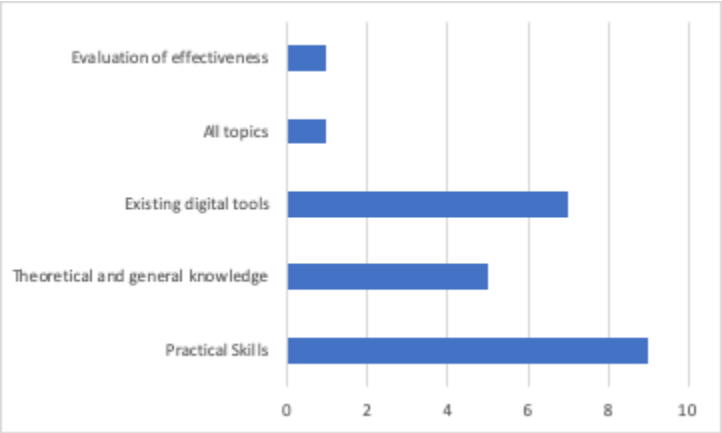

Figure 59: Learning outcomes of interest to participants

v. Digital skills demand among social/health care professional in Lithuania (JDC)

Methodical Design

The questionnaire was conducted as an online survey. The possible candidates were contacted via Facebook, e-mail, phone.

The link was sent to persons working in the social care sector directly with persons with intellectual disabilities. The online survey took place between May 30th and June 9th 2020.

Twenty-six respondents filled in the survey.

Demographic Characteristics

Age (Figure 60):

- Ten respondents between 20 and 30 (38,5 %),
- Five respondents between 30 and 40 (19,2%),
- Eight respondents between 40 and 50 (30,8%),
- One respondent between 50 and 60 (3,8%)
- Two respondents between over 60 years (7,7%).

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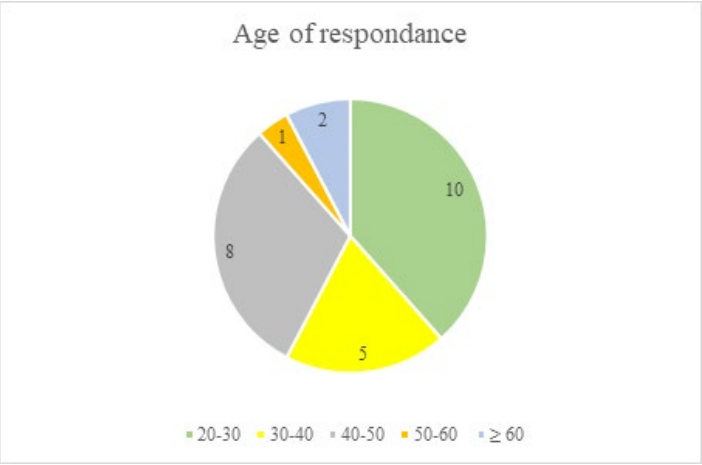

Figure 60: Age of respondents

Profession: social workers, assistants of social workers, special needs teachers.

Working field: day care centrums for people with intellectual disabilities, social help department at the local municipality, social help department at the national hospital.

Main duties: direct work with people with disabilities; policymaking for people with disabilities; coordination of the work of social workers.

Client groups: people with intellectual disabilities.

Work experience (Figure 61):

- 1- years' experience 4 respondents (15,38 %),
- 2- years' experience 4 respondents (15,38 %),
- 3- years' experience 3 respondents (11,54 %),
- 4- years' experience 1 respondent (3,85 %),
- 5- years' experience 2 respondents (7,69 %),
- 7- years' experience 2 respondents (7,69 %),
- 10- years' experience 1 respondent (3,85 %),
- 11- years' experience 2 respondents (7,69 %),
- 12- years' experience 1 respondent (3,85 %),
- 18- years' experience 2 respondents (7,69 %),
- 20- years' experience 2 respondents (7,69 %),
- 22- years' experience 2 respondents (7,69 %).

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Figure 61: Work experience of respondents.

Results of the Survey

In the following, the results are described in the order of the questionnaire. Questions from 1 to 15 explored the social workers' expertise on digital skills/ technology aids and their training needs, whilst those from 16 to 22 investigated their views on how a training course on digital skills/technology aids should be organized, and the characteristics it should have.

1. *Twenty-five out of 26 respondents usually use digital tools in the work* (Figure 62).

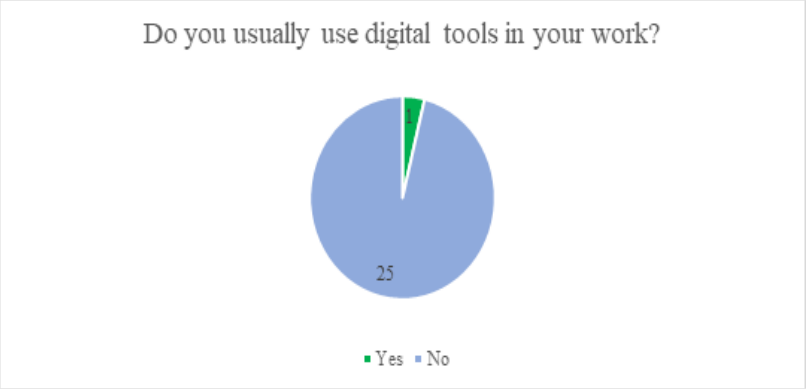

Figure 62: Use of digital tools.

2. *The digital tools respondent use in the work* (Figure 63):

- Digital devises (e.g. tablet, PC, etc) 25 respondents (100%)
- Low tech assistive technology devices (e.g. switches, VOCAs, joystick, etc) 2 respondents (8%)
- High tech assistive technology devices (e.g. eyetracker) 0 respondents (0%)
- Assistive technology software (mobile Apps, AAC software, etc) 7 respondents (28%)
- Robotics 0 respondents (0%)

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- Virtual Reality 0 respondents (0%)
- Domotics 0 respondents 0%)
- Ambient Assisted Living 1 respondents (4%)
- Brain Computer Interface 0 respondents (0%)

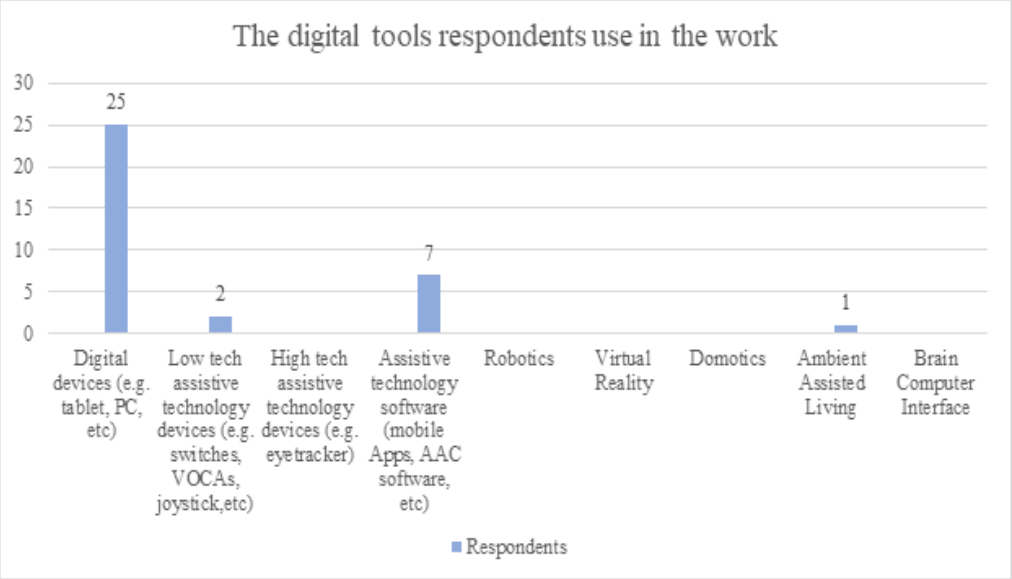

Figure 63: The digital tools respondents use in the work

3. *The rate of effectiveness of technological tools for persons with disabilities (*Figure 64*):*

a lot - 7 respondents (26,9%)

- quite a lot - 18 respondents (69,2%)
- not much - 0 respondents (0%)
- not at all- 0 respondents (0%)

Comment: Technological tools are effective, but they are lacking (they are not available in the workplace)

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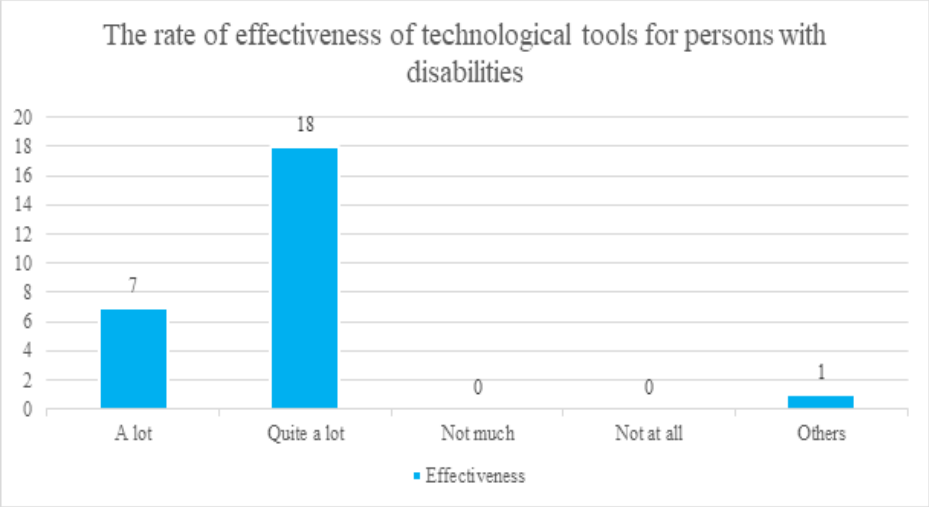

Figure 64: The rate of effectiveness of technological tools for persons with disabilities

4. *Working methods used during Covid –19* (Figure 65):

