MOVE-IT TRAINING GUIDELINES

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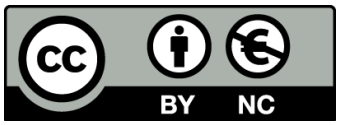

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1. Erasmus +, Sustainable Development Goals and MOVE-IT project.

1.1. Introduction.

MOVE-IT (Development of a training program for improving physical exercise of People with Intellectual Disabilities (PwID) through exergames and technology) is a project executed within the Erasmus+, a program for education, training, youth, and sport. It aims to support initiatives and projects that promote learning opportunities, foster cooperation, and contribute to the personal development of individuals.

MOVE-IT is a project developed under the key action KA220-ADU, cooperation partnerships in adult education. The partnership is leaded by the Spanish partner (Universitat Politécnica de Valencia – UPV)) and formed by other 4 partners from 4 countries: Instituto Valenciano de Servicios Sociales, IVASS (Spain), CERCIOEIRAS, CRL (Portugal), Ospedale Riabilitativo di Alta Specializzazione (Italy) and Universitetet I Tromsoe Norges Arktiske Universitet (Norway).

This project aims to create, develop, and validate a new learning program tailored to the needs of disability professionals and relatives to promote the use of exergaming through new information and communication technologies (ICT) in people with mild to moderate intellectual disabilities.

Besides this main aim, the project has the following specific objectives addressed to persons with intellectual disabilities:

- To promote their healthy lifestyle and social inclusion.
- To reduce their disparities in access to and engagement with digital technologies.
- To extend and develop their competences in the use of digital tools.
- To support the development of their basic digital skills.

To achieve the mentioned objectives, MOVE-IT has developed a set of pedagogical materials and carried out several training activities.

Within the project, as it can see in Table 1, the partnership has developed:

- Project result 1. This result consists of a toolkit that allow the professional staff working with PwID, and the relatives to improve their competences related to the implementation of Physical Exercise routines with the support of ICTs.
- Project result 2. The main contribution of this result to the project is to provide 2 exergames solutions (AGA and Sorterius) that are customized made for PwID.
- Project result 3. The present document is a booklet depicting the MOVE-IT model of the non-formal training. In addition, it includes the training guidelines, as well as the evaluation methodology and tools developed within the project. The document also includes how the pilots have been carried out.

Project Result	Target audiences	Languages
PR1 Manual on physical activity, intelectual disability and technology	• Educators and other direct care professionals in the field of intellectual disabilities. • Designers and coordinators of training actions and programmes.	English Italian Norwegian Portuguese Spanish
PR2 Apps for promoting physical activity	• People with Intellectual Disabilities. • Educators and other direct care professionals in the field of intellectual disabilities.	
PR3 Training guidelines and pilots	• Educators and other direct care professionals in the field of intellectual disabilities. • Designers and coordinators of training actions and programmes.	English

Table 1. MOVE-IT Pedagogical materials. Source: own elaboration.

All these pedagogical materials are available at project website https://moveit.webs.upv.es/es/.

As mentioned before, one of the pedagogical materials of the MOVE-IT project are these training guidelines that have the objective to be used by professionals and educators working in the disability field when implementing the training activities. These training guidelines aim to provide recommendations for trainers to get the maximum benefit from the 2 exergames.

It is important to highlight that MOVE-IT, as an Erasmus+ project, focused on physical activity for PwID using exergames, considering the following horizontal principles and objectives of Erasmus+:

1. Inclusion and Accessibility: Erasmus+ emphasizes promoting inclusive education and training opportunities for all, regardless of background or ability. By utilizing exergames, which can be adapted to various skill levels and physical abilities, the project can enhance accessibility and inclusion for PwID in physical activity programs.
2. Lifelong Learning: The program encourages lifelong learning opportunities, including those related to health and well-being. Engaging individuals with intellectual disabilities in physical activity through exergames not only promotes immediate health benefits but also fosters ongoing learning about the importance of exercise and healthy lifestyle choices.
3. Innovation and Creativity: Erasmus+ supports innovative approaches to education, training, and youth work. Incorporating exergames into physical activity programs for PwID demonstrates a creative and innovative way to promote exercise and engagement in sports, leveraging technology to enhance accessibility and enjoyment.
4. Social Inclusion and Equity: The program promotes social inclusion and aims to reduce disparities in access to education, training, and sports opportunities. By providing a platform for PwID to participate in physical activity through exergames, the project contributes to social inclusion and promotes equity in access to sports and recreational activities.
5. Collaborative Partnerships: Erasmus+ encourages collaboration and partnership-building across sectors and countries. Projects linking physical activity for PwID using exergames can benefit from partnerships between educational institutions, sports organizations, health professionals, and technology developers, fostering cross-sector cooperation and expertise exchange.

6. Capacity Building: The program supports initiatives aimed at enhancing the capacity of individuals, organizations, and systems. Implementing projects focused on physical activity for PwID using exergames can help build the capacity of educators, coaches, caregivers, and health professionals to effectively support and promote inclusive sports programs.

Finally, aligned with these horizontal principles of Erasmus+, the MOVE-IT project has developed all the activities considering the Sustainable Development Goals, that are a call for action by all countries – poor, rich, and middle-income – to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and address a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection. Specifically, the Sustainable Development Goals (SDGs) that MOVE-IT has considered are the following:

SDG 3: Ensure healthy lives and promote well-being for all at all ages.