- Remote Work - 24 respondents (92,3%)
- Distance Learning- 23 respondents (88,5%)
- Telehealth – 5 respondents (19,2%)
- Robotics - 0 respondents (0%)

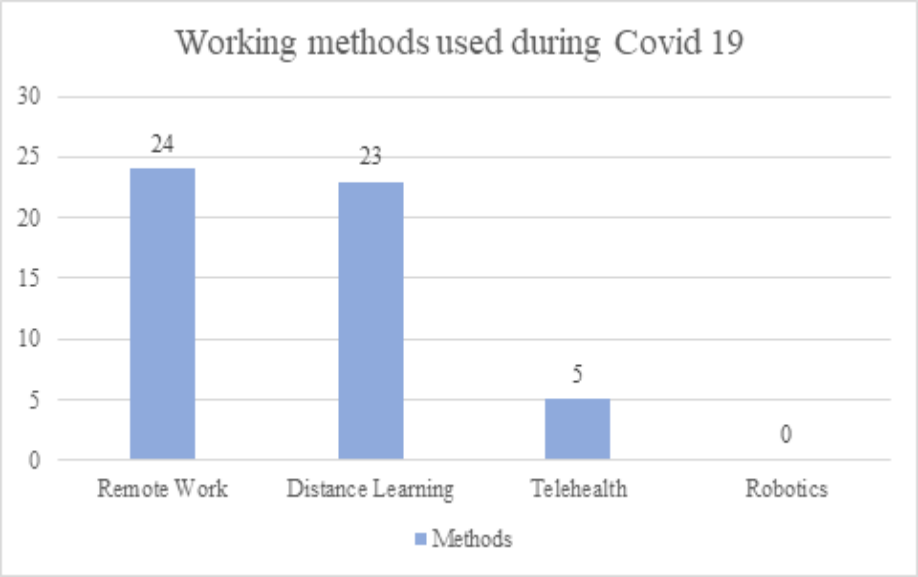

Figure 65: Working methods used during Covid –19.

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5. *Number of respondents feeling qualified to handle technology aids at work* (Figure 66*).*

- Yes - 19 respondents (73,1%)
- No - 4 respondents (15,4%)

Comments:

1. lack of skills -1 respondent (3,8%)
2. not always -1 respondent (3,8%)
3. technology is constantly changing, so I can't say absolutely Yes -1 respondent (3,8%)

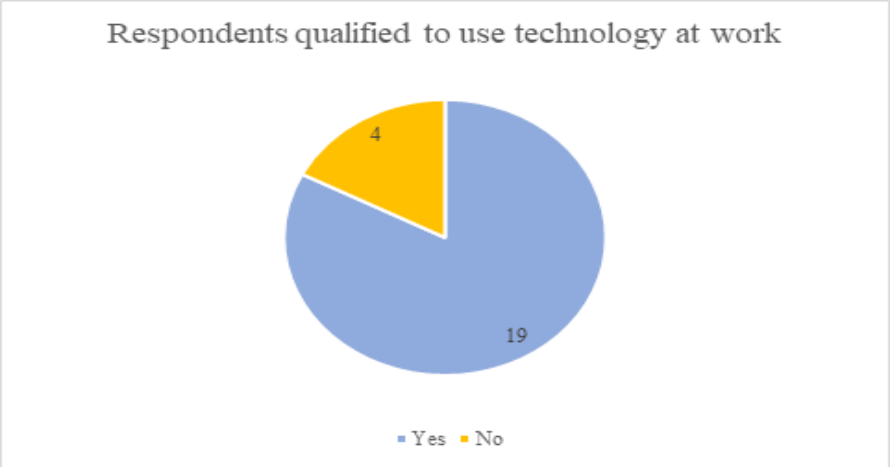

Figure 66: Respondents qualified to use technology at work.

6. *Respondents assess their competence in the use of assistive technology* (Figure 67).

They voted with an average 7 and 8 (of 10) on a scale of confidence with digital skills / technology aids, by using a scale from 0 to 10 to indicate how confident they are with digital skills/technology aids.

The range was:

1 - 0 respondents (0,00%)

2 – 0 respondents (0,0%)

3 - 1 respondent (3,8%)

4 – 10 respondents (0,0%)

5 - 2 respondents (7,7%)

6 – 4 respondents (15,4%)

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7 - 7 respondents (26,9%)

8 –7 respondents (26,9%)

9 -3 respondents (11,5%)

10 - 2 respondents (7,7%)

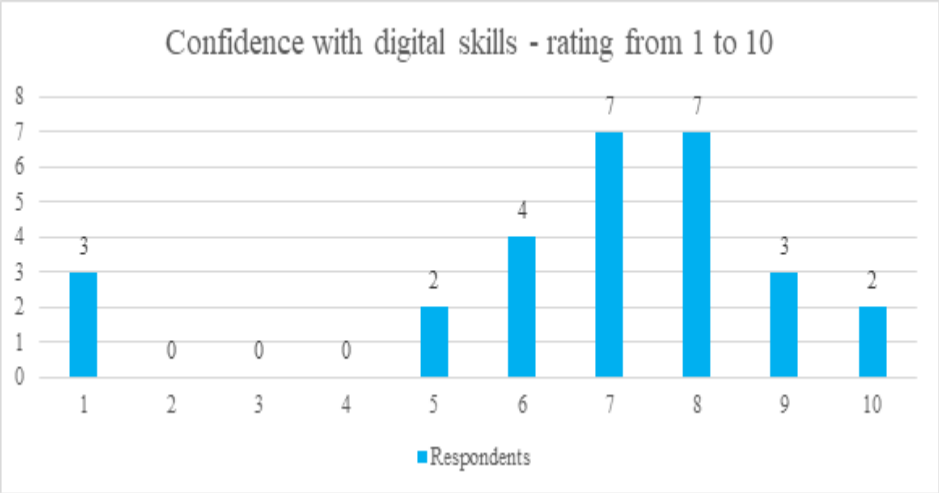

Figure 67: confidence with digital skills - rating from 0 to 10.

The main barriers to use of digital technologies (Figure 68).

- Economic- 10 respondents (38,5%)
- Geographic - 0 respondents (0,0%)
- Lack of proper IT education- 19 respondents (73,1%)

Comments: no barriers -1 respondent (3,8%)

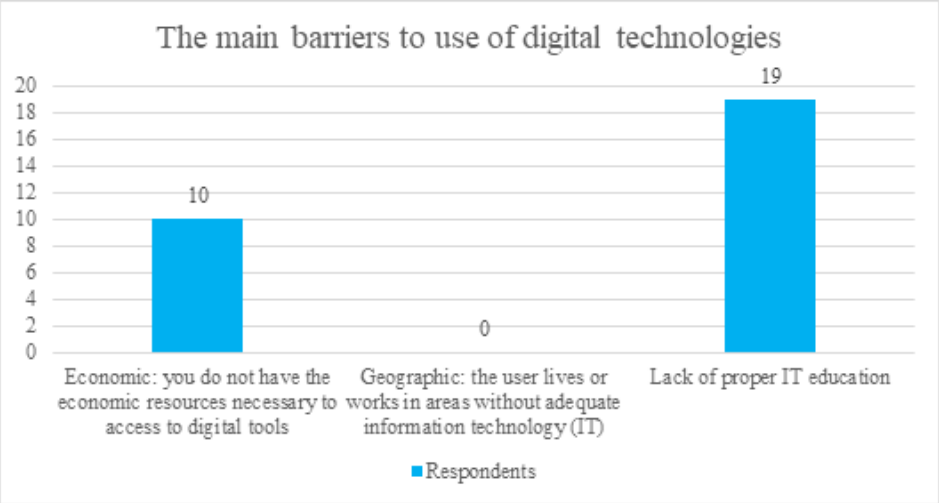

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Figure 68: the main barriers to use of digital technologies

7. *Respondents' frequency of learning on digital skills / technology* (Figure 69*):*

- 0 courses -11 respondents (42,3%)
- 1-2 courses -14 respondents (53,8%)
- 3-4 courses -1 respondents (3,8%)
- More than 4 courses - 0 respondents (0,0%)

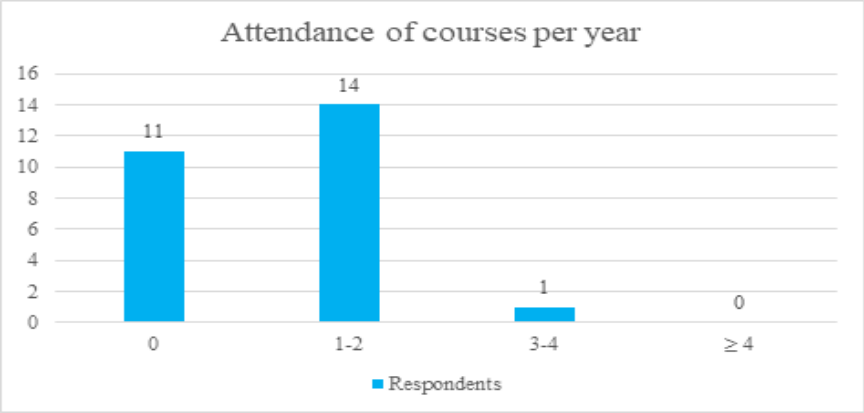

Figure 69: Attendance of courses per year.

8. *Reasons for not attending courses* (Figure 70):

- Registration fees at digital skills courses are too expensive - 7 respondents (53,8%)
- I don't have enough time to attend training courses- 3 respondents (23,1%)
- To date, I did not find training courses of my interest – 2 respondents (15,4%)

Comments: all the reasons, price, time, family.

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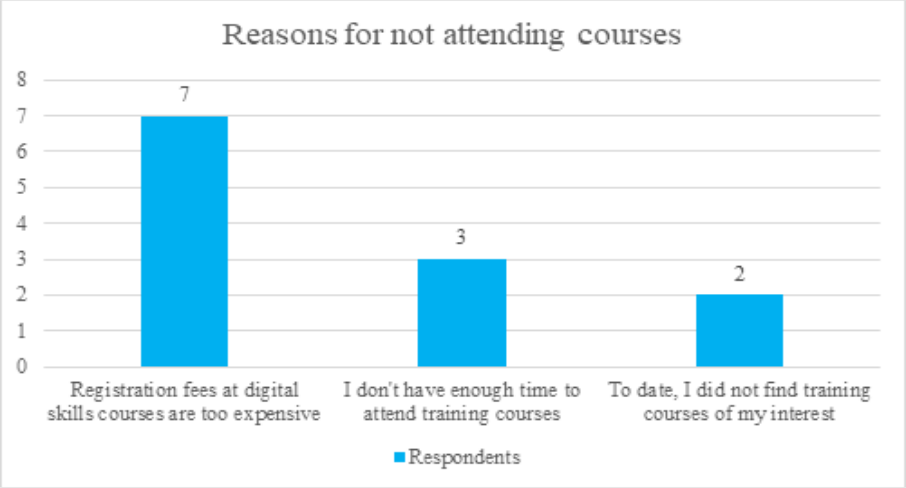

Figure 70: Reasons for not attending courses

9. *The need to teach more digital skills / assistive technologies*

All respondents (100%) felt that more training about digital skills/technology aids is needed for social/ healthcare workers.

10. *Is it necessary to have digital skills/technology taught in your workplace?*

All respondents (100%) said that digital skills/technology should be taught in their workplace.

12. *Digital skills/technology aids impact on work ability* (Figure 71):

- It would simplify/speed up daily activities -23 respondents (88,5%)
- It would provide me with additional and better options for my job -17 respondents (65,4%)
- It would not impact at all - 1 respondents (3,8%)
- I do not know 0 respondents (0,0%)

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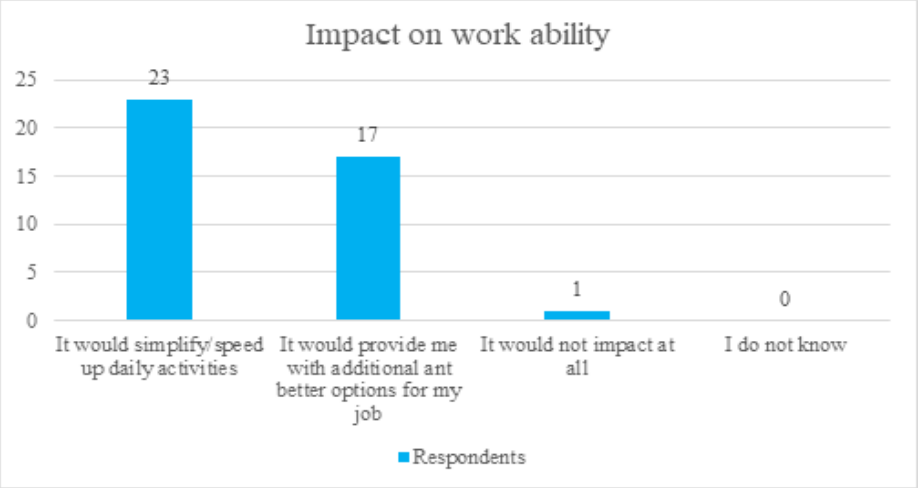

Figure 71: Impact of work ability.

13. *Digital skills respondents would like to learn* (Figure 72):

- Digital devices (e.g. tablet, PC, etc) -19 respondents (73,1%)
- Low tech assistive technology devices (e.g. switches, VOCAs, joystick, etc) -7 respondents (26,9%)
- High tech assistive technology devices (e.g. eyetracker) -10 respondents (38,5%)
- Assistive technology software (mobile Apps, AAC software, etc) -13 respondents (50,
- 0 %)
- Robotics -7 respondents (26,9%)
- Virtual Reality - 8 respondents (30,8%)

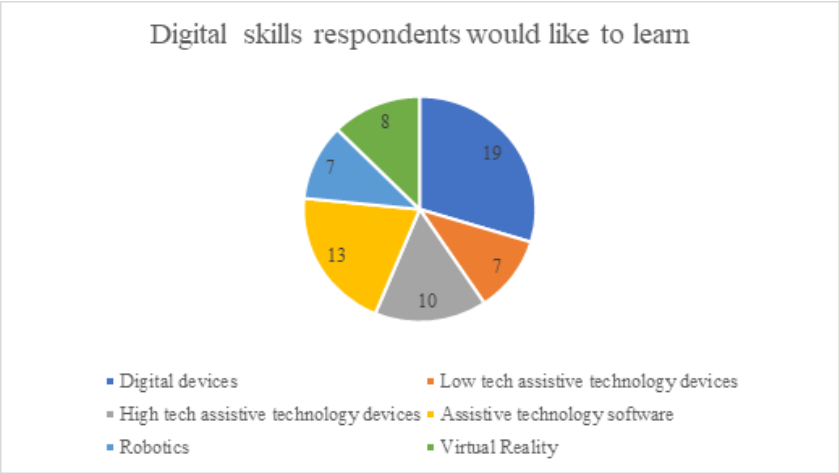

Figure 72: Digital skills respondents would like to learn.

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14. The motivation to learn digital skills/technology

All respondents (100%) said they would attend training workshops focused on digital skills/technology.

15. Request to be updated on training workshops news and events

All respondents (100%) said they would attend training workshops focused on digital skills/technology.

16. Main reasons to join a training course focused on digital skills/technology aids (Figure 73):

- General course programme - 15 respondents (55,6%)
- Expertise of the tutors - 7 respondents (25,9%)
- Topic (e.g. the kind of digital skill proposed) – 18 respondents (66,7%)
- Price - 18 respondents ((66,7%)
- Course duration - 15 respondents (55,6%)
- Availability of the technology within my workplace- 23 respondents (85,2%)

Figure 73: Reasons to join a training course.

17. *Organization of training courses (*Figure 74*):*

- An intensive week- 3 respondents (11,1%)
- Some weekends within the same month - 0 respondents (0,0%)
- Two days a month for some months -3 respondents (11,1%)
- One day a week for some weeks -21 respondents (77,8%)

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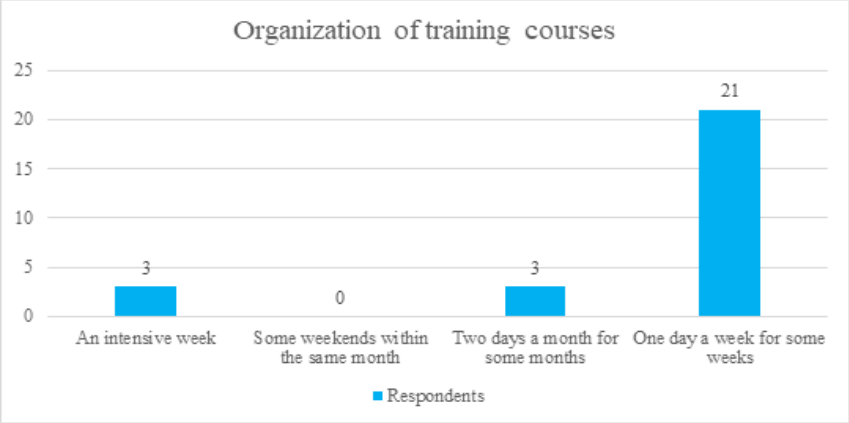

Figure 74: Organization of training courses.

18. *Preferred learning modalities* (Figure 75):

- Online training course - 1 respondents (3,7%)
- Face to face training - 10 respondents (37 %)
- Blended learning*: a combination of an online training ad a face to face training - 16 respondents (59,3%)

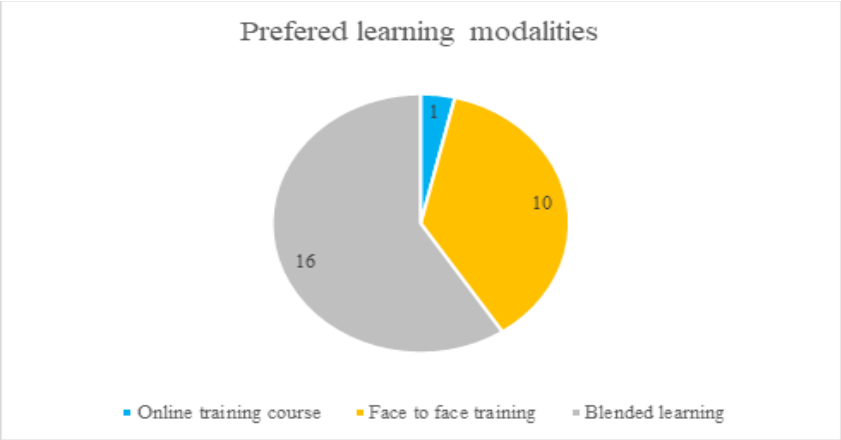

Figure 75: Preferred learning modalities

19. *Preferred online learning modalities* (Figure 76):

- Flipped classroom **- 14** respondents (51,9%)
- Mobile learning - 8 respondents (29,6%)
- Micro learning - 4 respondents (14,8%)

Comments: I would prefer traditional learning.