Exergames encourage physical activity, which contributes to improving overall health, well-being and combat sedentary lifestyles of PwID. Regular physical activity has benefits on cardiovascular health, muscle strength, coordination, and can help people with prevent non-communicable diseases and promote mental health

SDG4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

The exergames created are designed as educational tool to enhance digital learning experiences for PwID while engaging in physical activity. This aligns with the goal of ensuring inclusive and equitable quality education.

SDG5: Achieve gender equality and empower all women and girls.

Exergames can be accessible to people of all genders and ages, contributing to breaking stereotypes about physical activity and promoting inclusivity.

SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable.

Exergames can encourage outdoor physical activity, promoting the use of public spaces and contributing to creating more active and healthier communities.

SDG 13: Take urgent action to combat climate change and its impacts.

Certain exergames promote outdoor physical activity, encouraging individuals to exercise in nature. This aligns with the broader concept of sustainable practices and connecting people with the environment.

SDG 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development.

Collaborations between the gaming industry, health organizations, and educational institutions can foster partnerships that promote the development and use of exergames as tools for promoting health and sustainable development

1.2. Enhancing Physical Activity (PA) for People with Intellectual Disabilities (PwID) through ICT.

Integrating physical exercise and information and communication technology (ICT) in the education of PwID hold immense potential for improving their overall well-being. This section explores useful pedagogical approaches that combine physical activities with ICT tools to maximize engagement, learning outcomes, and inclusivity for individuals with ID.

Effective Pedagogical Approaches:

1. Adapted Physical Education (APE): Implement tailored APE programs for individuals with ID, utilizing ICT tools like video tutorials and virtual reality simulations for visual instruction and demonstration.
2. Gamification: Incorporate gamified elements into physical activities through customized games or APPs, enhancing motivation and engagement among individuals with ID.
3. Augmented Reality (AR) and Virtual Reality (VR): Introduce AR and VR technologies to create immersive experiences for physical activities, offering realistic simulations and virtual training environments.
4. Online Learning Platforms: Utilize online platforms offering adapted physical activity resources and instructional videos, enabling individuals with ID to access guided exercises independently or with assistance.
5. Wearable Technology: Integrate wearable devices for monitoring physical activity levels and providing feedback, visualizing data through ICT tools to track progress and set goals.
6. Social Networking and Communication APPs: Facilitate social interaction and collaboration among individuals with ID through online communities and communication APPs with accessibility features.
7. Personalized Learning: Tailor physical exercise programs and ICT-based activities to accommodate diverse needs and preferences, ensuring inclusivity and accessibility for individuals with ID.
8. Collaborative Projects: Encourage collaborative projects integrating physical activities with ICT skills development, promoting teamwork and creativity among individuals with ID.

Benefits of Physical Exercise for Individuals with ID:

1. Physical Health Benefits: Improved cardiovascular fitness, muscular strength, and overall wellness contribute to better health outcomes.
2. Mental Health and Emotional Well-being: Reduced stress, anxiety, and depression, leading to increased self-esteem and emotional well-being.
3. Social Interaction and Inclusion: Opportunities for social interaction, peer support, and the development of social skills in a supportive environment.
4. Cognitive Development: Enhanced cognitive function, attention, memory, and academic performance through regular physical activity.
5. Behaviour Management: Improved behaviour management and self-regulation, leading to better overall functioning.

6. Lifespan and Quality of Life: Long-term benefits for lifespan and quality of life, promoting independence and well-being as individuals age.
7. Functional Skills Development: Enhanced functional skills necessary for daily living, leading to increased independence and community participation.

In conclusion, promoting physical exercise through ICT-based pedagogical approaches offers a promising avenue for enhancing the health, well-being, and overall quality of life of individuals with intellectual disabilities. By leveraging the benefits of physical activity and ICT tools, educators can create inclusive learning environments that empower individuals with ID to develop their physical, cognitive, and social skills effectively.

1.3. Exergames and mobile assistive technology (APPs)

1.3.1. Exergames and APPs

Exergaming, also known as active video games (AVG), is defined as a video game that requires body movements to control the game (Benzing & Schmidt, 2018). Exergames promote increased physical activity by utilizing the entertaining aspects of games as a motivator, and some research has been explicitly aimed toward providing such a platform for PwID.

Exergames are a subcategory of serious games which focuses mainly on physical activity interventions. Exergames also aims to integrate gamification aspects to provide an entertaining and motivating platform for increasing physical activity levels. Conducted research shows potential for exergames to increase physical activity levels.

Exergames are designed to be engaging and entertaining, combining exercise with the enjoyment of playing a video game. This entertainment factor can motivate individuals to stay active for longer periods. Many exergames provide real-time feedback on performance, such as calories burned, heart rate, or points earned. This feedback can help users track their progress and stay motivated. Some exergames offer multiplayer modes or online connectivity, allowing players to compete or collaborate with others, fostering social interaction and a sense of community.

1.3.2. Mobile Assistive Technology (APPs)

An increase in the use of mobile assistive technology for PwID has been celebrated as the most substantial benefactor to the rehabilitation of PwID. The Assistive technology aims to remove some boundaries that might be considered a hindrance to people with impairments.
Several studies indicate that implementing assistive technology for PwID has a positive effect and can alleviate difficulties such as impaired memory or attention deficit disorder. The use of a mobile assistive technology has proven to have the following advantages for Pwith ID:

- Lasting benefits: Some cases show good results in memory exercise, even when the devices were taken away.
- The portability and size of mobile and tablet devices are the appropriate size for everyday use.
- In everyday use, PwID prefer the use of electronic devices. They are considered more effective than traditional methods, and the user finds them more entertaining and comfortable.
- The use of electronic devices gives the user more independence and make them feel included and involved in current trends.

Aligned with these advantages, MOVE-IT project has developed the two following exergames to be used by the main target of the project that is people with mild or moderate intellectual disability:

- AGA (Activity Game Avatar)

What is AGA?
Activity Game Avatar is a mobile application which helps to improve the physical activity among the intellectually disabled people. In the APP there are several exercises with a background music which motivates and makes it interesting to do the exercises.

Where can AGA be used?
Using the AGA, the exercises can be done either indoor or outdoor as the user pleases. What matter is only a mobile device either a mobile phone or a tablet.

The aim of AGA:

- A motivational exercise application for mobile devices that is specifically designed for PwID. Since it is developed for phones and tablets, it makes for easy integration into everyday life.
- A modern approach to physical activity in the form of an avatar-based game, combining exercise with motivational mechanics often found in game environments.
- Multiple users allow for a competitive environment containing motivational features such as points and unlockable rewards.

The link to be download is: https://play.google.com/store/apps/details?id=no.uit.ifi.aga

- SORTERIUS

What is Sorterius?
Sorterius is an exergame developed targeting increased Physical Activity (PA) levels for persons with mild to moderate ID. It is an augmented reality game promoting increased PA levels in PwID. It is intended to move around to find the trash which are set up through augmented reality. Augmented reality (AR) is the integration of digital information with the user's environment in real time.

Where Sorterius can be used?
The APP works both indoor and outdoor.

Aims of Sorterius:

- To promote the physical activity in people with intellectual disability.
- To maintain the users' interest in the game over an extended period.

Why is it used?

- Users are introduced to the functionality of the system from the start.
- Users can personalize their experience.
- Users might become motivated from the start to play the game to collect more items(trashes) for the mascot.

How does it work?

- The game scenario consists of aiding a mascot in collecting and sorting located trash objects.

- The application is designed to accommodate varying levels of intellectual disability by providing three difficulty levels.
- The user interface is designed to be utilized by PwID, consisting of large buttons, easy-to-read text, and providing instructions automatically without user interference.
- The application utilizes a star-point system and weekly rewards to motivate its users to play regularly.
- The game does offer some motivational aspects.

The link to be download is: https://play.google.com/apps/testing/no.uit.ifi.SorteriusLuzi.Moveit

1.4. Ethical considerations of training through Information Technologies (ITs).

When training through ITs involves PwID, additional ethical considerations come into play to ensure their safety, dignity, and inclusion. Here are some of the key ethical considerations:

Informed Consent and Capacity: PwID may have varying levels of understanding about participating in IT training. Ensuring informed consent involves considering their ability to comprehend and decide autonomously. Safeguards should be in place for those unable to provide consent.
Accessibility and Universal Design: IT training programs must be accessible for PwID, accommodating diverse learning needs and communication styles through alternative formats and adaptive technologies.
Privacy and Dignity: PwID deserve privacy and dignity in IT training, requiring robust privacy protections and measures against discrimination or stigma.
Empowerment and Autonomy: IT training should empower PwID by facilitating skill development, self-expression, and social inclusion, fostering autonomy, and enabling independent decision-making.
Guardianship and Supported Decision-Making: For those PwID needing support to make decisions, ethical considerations include promoting supported decision-making that respect their rights and interests while involving trusted supporters.
Equity and Access: Ethical IT training should promote equity and access to opportunities, addressing barriers like digital literacy gaps and socioeconomic disparities.
Quality of Life and Well-Being: IT training should contribute to the overall quality of life and well-being of PwID.
Ethical Oversight and Accountability: Organizations must maintain ethical oversight and accountability throughout IT training, addressing concerns promptly and upholding standards in research and data management.

By addressing these ethical considerations, IT training programs can better support the inclusion, empowerment, and well-being of PwID, promoting their participation in the digital society and enhancing their opportunities for personal and professional growth.

2. Move-IT Pilot test.

2.1. Introduction: Definition and justification of pilot test.

Pilot test has different meanings depending on the field or the needs of the study. Even so, it could be explained as “a small or short study of feasibility and viability, conducted to test the methodological aspects of larger scale or complexity” (Muñoz, 2020). Piloting new interventions ensures that the methodological approach is robust and feasible (Lancaster, 2015). Furthermore, in educational projects, a pilot test is relevant because “the teaching of the research covers all aspects of the research process, involving pilot studies” (Muñoz, 2020).

In order to validate the training course methodology, and develop a transferable educational model, MOVE-IT Project has planned a pilot which aims to evaluate the use of gamified applications to improve physical activity performance in individuals with mild to moderate level of intellectual disability.