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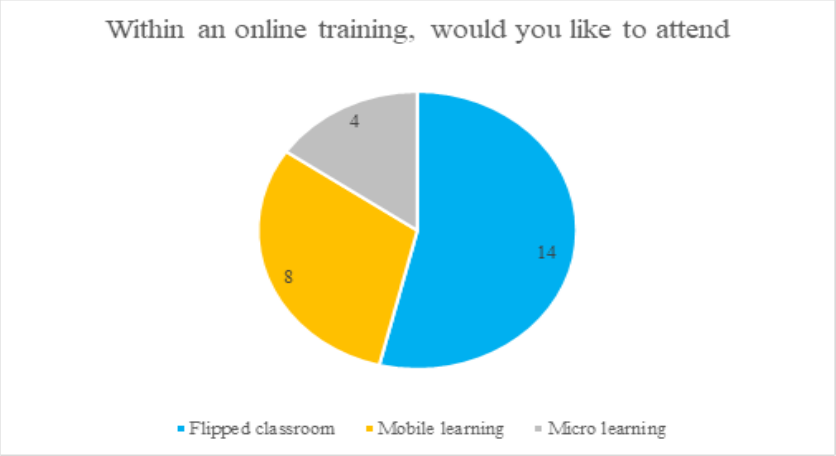

Figure 76: Preferred online learning modalities

20. *The ideal size of the trained group* (Figure 77*):*

- 5-10 learners - 25 respondents (92,6%)
- 10-20 learners - 2 respondents (7,4%)
- 20-30 learners - 0 respondents (0,0%)

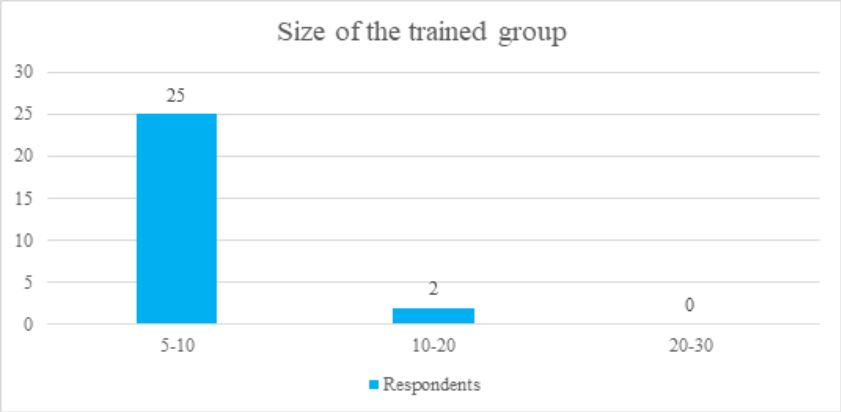

Figure 77: Ideal size of group.

21. *The most actual frontier technologies respondents are motivated to learn (*Table 3 and Figure 78*):*

Not all respondents understood how to answer questions No. 21. Just 11 respondents listed the preference in order. The rest only noted one preference.

The preference in order:

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	1. Technological Aids for domotic	2. Technological Aids for communication	3. Technological Aids for rehabilitation	4. Frontier technologies: Brain computer interface	5. Frontier technologies: Virtual reality	6. Frontier technologies: Robotic
Respondent N.1	2	3	6	1	5	4
Respondent N.2	2	5	3	4	1	6
Respondent N.3	3	2	4	6	5	1
Respondent N.4	2	1	3	1	6	5
Respondent N.5	6	2	3	1	5	4
Respondent N.6	2	3	1	5	6	4
Respondent N.7	2	6	3	5	4	
Respondent N.8	2	5	3	1	4	6
Respondent N.9	5	2	1	-	-	-
Respondent N.10	4	1	5	3	2	6
Respondent N.11	2	6	1	5	3	4
	No. 1 – 0	No. 1 – 2	No. 1 – 3	No. 1 – 4	No. 1 – 1	No. 1 – 1
	No. 2 – 7	No. 2 – 3	No. 2 – 0	No. 2 – 0	No. 2 – 1	No. 2 – 0
	No. 3 – 1	No. 3 – 2	No. 3 – 5	No. 3 – 1	No. 3 – 1	No. 3 – 0
	No. 4 – 1	No. 4 – 0	No. 4 – 1	No. 4 – 1	No. 4 – 2	No. 4 – 4
	No. 5 – 1	No. 5 – 2	No. 5 – 1	No. 5 – 3	No. 5 – 3	No. 5 – 1
	No. 6 – 1	No. 6 – 2	No. 6 – 1	No. 6 – 1	No. 6 – 2	No. 6 – 3

Table 3: Answers provided, in order of preference, by respondents about “frontier technologies” they would like to learn.

Other respondents did just choices:

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Technological Aids for domotic - 10 respondents (37%)

Technological Aids for communication – 12 respondents (44,4%)

Technological Aids for rehabilitation- 8 respondents (29,6%)

Frontier technologies: Brain computer interface - 6 respondents (22,2%)

Frontier technologies: Virtual reality - 9 respondents (33,3%)

Frontier technologies: Robotic - 6 respondents (22,2%)

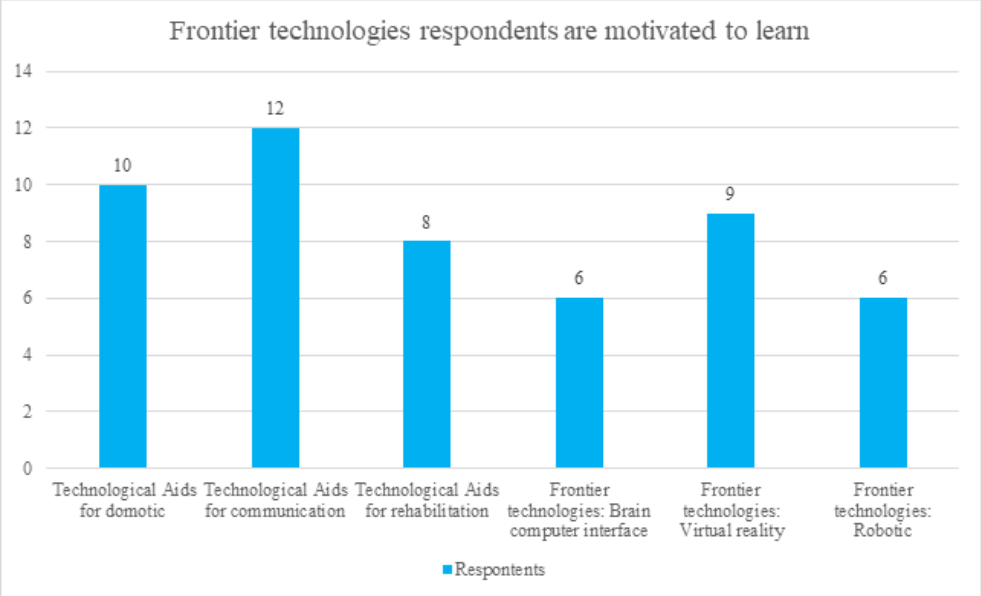

Figure 78: "Frontier technologies" respondents would like to learn.

*22. The learning outcomes most important to achieve (*Table 4 and Figure 79*):*

Not all respondents understand how to answer questions No 22.

Just 10 respondents listed the preference in order.

Other just made the choices

The preference in order:

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Practical Skills	Theoretical notions	General knowledge about existing digital tools
3	2	1
3	1	2
3	1	2
1	2	3
1	2	3
3	1	2
1	2	3
1	3	2
1	2	3
3	2	1
No. 1 – 5	No. 1 – 3	No. 1 – 2
No. 2 – 0	No. 2 – 6	No. 2 – 4
No. 3 – 5	No. 3 – 1	No. 3 – 4

Table 4: Answers provided, in order of preference, by respondents about the learning outcomes most important to achieve.

- Practical Skills - 16 respondents (59,3%)

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- Theoretical notions – 11 respondents (40,7%)

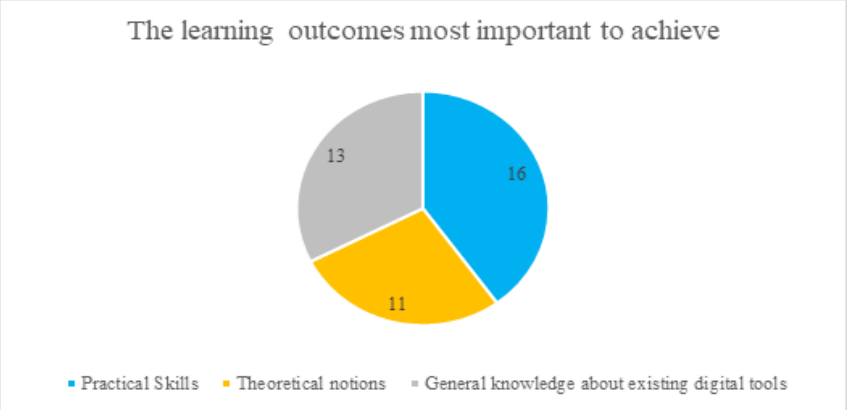

Figure 79: Learning outcomes considered as the most important to achieve.

Difficulties reported by participants in completing the survey:

1. I learned new information from the survey alone :)
2. Detailed questions and understandable answer options. The topic of the survey is really relevant.
3. I am not much exposed to high technology, so it was not easy to answer the questionnaire.
4. I don't even know exactly what is the most important and useful of these technologies.
5. First, general knowledge of high technology and digitization would be needed.
6. Really interesting and informative survey
7. Great poll.
8. The concepts - BCI, Virtual Reality, Robotics, Home Automation, should be explained at the beginning of the survey.
10. Informative survey.
11. The survey helps to understand how many opportunities we can achieve at work, we just need to pursue them.
12. A targeted survey helps to weigh up the competence of digital and smart technologies, to consider the possibilities of their use and the direct benefits for service users and their families.
13. Interesting and useful. It's like self-esteem. I think I still have a lot to learn.
14. I would like to deepen my digital knowledge.
15. Interesting survey. I think the answers received will make it possible to anticipate specific needs.
16. Of course. Short survey
17. I am ready and looking forward to training!
18. Training is needed

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19. The survey was interesting, I learned the meanings of new concepts.
20. A very sensitive topic, it would be good if there was a breakthrough in digitizing aid for the disabled
21. A useful survey that is important to our Institution.
22. Interesting. Only some IT programs are known only from TV shows, it is difficult to assess their need

vi. Digital skills demand among healthcare professional in Cyprus (MMC)

Methodological Design

The survey was conducted online by converting the provided questionnaire into a Google form. M.M.C. contacted potential participants working in the health and social care with people with disabilities or mental health issues initially by telephone and then by e-mail, sending them the relevant link along with information about the project and the aim of the particular survey. The online survey took place on 5-18 June 2020 and finally eleven (11) persons filled in the online questionnaire.