2.2. Description of the MOVE-IT pilot test.

MOVE-IT project has produced 3 educational resources (PR1 and 2 exergames) and piloting 3 training activities (phases), involving professionals and PwID, in order to collect the needed information to create the final educational MOVE-IT model (PR3) which is described in following sections.

The pilot test has been implemented by two partners: Cercioeiras (Porgtugal); and IVASS (Spain). The study has involved the participation of 8 professionals and 26 individuals with mild to moderate intellectual disabilities over a period of 5 weeks. The impact results were obtained through the passes of evaluation questionnaires and the correspondent data collection and analysis. The information collected and analyzed was used to measure not only the project impact, but also to develop the final MOVE-IT educational model (PR3).

It should also be highlighted that the Project MOVE-IT has developed a document called "Study protocol" (annex 8) to collect all kind of instructions, procedures, requirements, study instruments and any procedure that are needed to fulfil the Pilot tests of the APP´s Sorterius and AGA. Regarding the eligibility criteria of the participants, the protocol also includes both the selection and exclusion criteria. Thus, it has been included those individuals with low physical activity levels, basic smartphone knowledge and consent willingness. On the other hand, exclusion criteria prevent participation for those who may not be aware of their surrounding when using the APP, posing a safety risk, and those with visual impairments that could affect their ability to interact visually with the smartphone or APP. As it was mentioned above, this document is available in annex 8, having its own bibliography.

Finally, the phases forming the pilot test and explained in the following section are the following:

- Phase 0: Training for professionals.
- Phase 1: PwID using exergames supervised by a professional.
- Phase 2: Free use of exergames by PwID.

2.3. Phases of the pilot test.

2.3.1. Introduction.

As it was mentioned above the pilot test consists of 3 phases. In the first stage (phase 0), 8 professionals received a training course of 15 hours. In the second stage (phase 1), the same professionals supervised the use of the exergames by 26 PwID through programmed physical activity sessions. In the third stage (phase 2), PwID used the APPs voluntarily without programmed sessions. Data was collected at three time points: baseline (before starting phase 1), after finishing phase 1 (week 3), and after finishing phase 2 (week 5).

2.3.2. Phase 0. Training for professionals.

This phase consists of a 15-hour course mostly based on the contents of PR1. This phase had a duration of 1 week. In addition, the participating professionals acquired the knowledge needed to carry out the other two phases of the pilot test (table 2).

To acquire knowledge about PR1:	Steps to be followed (Pilot test):
▪ Use the APPs as assistive technologies. ▪ Online security, privacy, and ethical considerations. ▪ How to encourage participants. ▪ How to avoid possible injuries when practicing light sports activity.	▪ Read the Study protocol. ▪ Read "Study Documentation" ▪ Read the user manual of APPs. ▪ Download the APPs on a device (smartphone or tablet) ▪ Test the APPs. ▪ Recruit PwID to use APPs. ▪ Pass the questionnaire of learning outcomes (Quest_03).

Table 2. MOVE-IT Pilot Phase 0. Source: own elaboration.

2.3.3. Phase 1. PwID practice Phiscal Activity (PA) using the APP´s supervised by a professional.

In this phase, PwDI and professionals were both involved in the use of the exergames, carrying out the following activities:

Professionals	Participants
▪ Introduce the project, the PwID rights and what is their participation. ▪ Explain how to use the APPs. ▪ Help PwID to fill out the questionnaires and with the use of the APPs. ▪ Make clear the correct way to do the training. ▪ Take a register of the sessions.	▪ Know about the project, their participation on the pilots and their rights. ▪ Fill out two questionnaires about digital literacy and the IPAQ short form about physical activity (Quest_01 and Quest_02) before starting the phase and after finishing this phase.

Table 3. MOVE-IT Pilot Phase 1. Source: own elaboration.

This phase had a duration of 2 weeks, with 3 programmed sessions per week of 20 minutes each. The first session was longer than the rest of them, due to the requisite of introducing the two APPs and its instructions.

- The **first session** had a duration of 45 minutes, and its structure was:

  - 5 minutes introducing benefits of the exercise and deciding the participant's goal.
  - 10 minutes presenting the APPs, their features, instructions, giving a demo of how to use them, and providing extra motivation.
  - 5 minutes of warming before the physical activity.
  - 20 minutes of independent activity by the user.
  - 5 minutes to low the level of activity, to stretch and talk about the session.

- The **rest of the sessions** had an estimated duration of 30 minutes using the two APPs, following this structure:

  - 5 minutes of warming before the physical activity.
  - 20 minutes of independent activity by the user.
  - 5 minutes to low the level of activity, to stretch and talk about the session.

2.3.4. Phase 2. PwID use the APPs on voluntary basis.

For two more weeks, PwID use both APPs on voluntary basis. The role of the professionals and the tasks of PwID in this phase are:

Professional	Participants
▪ Help PwID to fill out the questionnaires and with the use of the APPs.	▪ After the two weeks of this phase, fill out the two questionnaires about digital literacy and the IPAQ short form (Quest_01 and Quest_02).

Table 4. MOVE-IT Pilot Phase 2. Source: own elaboration.