Demographic Characteristics

*Age (*Figure 80*)***:** Six (7) persons were between 30 and 40 years (63,6%), two (2) persons were between 50 and 60 years (18,2%), one (1) person was between 20 and 30 years (9,1%), and one (1) person was between 40 and 50 years (9,1%).

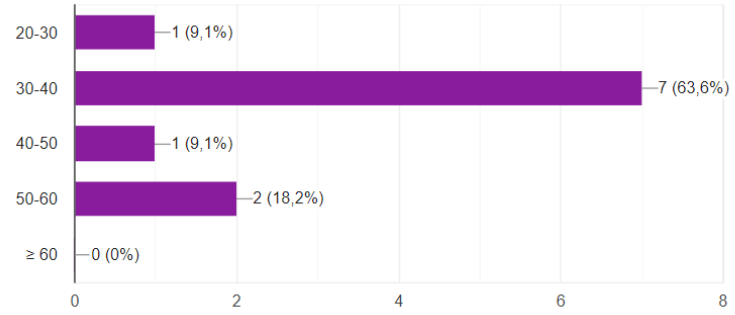

Figure 80: Age of participants.

Profession and main duties: Among the participants, there were four (4) social workers working with people with disabilities, one (1) clinical psychologist working with adult general population with psychological difficulties ranging from mild anxiety and phobias to schizophrenia, one (1) senior occupational therapist (working for the last 25 years), supervising OT in the Mental Health Department of the Cyprus Ministry of Health, one (1) special education teacher, one (1) nursing student currently working in geriatric institutions and doing clinical practice in the General Hospital of Nicosia, one (1) manager in

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day care centre for people with intellectual disabilities, one (1) head of vocational rehabilitation programs in day care centre, providing vocational education and training to adults with intellectual disabilities and one (1) sales and patient services supervisor.

Results of the Survey

The results are described below in the order of the provided questionnaire. Questions from 1 to 15 explored the social workers' expertise on digital skills/ technology aids and their training needs, whilst those from 16 to 22 investigated their views on how a training course on digital skills/technology aids should be organized, and the characteristics it should have.

1. Nine (9) participants answered the question "Do you usually use digital tools in your work?" with "Yes" (81,8%) and two (2) participants with "No" (18,2%) (Figure 81).

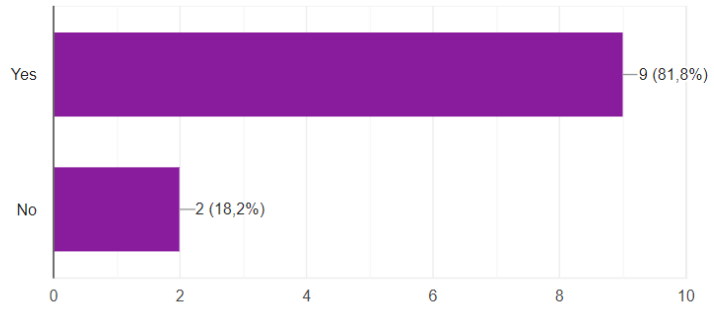

Figure 81: Use of digital tools in work.

2. Among the ten (10) participants who answered "Yes" in the previous question, eight (8) persons currently use "digital devices" in their workplace (80%), one (1) person use "low tech assistive technology devices" (10%), two (2) persons use "high tech assistive technology devices" (20%), five (5) persons use "assistive technology software" (50%), while one (1) person answered "ambient assisted living" (10%). "Robotics", "Virtual Reality", "Domotics", and "Brain Computer" Interface items were not selected at all. Multiple answers were possible in this question (Figure 82).

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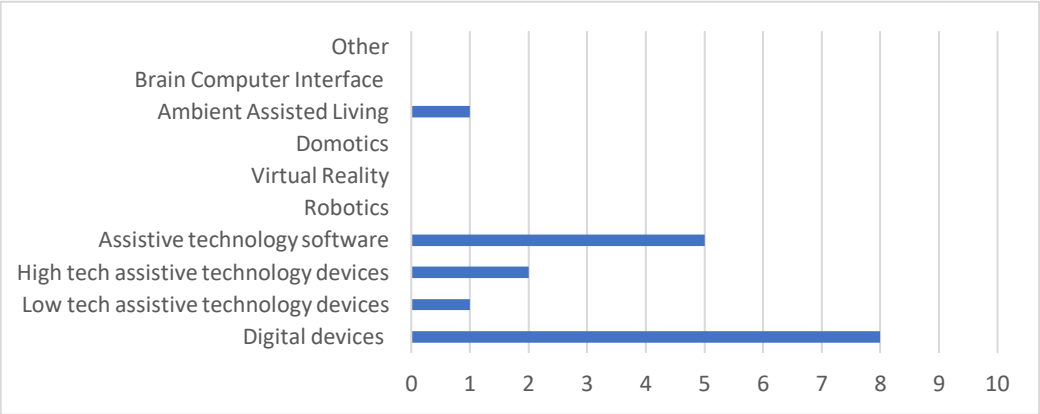

Figure 82. Use of digital skills/technology aids

3.The question "How effective do you rate technological tools for persons with disabilities or old aged, considered as elderly people and, more in general, persons in need?" was rated with "A lot" by two (2) participants (18,2%), "Quite a lot" by six (6) participants (54,5%), "Not much" by two (2) participants (18,2%), and "Not at all" by one (1) participant (9,1%) (Figure 83).

Some comments on the above question were as follows:

a. *Technology in our work is a key tool of communication/employment/entertainment (of the patients);*
b. *Technological tools can be very effective to both the elderly and people with special needs, because technology can increase their independence and their communication skills, can broaden their imagination and creativity, and can even increase their motor skills;*
c. *Extremely difficult to use, especially elderly people due to their lack of any previous experience and quite often their resistance to acquire new technological skills; and*
d. *Very effective for therapists, but it depends on the intellectual ability of the patient.*

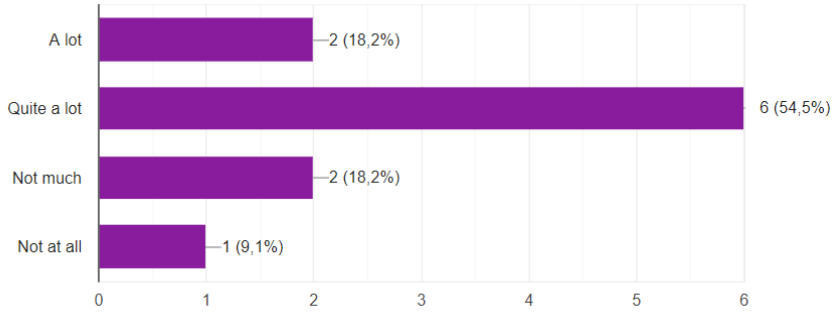

Figure 83. Considered effectiveness of technological tools

4. Ten (10) participants out of eleven (11) said that Covid-19 had contributed to the implementation of more technology and digitalization in their work process. Among the ten (10) respondents, six (6) mentioned that they experienced this regarding "remote work" (60%), four (4) regarding "distance learning"

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(40%) and two (2) regarding “telehealth” (20%). Multiple answers were possible in this question. (Figure 84).

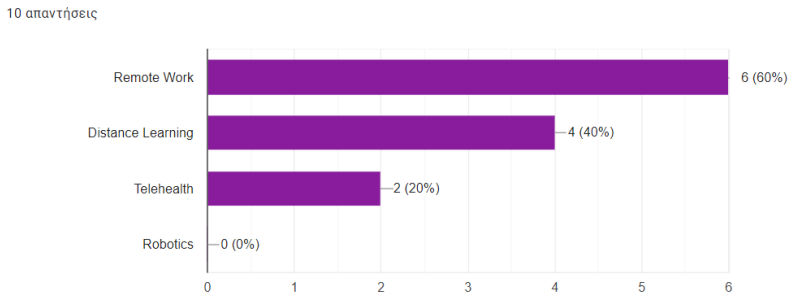

Figure 84. Kind of technology and digitization affected by Covid-19

5. Ten (10) out of eleven (11) participants (90,9%) said that they felt qualified to handle technology aids they work with, while one (1) answered this question with “No” (9,1%). (Figure 85).

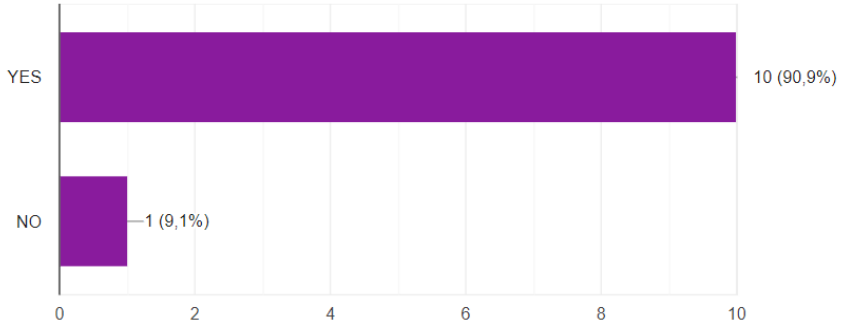

Figure 85. Considered qualification to handle technology aids working with

6. On a scale of confidence with digital skills/technology aids of 1 to 10 (1 - Low, 10 - High), all eleven (11) participants voted with an average 8 (out of 10), with range from 5 to 10 (1X5, 1X6, 1X7 (9,1% each), 4X8 (36,4%), 3x9 (27,3%), and 1x10 (9,1%) (Figure 86).

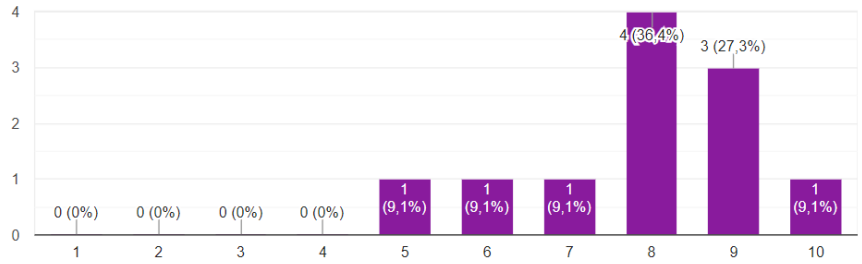

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Figure 86: Confidence with digital skills/technology aids

7. The question "In your opinion, what are the main barriers to the use of digital technologies?" was answered by seven (7) persons with "economic reasons (no access to digital tools)" (63,6%), by two (2) persons with "geographic reasons (no adequate information technology (IT) infrastructure)" (18,2%), by seven (7) persons with "lack of proper IT education" (63,6%), and by one (1) person with "others" (9,1%), without providing any comments. Multiple answers were possible in this question. (Figure 87).

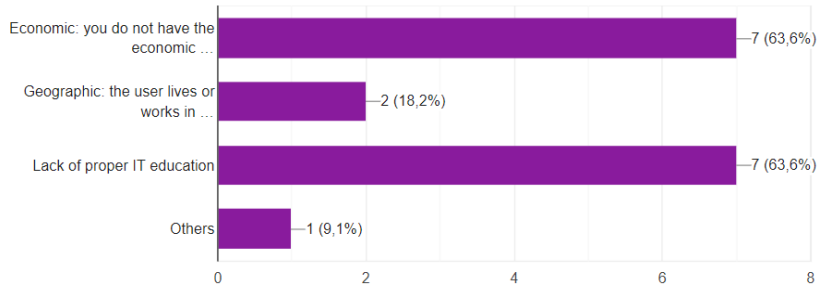

Figure 87: Main barriers to use digital technologies.

8. Six (6) out of eleven (11) participants do not attend any courses on digital skills/technology aids per year (54,5%), while three (3) persons attend 1-2 courses per year (27,3%), and two (2) persons attend more than 4 courses per year (18,2%). The item 3-4 courses per year did not receive any answers. (Figure 88).

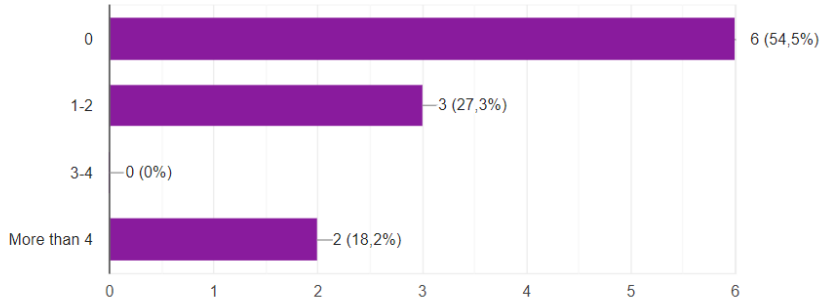

Figure 88: Attendance of courses per year.

9. Out of the six (6) participants that answered that they do not attend any courses on digital skills/technology aids per year, one (1) person named as reason for this the too expensive registration fees (16,7%), two (2) persons the lack of time (33,3%), two (2) persons the fact that

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they do not find courses of their interest (33,3%), while two (2) persons answered that this happens due to other reasons (33,3%), without providing any comments (Figure 89).

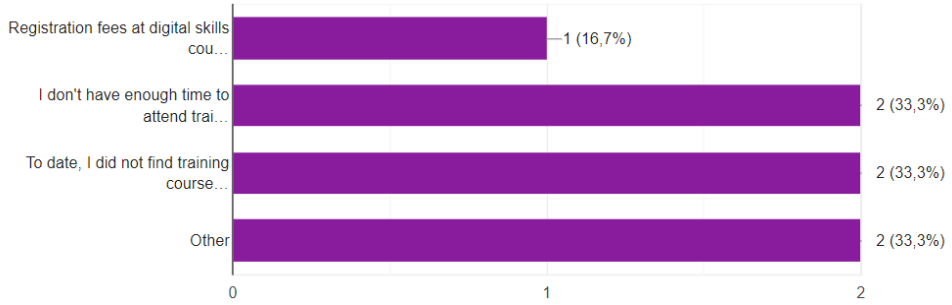

Figure 89: Reasons for not attending courses.

10. All eleven (11) participants answered that more training about digital skills/technology aids is needed for social/healthcare workers. One (1) person commented that such training needs to be closely monitored in order to be effective.
11. All eleven (11) participants answered that digital skills/technology aids should be taught in their workplace. The working fields mentioned are the following: disabled care, mentally disabled care, old age care, rehabilitation, nursing, education, psychology, health management.
12. All eleven (11) participants saw a positive impact of training about digital skills/technology on their ability to do their job. Nine (9) of them said it would simplify or speed up daily activities (81%) and ten (10) that it would provide them with additional and better options for their job (90,9%). Multiple answers were possible in this question (Figure 90).

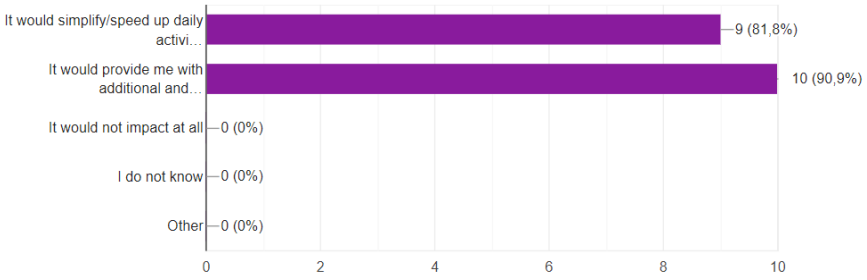

Figure 90: Impact of training.

13. To the question “What kind of digital skill do you think might be most effective for your job or you would like to learn/improve?”, nine (9) persons answered “digital devices (e.g. tablet, PC, etc.)”

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(81,8%), four (4) persons answered “low tech assistive technology devices (e.g. switches, VOCAs, joystick, etc)” (36,4%), three (3) persons answered high tech assistive technology devices (e.g. eye tracker)” (27,3%), seven (7) persons answered “assistive technology software (mobile Apps, AAC software, etc.)” (63,6%), three (3) persons answered “robotics” (27,3%), and three (3) persons answered “virtual reality” (27,3%). Multiple answers were possible in this question. (Figure 91).

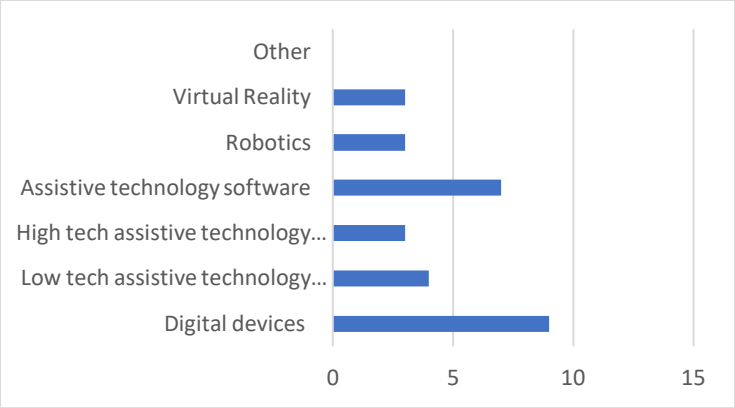

Figure 91: Digital skills participants would like to learn/improve.

14. All eleven (11) participants said that they would attend training workshops focused on digital skills/technology.
15. Ten (10) participants said that they would like to be updated on training workshops news and events, while one (1) participant answered this question with “No”.
16. As necessary elements of a training course on digital skills/technology aids in order for participants to join, five (5) persons considered a general course programme (45,5%), five (5) persons the expertise of the tutors (45,5%), seven (7) persons the topic of the course (kind of digital skill proposed) (63.6%), six (6) persons the price of the course (54,5%), five (5) persons the duration of the course (45,5%), and (6) persons the availability of the technology within their workplace (54,5%). Multiple answers were possible in this question (Figure 92). One (1) participant commented that irrespective of the specific elements of a course, sometimes the lack of time on behalf of health care professionals prevent them from taking part in such courses.

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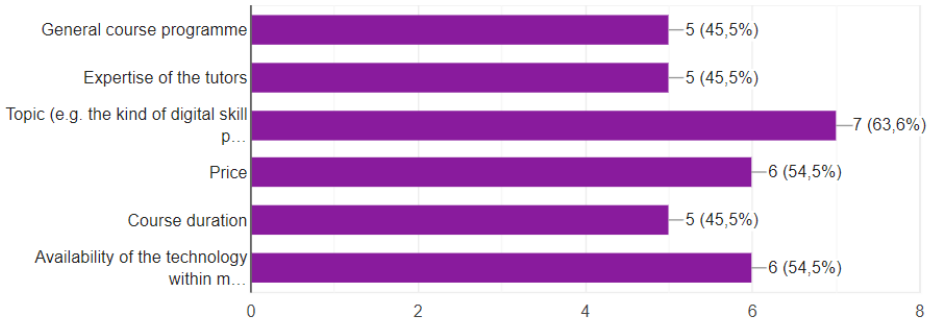

Figure 92: Necessary elements of a course for participants to join

17. For the organisation of the course, six (6) participants answered that an intensive week would be more appropriate (54,5%), two (2) participants that they would prefer some weekends within the same month (18,2%), two (2) participants voted for two days a month for some months (18,2%), and four (4) participants for one day a week for some weeks (36,4%). Multiple answers were possible in this question. (Figure 93). One participant commented that the option of an intensive week would help the participants not to forget what is being taught from session to session, but this is depended on the topic of the course. Another (1) participant mentioned that there should be time between the different sessions for application of what is being taught.