3. MOVE-IT educational model: Training guidelines and evaluation methodology.

3.1. Introduction: MOVE-IT model.

The MOVE-IT educational model is formed by two elements: 1) 3 phases needed to be implemented to fully achieve the project learning results (each phase consists mostly of a training activity: figure 2); and 2) an evaluation methodology. Its objective is to guide educators to maximize the pedagogical benefits of using the 3 most important tangible educational products of the MOVE-IT project[1]:

a. PR1 (physical activity, intellectual disability and technology);
b. Exergame APP Sorterius;
c. Exergame APP AGA.

Each phase is divided into 3 sections: a) general features; b) target group; and c) training content.

Therefore, the final goal of this educational model (Figure 1) is to maximize the potential of the MOVE-IT educational resources and increase the level of Physical activity of PwID, progressively, from low levels of physical exercise to carrying out such a physical activity on a regular basis for their own well-being.

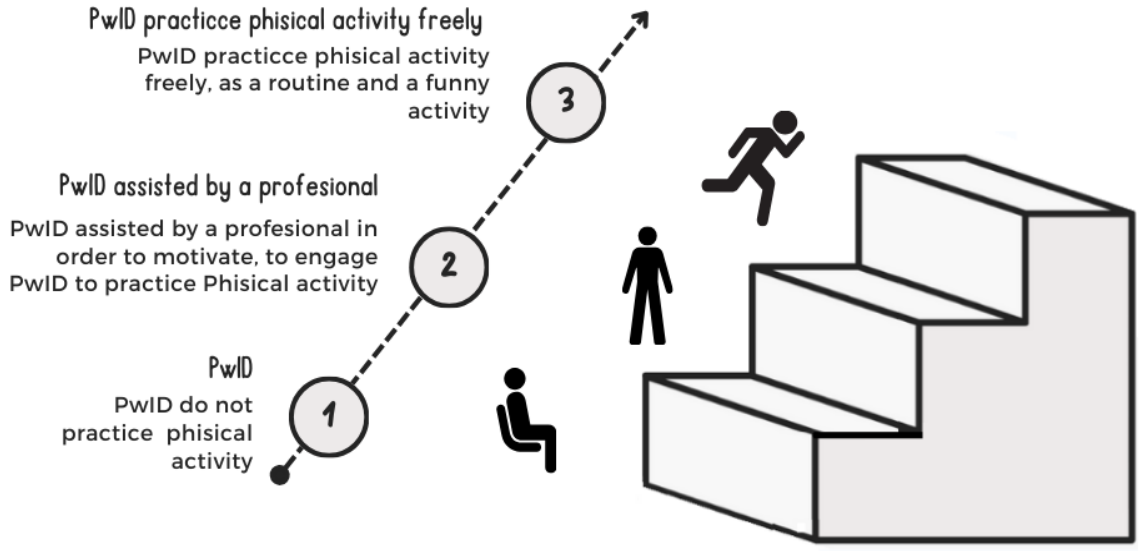

Figure 1. MOVE-IT Objective. Source: own elaboration.

[1] These 3 products can be downloaded free of charge from the project website: https://moveit.webs.upv.es/

3.2. Phases of the MOVE-IT model.

Within the framework of the MOVE-IT project, after obtaining the results from the pilot test, the MOVE-IT educational model was developed, with some adjustments in terms of the duration of the phases to do the learning process more effective. This educational model might be defined as a non-formal blended learning composed by 3 phases and two types of training will be carried out, one aimed at professionals and the other for PWDI, as shows the figure 2.

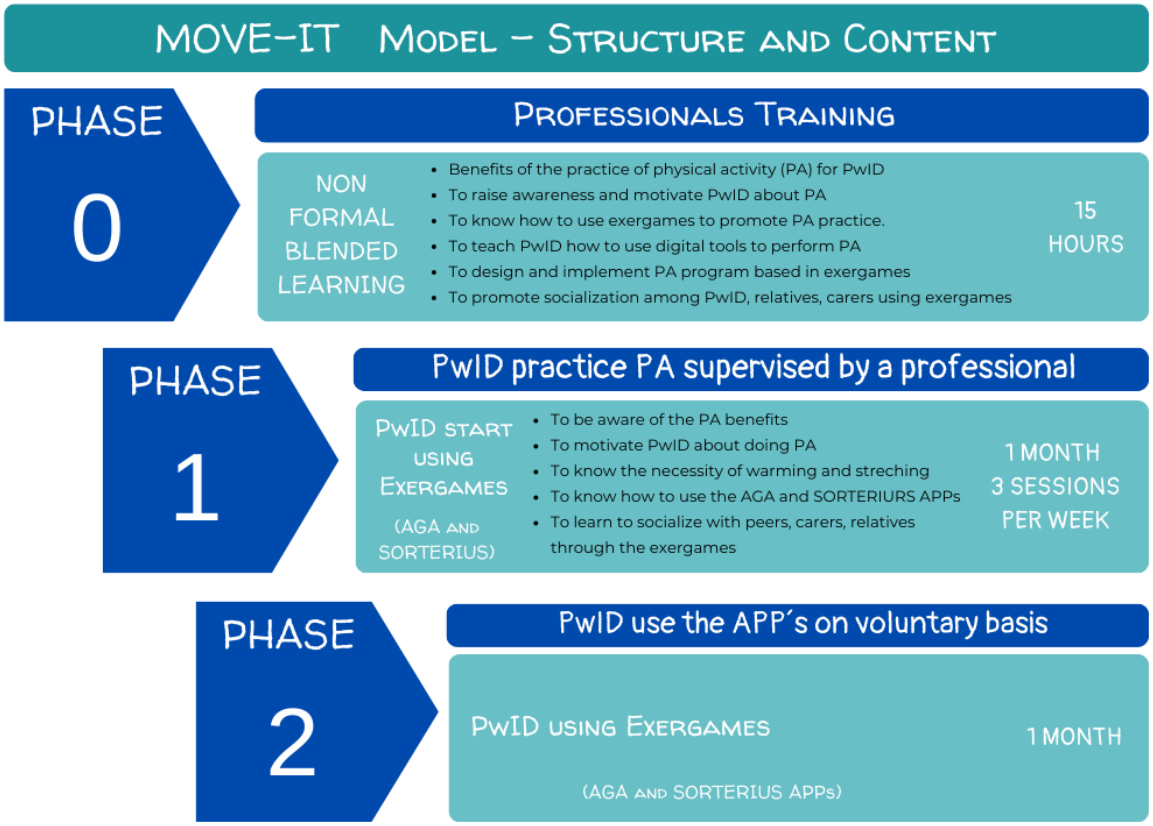

Figure 2. MOVE-IT Model Structure. Source: own elaboration.

3.2.1. PHASE 0: Training course for educators and professionals.

General features of the training course within Phase 0.

The phase 0 of MOVE-IT model proposes a 15-hour non-formal training course tailored for educators and professionals working with PwID, for being implemented in a traditional classroom, but it would also be possible a blended learning methodology where the process is carried out using both on-site and online modalities.

This training activity is based on the contents developed in the MOVE-IT PR1 product and breakdown into 4 units (The importance of the physical activity; the motor activity in PwID; physical activity: what do we mean?; and the role of ICT for promoting physical activity). The product takes the format of a handbook, containing complementary pedagogical resources such as videos and presentations.

The main goal of this phase is to improve the professional´s knowledge and competences related to the implementation and maintenance of physical activity routines with the support of the ICT´s to manage the needs of PwID during the next phases. Professionals, in this way, will become teachers and coaches in the next phases.

However, it should be noted that the duration of training course implementation is flexible, and it might be adjusted to specific context and reality in terms of size, characteristics and needs of the group of participants.

Training target group

The target group involved in this phase are professional working with PwID and their relatives. The next table 5 includes profiles of professionals who can deliver the training activity among others.

Occupation	Description of occupations according to the ESCO (European Commission, n. k.)	Description of occupations adapted to the field of functional diversity; various sources
Occupational therapist	Occupational therapists help individuals or groups who have occupational limitations due to illness, physical disorders and temporary or permanent mental disabilities, to regain their ability to perform daily activities. They provide treatment and rehabilitation so that they can actively participate in society, live their lives as they wish, and engage in activities that are meaningful to them.	Designing and developing individual and group programmes. Implementing specific treatments for functional recovery to improve quality of life in daily living activities. Performing, supervising and evaluating programme implementations under technical supervision and together with the multi-professional team. Collaborating in matters within his/her competence in information programmes.
Psychologists	Psychologists study human behaviour and mental processes. They provide services to clients with mental health and life problems such as bereavement, relationship difficulties, domestic violence, and sexual abuse. They also provide counselling for mental health problems such as eating disorders, post-traumatic stress disorders and psychosis in order to help clients rehabilitate and achieve healthy behaviour.	Organizing and planning the psychological area, leading the coordination with the rest of the service areas. Carrying out tests, diagnosing, assessing and carrying out individual and group programmes. Drawing up psycho-pedagogical reports. Developing programmes together with the multiprofessional team, developing specific guidance and carrying out technical supervision. Monitoring and evaluating the programmes being carried out. Collaborating in matters within his/her competence in information programmes.

Vocational education teachers	Vocational education teachers instruct students in their field of specialization, which is predominantly practical in nature. They provide theoretical instruction in favour of the practical competences and techniques that students will later master in the vocational training of their choice and assist in the development of attitudes and values on this basis. Vocational teachers monitor students' progress, assist individually when necessary and assess their knowledge and performance in the subject through assignments, tests and examinations.	Developing the overall workshop programme and associated report. Carrying out the theoretical and practical programme. Evaluating each programme and reporting on the results. Coordinating the educational and work actions together with the multi-professional team. Maintaining the workshop machinery and tools properly. Taking an inventory and reporting on needs.
Physical education vocational teacher	Physical education vocational teachers instruct students in their specialised field of study, physical education, which is predominantly practical in nature. They provide theoretical instruction in service of the practical skills and techniques the students must subsequently master for a physical education-related profession, such as health specialist or outdoor activities organiser. They induce students in the convenient social frameworks of their field of study and teach the appropriate attitudes and values. Physical education vocational teachers monitor the students' progress, assist individually when necessary, and evaluate their knowledge and performance on the subject of physical education through assignments, tests and examinations.	Modifying and adapting physical activities to ensure inclusivity and accessibility for students with diverse abilities. Tailoring instructional strategies and accommodations to meet individual student needs. Designing and implementing inclusive lesson plans that accommodate students with different levels of ability. Collaborating with special education professionals, therapists, and other stakeholders to develop Individualized Education Plans. Creating a supportive and encouraging environment where students feel valued and empowered to participate to the best of their abilities.
Psychomotor therapist	A Psychomotor Therapist is a healthcare professional specializing in the treatment and rehabilitation of individuals with physical, psychological, or developmental disorders through the use of movement and physical activities. They work with clients across different age groups, from children to elderly individuals, to improve motor skills, cognitive functions, emotional well-being, and social interactions.	Evaluating clients' motor skills, emotional states, and overall functioning. Developing individualized treatment plans based on assessment findings and client goals. interventions. Implementing therapeutic interventions and activities to address clients' needs and goals. Monitoring clients' progress and adjust treatment plans as needed. Providing education and guidance to clients and their families on techniques for managing symptoms, promoting independence, and enhancing overall well-being.