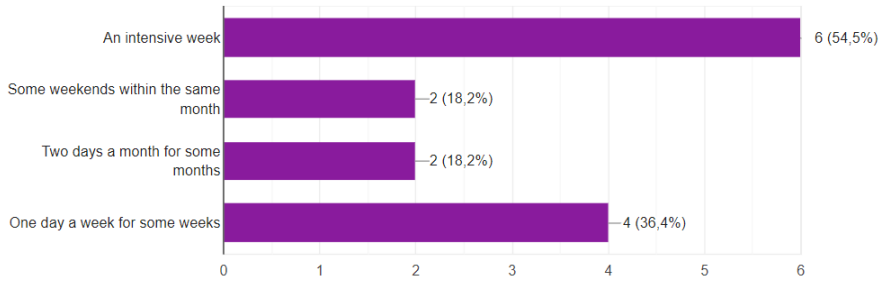

Figure 93: Organisation of the training course.

18. Five (5) participants voted for online training courses as preferred mode of training (45,5%), four (4) participants for face to face training (36,4%), while seven (7) participants preferred a blended learning approach, combining online and face to face training (63,6%). Multiple answers were possible in this question (Figure 94). One participant commented that a combination of online and face-to-face training might work better, with the face to face part being used for the tutor to answer questions that need a hands-on approach.

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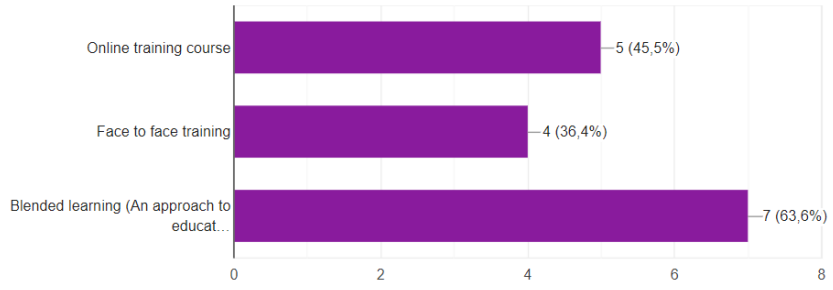

Figure 94: Preferred mode of learning.

19. In the case of online learning, six (6) persons would prefer to attend flipped classroom (54,5%), seven (7) persons mobile learning (58%), and five (5) persons micro learning (45,5%). Multiple answers were possible in this question (Figure 95). One participant mentioned that a combination of flipped classroom and mobile learning might work better and that flipped classroom could be used for the tutor to answer questions that need, too, a hands-on approach. Another participant highlighted that all modalities are effective and the decision should be based on the topic of the course.

Figure 95: Preferred online learning modalities

20. Ten (10) out of eleven (11) participants chose groups of 5-10 persons as ideal size for the trained group, while one (1) participant voted for groups of 20-30 persons (9,1%). The options of groups of 10-20 persons or of any other size did not receive any answers. (Figure 96).

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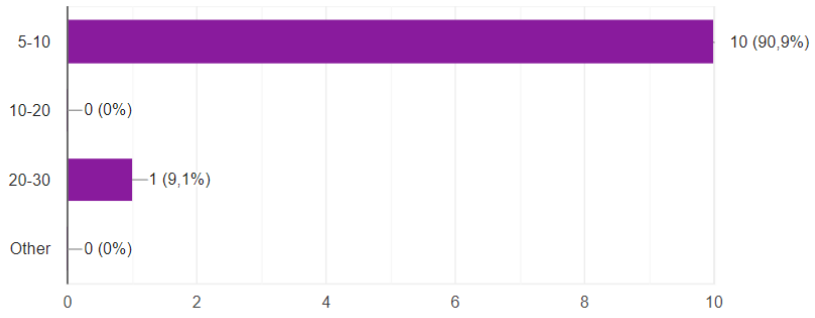

Figure 96: Ideal size of the trained group in face to face learning

21. Among the topics that should be included in the training, the participants listed the topics in the following order of preference (multiple answers were possible in this question):
    1. Technological Aids for communication;
    2. Technological Aids for rehabilitation;
    3. Frontier technologies: Brain computer interface; and
    4. Technological Aids for domotic, Frontier technologies: Virtual reality, and Frontier technologies: Robotics.
22. Regarding the most important learning outcomes to be achieved, all eleven (11) participants ranked the provided learning outcomes as follows (multiple answers were possible in this question):
    1. Practical Skills;
    2. General knowledge about existing digital tools; and
    3. Theoretical notions.

Regarding any difficulties in completing this survey, one (1) participant mentioned that the kind of comments expected by participants, in case of questions asking for comments apart from selection one of the proposed answers, was not clear.

c. Discussion and conclusion

To identify both social workers' training course needs and their knowledge on the use of technology aids that increase autonomy of people with disabilities and mental health problems, some DDskills Partners

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(FSL, FRA-UAS, JDC, and MMC) led a survey, while others (NUIG and to Ergastiri) conducted online Focus Group.

Each Partner enrolled at least 10 social workers (i.e. occupational therapists, psychologists, nurses, gerontologists, speech therapists, physical therapists, medical doctors, special education teachers, social pedagogues, and curative educators), aged over 18 years, working in different fields, such as nursing care, neurorehabilitation, educational and disability field and so on.

Overall, eighty-six social/healthcare professionals were recruited.

Both survey and Focus Group were divided into two sessions: the first collected information on digital skills' knowledge and training needs of social workers, while the second investigated their views on how a training course on digital skills/technology aids should be organized, and on the characteristics it should have.

Almost all participants declared to use digital tools/technology aids in their workplace, and the range of technologies mostly used included: digital devices (tablets, mobile devices, laptops), low tech assistive technology devices (e.g. switches, joysticks, motorised wheelchairs), and assistive technology software (mobile Apps, AAC software, etc). VR, robotics, domotics, AAL, and BCI were found to be the least used technologies. Most of them (around 70%) affirmed to feel qualified enough to handle technology aids they work with, even though more education and training on this topic are needed for social/healthcare professionals.

Indeed, 60% of all participants declared to not attend any courses on digital skills/technology aids per year, mainly because of the lack of interesting offered courses, followed by the lack of time and the expensive registration fees.

All participants agreed that digital skills/technology should be taught in their workplace, since they would provide them with additional and better options for their job (option chose by 75,58% of participants), and they would speed up their daily activities (56% of participants) (multiple answers available for this question).

As for the kind of digital skills considered as most effective for their job, participants listed in order of preference: digital devices, assistive technology software, VR, robotics, low tech assistive technology devices, high tech assistive technology devices, and BCI.

All participants expressed that they would like to attend training workshops focused on digital skills and technology aids, and to be updated and notified on training workshops and events in this field.

Regarding the second session, when asked the healthcare professionals the reasons to join a training course on digital skills/technology aids, they reported, in order of preference: topic, price, and general course programme, availability of the technology within their workplace, course duration, and expertise of tutors. They also indicated the "blended learning" approach (67%) as preferred learning modality, followed by online (28%) and face to face training (21%) (Multiple answers available for this question). Thirty-nine out of eighty-six social/healthcare professionals (45%) answered that the option of "one day

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a week for some weeks" could be the best one as organization of the course, as they reported to prefer a training more staggered.

In case of online courses, all healthcare professionals indicated that they would be interested in flipped classroom (57% of them), followed by mobile learning (43%) and micro learning approach (29%) (Multiple answers possible also for this question).

Among the "emerging technologies" that should be included in the training, almost all participants, except for those working in the neurorehabilitation field, indicated "technological aids for communication" as their greatest priority. The other options were chosen, according the following order of preference: technological aids for domotic, technological aids for rehabilitation, robotics, VR, and BCI.

In relation to their intended learning outcomes from attending training, participants affirmed that theoretical notions and general knowledge about existing digital tools were important for them, but improving practical skills in everyday work is their priority.

In conclusion, healthcare professionals working with people with different disability showed a strong interest to learn and improve both knowledge and skills on digital tools/technology aids, considered as promising approach that may increase autonomy of people with disabilities and mental health disorders. However, our results revealed that a high percentage of them declared to not attend any courses on this field per year, mostly due to the lack of interesting courses on this topic, indicated as the main reason to choose and join a training course. Consequently, there is a need to realize vocational training programs better tailored on digital tools/technology aids, in order strengthen the educational curricula of healthcare professionals.

3. MOOC and e-learning institutions

The third aim of Task 3.1 was to identify international MOOC and e-learning institutions providing digital skills training courses and certifications for the health and social care sector.

To reach this aim Partners performed a cooperative web search. Firstly, we identified the main international e-learning platforms; afterwards, each Partner indicated the courses on the targeted Digital Skills supplied by the platforms. As in the previous search, the pivotal Digital skills were robotics, VR/AR, Smart Home, AAL, eHealth, AT, AAC, BCI, Telemedicine, Sensors.

The first list of the main e-learning platforms was the following: Adobe Captivate Prime, Alison, Cognitive Class, Codelabs, Coursera, Docebo, edX, Federica.EU, FutureLearn, Iversity, SAP Litmos, SkillShare, Trio, Udacity, Udemy, WizlQ. Other Platforms found in the search process were: UrAbility, HomeMentors.com, Springboardcourses, OnlineTherapyInstitute, AAC Institute.

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In the above-mentioned platforms, we found 15 courses (*Table 3),* all held in English language: among them, three were about VR, one was about smart home, one on eHealth, one was focused on AT, one on AAC, one was on BCI, three about Robotic, and one about Artificial Intelligence.

Regarding the professions listed as course participants, psychologists were reported in two courses, and special education teacher in one. Ten courses did not specify any profession. Persons in needs were specified in the description of only 5 courses (3 mental health, 2 old aged).

	N. of courses
Coursera	2
edX	3
FutureLEarn	3
Udemy	2
UrAbility	1
HomeMentors.com	1
Springboardcourses	1
OnlineTherapyInstitute	1
AAC Institute	1

Table 5. Main international e-learning platforms.

4. Frontiers AT

a. Brain-Computer Interface

Brain-Computer Interfaces measure signals related to specific brain activity and translate them into outputs to control external devices for a range of applications, such as communication, environmental

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control, movement control, and motor rehabilitation (Wolpaw and Wolpaw, 2012). Currently, BCIs are not available in the portfolio of AT-centers for full deployment to end-users, even though BCI technology could improve the inclusiveness of AT solutions. Also, BCI is rarely part of the rehabilitation path.

Target group (users) in a BCI context needs an integrated approach to be defined. Based on the User-centered design (UCD) approach, we can identify three types of BCI users: *end-users* (or primary users), as persons in needs who use the product; s*econdary users*, who use the product occasionally or through an intermediary; and *tertiary users* (professional users or other stakeholders), who are affected by the use of the product or make decisions about its purchase.

In a clinical background, this definition implies the involvement of several professional and non-professional figures: caregivers, medical doctors, therapists, healthcare providers, psychologists, engineers, companies together with the end-users, namely persons with disabilities or patients undergoing the rehabilitation (Riccio et al., 2016).

Many BCI applications could be relevant to health care professions (Wolpaw, 2020):

- Replace: BCI output could replace muscle control lost to injury or disease. Examples of applications could be controlling a motorized, enable someone who cannot speak.
- Improve: BCI output could potentially improve natural Central Nervous System (CNS) output, by supporting the motor rehabilitation. A BCI might measure activity in the damaged cortical area during attempted and use it as feedback. This strategy might guide activity-dependent plasticity that restores more normal movement control.
- Restore: BCI output could restore lost muscle control, by using a BCI that stimulates the paralyzed muscles through implanted electrodes.
- Enhance: BCI output could enhance natural CNS output. It could thereby enhance the individual's normal capacity for continuous attention.
- Supplement: BCI output could supplement natural CNS output. A person might conceivably control a third (robotic) arm with a BCI.

The desk research on current courses including the BCI topic in Cyprus, Germany, Greece, Ireland, Italy and Lithuania showed only six results for training courses on BCI (2,9% of the total courses on Digital skills) performed in the last 3 years. At least one course was found per each country, except for Cyprus, where

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it is possible to join two BCI courses in two Master of Science (MSc) (in cognitive neurorehabilitation and biomedical engineering).

According to these results, BCI technologies were used very rarely in the activities of the professionals who were involved in the survey. Although many BCI prototypes have been developed and evaluated in the laboratories, only a few BCI systems are available on the market.

We can conclude that it is very important to inform professionals working with people with disabilities on the developments of BCIs devices, to better understand their strength and limitations.

This would be a step to consolidate the accessibility of BCI technology.

b. Robotic

Although there is a range of robotic systems already available, they are not very much present in the social sector. A recent analysis of robotic systems identifies different types of robots and different application areas such as hospitals, rehabilitation, nursing care homes and the private home (Klein et al., 2018). Target groups for robotic systems comprise different professions (physicians, nurses, therapists, activity coordinators, domestic staff etc.) and different client groups. For DDSkills relevant robotic systems could be:

- Telepresence robots allow communicating over a distance with relatives, but also with physicians or professional caregivers. Here, a variety of products are already on the market and beyond the prototype status.
- Emotional robots (like robot pets) are utilized for activation and therapy e.g. in dementia care, for people with unresponsive wakefulness or with autism.
- Service robots (mostly humanoids) can talk, give information and activate by singing or doing memory games or gymnastics. Although there are some products on the market such as NAO or PEPPER, they require a lot of technical attention. Up to now, if these robots are utilized in Europe, they are not equipped with standard applications. In fact, the required application has to be developed and programmed.
- Robotic systems for rehabilitation and training - There are different robotic systems available which support the training of motor abilities such as walking or hand function e.g. after a stroke.

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- Robotic assistive devices which support people with functional loss. In Germany for example, the statutory health insurance provides exoskeletons to paralyzed persons in order to enable them to walk or provides robotic feeding systems or robotic arms in order to enable activities of daily living.
- Robotic systems which support work processes of nursing and care staff are e.g. intelligent lifters for transport and lifting persons. An intelligent care cart can bring care utensils to the resident or patient, monitors the usage and supports documentation.
- Logistic and transport systems in form of robotic laundry or meal trolleys support domestic tasks.
- Cleaning or disinfection robot systems support cleaning tasks, mainly in hospitals.

The desk research on current courses for caregivers in Cyprus, Germany, Greece, Ireland, Italy and Lithuania showed only one result for training courses on robotics. The course was found in Italy and it dealt with the topic how humanoid robots could be integrated in therapy of persons with intellectual disabilities.

In accordance with these results, only participants of the survey in one country, also in Italy, reported the use of robotic systems at work. Reasons might be that those respondents work in neurological rehabilitation.

The results reflect the current situation of robotic systems in the social care system. Only few robotic systems are available on the market, many are still prototypes. Most common are robotic systems for rehabilitation of motor abilities. In the field of emotional robots, more products come into the market. The robotic plush seal PARO which is on the market since 2005, has been sold just about 200 times in Germany up to date. Products such as JustoCat®, a robotic plush cat or robotic toys are more inexpensive alternatives. No figures are available on their prevalence.

Telepresence robots are commercially available and mostly easy to use as experiences in the Independent Living Centre and the Innovation Lab 5.0 at Frankfurt UAS show (Knopf et al. 2015; http://www.youtube.com/barrierefreieswohnen). However, in the healthcare sector these systems can be hardly found. The Corona-crisis might contribute to a wider dissemination as they could support in many communication tasks in institutional settings such as virtual visits of relatives, medical doctors etc.

With respect to social robots, there are a range of pilot projects funded by EU and national funding bodies. The purpose of these projects was to develop the robot and evaluate them in healthcare settings. These

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robotic systems comply with a technology readiness level of 5 to 7, thus not commercially available. The humanoid robots NAO and PEPPER are commercial products and mainly targeted to schools and universities in order to train robotic skills. However, there are a range of projects in the healthcare sector utilizing these robots although hardly any commercial applications are available. If healthcare institutions in Europe decide to utilize such a robot, they need resources in order to program the appropriate solution.

Robots that can assist persons with disabilities or caregivers by bringing individual goods or overtaking complex domestic tasks are still in the field of research and development (Klein et al., 2018). Therefore, it is not surprising that only one vocational training was found for healthcare and social care professionals.

However, due to the rapid technological developments it is more than important to inform nursing and care staff as well as caregivers on these developments in order to sensitize them for the possibilities and limitations of robotic systems. This can contribute to achieve a better understanding of what robots can and cannot do, thus overcoming anxieties such as robots would replace staff.

The experiences in the Independent Living Centre and the Innovation Lab 5.0 at Frankfurt UAS show that practicing interaction with robots facilitates decision making and discussion on ethical and social issues. It also provides an insight in current possibilities in this field.

c. Virtual Reality

Virtual Reality (VR) refers to a range of computing technologies that present artificially generated sensory information in a form that people perceive as similar to real-world objects or events (Wilson, Foreman, & Stanton, 1997). The use of VR technologies has gained a lot of support, within applied and empirical literature, for the use of persons with additional needs. A unique factor of VR is that the user can explore and interact within the virtual environment so that the user can almost feel present within a stimulated world. This allows users to experience some opportunities that are not frequently present in their own typical environment or are perhaps inaccessible for particular reasons. Such technologies can serve to establish environments for people to practice and learn socially significant skills (e.g., negotiation skills), as well as learn functionally relevant repertoires (e.g., playing sports).

Across participating countries there were limited courses identified in VR and of those identified, the courses were not reported to be long in duration. In addition, VR is not commonly used within services, with only a small number of professionals using VR within their current work. Interestingly, a high

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proportion of participants considered it important to learn about VR, even those these technologies were not readily used across services. This could be reflective of professionals having an understanding of the utility of VR but not having direct experiences of the equipment and the potential for its use. It may be an important factor to consider when promoting VR for clinical practice. Professionals would benefit from courses on VR technology (i.e., experience of how it works) and then the application possibilities across skills and populations, so that they can best understand how VR could be used and adapted to suit the needs of their client group.

In terms of considering missing elements of training in VR, it is important to reflect on the general information gathered from the focus groups, as within this forum, professionals were given the opportunity to reflect on training and provide information on elements that would enhance the impact it for their clinical use. VR training would need to be delivered in a systems wide approach that provided instructional and practice sessions across professionals, support staff, and family members, to ensure the technologies are used consistently and effectively used across environments for individuals with additional needs.

In addition, it is important that training in VR technologies should always include practice sessions directly with the devices (i.e., trialing the devices on themselves and role playing with others). Furthermore, opportunities to troubleshoot issues that may arise when using such technologies should also be included within training courses. The technical aspects of the devices can be considered a challenge, so ensuring users and facilitators are confident and comfortable in the use of the technical equipment is a very important element of any training package.

Professionals reflected on the importance of training to include an overview of the various applications of VR technologies for their practice but also how VR can be used for the benefit of users who present with differential diagnosis. Providing a broad overview of the applications of VR across populations allows professionals to consider the adaptation of VR for their clinical use and also potential future uses. Currently, there is no centralized system that presents the various devices and the potential applications of those technologies. Each company presents their own unique offerings and it falls to professionals to spend time researching and collating information in an effort to inform their own practices. Training in VR should provide a broad list of companies, technologies and applications for use. Furthermore, it would be useful to classify the available VR applications per professional category or per repertoire (e.g., social skills). More specifically, within a psychological/behavioral perspective training would be provided on the

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VR systems that, for example, supports development of social skills or addresses systematic desensitization for fear/phobias. Within the field of occupational therapy and physiotherapy, information could be provided on the VR applications could be presented that serve to support the development of functional life skills or provide movement/exercises that would form part of rehabilitation or treatment for physical disabilities.

In addition to gaining an understanding of the applications of VR across repertoires and differential diagnosis, it is important for professionals to have a clear understanding of pre-requisite skills for users to have before using VR. Being able to assess for these pre-requisite skills will serve to ensure that users will potentially benefit from the use of VR. Should pre-requisite deficits be identified, then clinical teams have the option to consider the overall treatment plan and teach pre-requisite skills prior to implementing VR.

Budgetary costs are a consideration for treatment plans and it is of consideration to provide training supports on pricing treatments using VR, to support professionals to understand the cost benefit ratios of the use of such technologies, as well as the multiple applications of the equipment across clients. This might serve to ensure that VR technology becomes more accessible to services.

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