Table 5. Profiles of professionals who can deliver the training activity.
Source: IVASS' own information and https://esco.ec.europa.eu/en/classification/occupation_main

MOVE-IT- 15H Training content and learning outcomes for professionals.

The 15-hour course content is based on the information contained in the 4 units of PR1. In addition, as it can be seen in figure 3, it has been added the sessions duration and the learning outcomes expected to be achieved during the course are included.

To evaluate the learning results of this course, the project has developed the tools 1 and 2 (included in following sections).

Figure 3. MOVE-IT Road map. Source: own elaboration.

3.2.2. PHASE 1: PwID do Physical Activity supported by a professional.

General features of the training course

During this phase the professionals having taking part in phase 0 supervise, motivate, help and teach PwID to use the 2 APPs: Sorterius and AGA. The objective is, by using the APPs, to practice Physical Activity (PA) as a way to improve not only their own wellbeing but also their ability with new technologies, socializing with peers, carers, relatives… between others.

According to the information obtained after pilot test, the recommended duration of this phase is the use of the chosen APP for 4 weeks; 3 training sessions per week in order to PwID get used doing PA and thus to maximize the potential of the APPs and achieve the learning outcomes established for this training course.

To accomplish this objective, the professional should prepare a training session tailored to each PwID. The duration of each session is defined by the professional together with the PwID and according to the different possibilities of the APPs settings (length, difficulty…), scheduling a program with 3 training-sessions for 1 month. The professional, also supervises while motivates, helps and supports the learner.

Following this approach, the estimated number of sessions of the training activity would be as it shows in table 3.

Number of sessions	Sessions duration	Total duration
12 sessions 3 sessions per week	1st session: 45´ Rest of sessions: 30´	6h 15´

Table 3. Information MOVE-IT training course for PwID

The advisable duration of this training activity is only an estimation, as the achievement of the learning outcomes may vary from other factors external to the activity itself, for example, the socio-cultural context surrounding PwID, the resources/capacities available to the educational institution, the characteristics, needs and learners´ profile. The training course proposed must be adjusted to specific context and reality in terms of characteristics and needs of the participants. The main goal of the professional within this phase is to engage PwID to do PA. To do that is paramount the personal relationships to be built between the educator, PwID and their families; or the specific educational support needs of each of the participants.

Summing up, but for the first session, the rest of the sessions cover many common aspects (motivation, support, warming before starting the physical exercise…); and the invested time will be slightly different between the first session and the others. Next figure 4 shows an example:

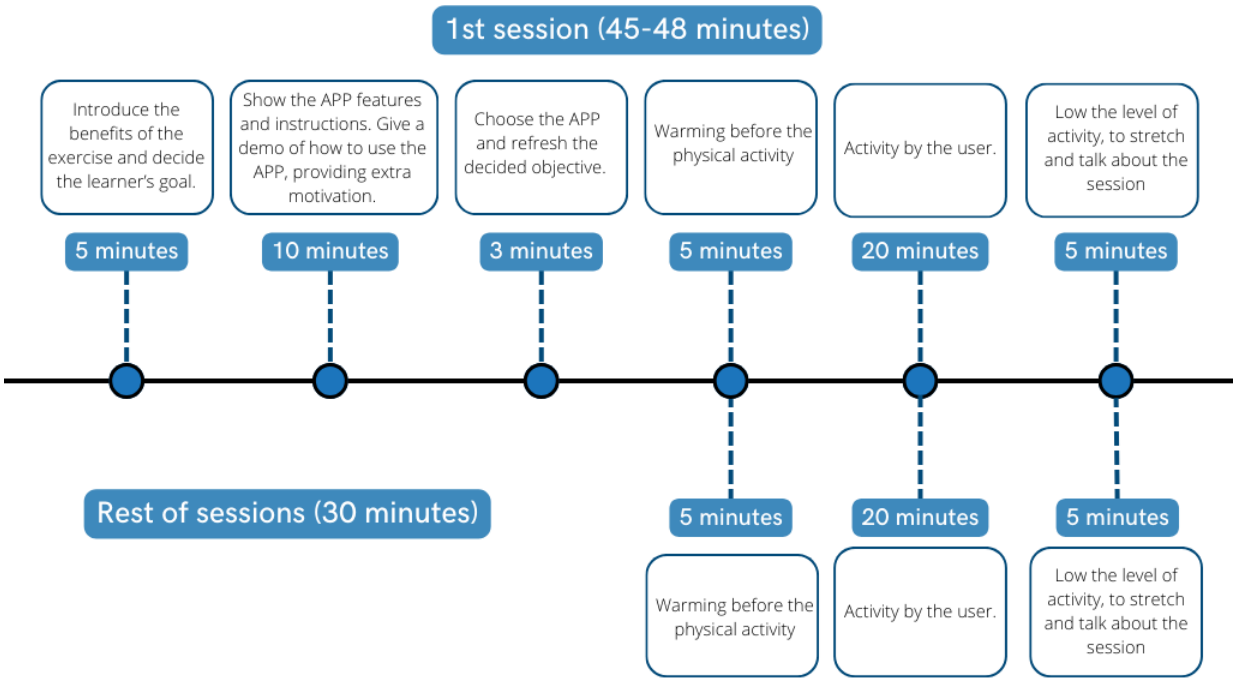

Figure 4. MOVE-IT example sessions. Source: own elaboration

Regarding the resources needed, they are as it can be seen in Table 4:

	AGA	Sorterius
HUMAN RESOURCES	1 person supporting a small group of PwID.	1 professional (or carer, relative...) supporting PwID.
ENVIRONMENT	A room or space to practice physical exercise	A safe environment, without stairs, obstacles, etc., where is able to walk without any danger.
MATERIAL RESOURCES	Devices to download APPS´s: tablet, mobile phone	

Table 6. Information MOVE-IT training course resources needed.

Training target group

The course has been designed for a PwID profile that can/are able to understand what an exergame is and have sufficient interest and motivation to follow the contents, using de APPs (Sorterius and AGA) and subsequently want to take part in the MOVE-IT training course. This would generally correspond to PwID with a mild level of intellectual disability (ID) and with autonomy to carry out basic activities of daily living. According to the Quality of Life model, they would have a need for limited or intermittent support in the competences necessary to use the exergames. In terms of language and reading competences, they would be those corresponding to the second level of primary school (although reading and writing would not be an essential requirement), with a good level of comprehension and expressive language. Their limitations are more evident in cognitive competences requiring abstract thinking.

It is also important that PwID have figure-ground discrimination, absence of tremors that alter fine motor skills and do not allow precise, coordinated, and controlled movements of hands and fingers. Also, it would be necessary they have orientation ability. All this can obviously be supplemented with technical aids and adaptations according to the user's needs.

Regarding the APPs, PwID require a minimum of understanding to be able to play but it is simple as it is quite intuitive.

Together, the users and professionals in the object group form a dynamic ecosystem wherein user-centric design principles, coupled with professional expertise, actively involving both PwID and professionals, being a team that can ensure that the APPs not only meet functional requirements but also delights users and delivers tangible value. This collaborative approach fosters empathy, creativity, and a deeper understanding of user needs, ultimately leading to more successful outcomes and user-centric solutions.

MOVE-IT - Training contents and learning outcomes for PwID.

The training contents are those linked to getting familiar and learn how to use the different benefits of the APPs. The Learning outcomes showed below (table 7) provide a clear roadmap for what learners will achieve by the end of the phase 1.

• Learner knows about their own rights • Learner knows the benefits of regular physical activity practice. • Learner understands the necessity of warming and stretching. • Learner knows how to use technological applications to practice physical activity. • Learner knows how to socialize with peers, caregivers, and family members through the use of exergames and the practice of physical activity.

Table 7. Information MOVE-IT training course resources needed.

3.2.3. PHASE 2: PwID use the APPs on voluntary basis.

General features of the Phase 2

After the learning process of phase 1, where PwID get use to the use of APPs to carry out physical activity, the goal to be fulfilled in this phase is the use of the APPs by PwID in a freely way, to practice physical activity as a routine.

In addition, it is expected from the professional to carry out several tasks:

- PwID will need an explanation about the possibility of using the APPs on a voluntary basis without programing the physical activity. PwID can download the APPs on their own devices or using the educational institution ones.
- They must observe whether PwID use APPs or not.
- Although in this phase proactivity is expected from users, some of them could need to plan the use of the APP[2].

These tasks can be extended outside the educational institution, relatives, carers, family and so on.

Training target group

Both target groups (professionals and PwID) take part in this learning process. Although PwID is the primary focus of the learning process of this phase, the professional's role is also important to facilitate the adoption of APP-based physical activity as a routine part of PwID lives.

MOVE-IT - Training contents and learning outcomes for PwID.

Related of the contents and learning outcomes of this phase, they can be considered as a reinforcement of those belonging to the previous phase.

[2] After pilots, it has been observed that some users with a lower level of autonomy need a weekly or monthly plan to do any kind of activity. In these cases, it should be necessary to prepare a plan of using the APPs in some users.

3.3. Evaluation methodology and tools.

3.3.1. Evaluation methodology

This section is devoted to present the final evaluation methodology and tools developed by MOVE-IT project. The proposed evaluation methodology consists of a mixed method evaluation to assess the 3-traning processes through 7 different evaluation activities and tools. The key elements of each tool (objective, type, and target group) can be seen in the table 5.

The method can be summarized as a combination of quantitative and qualitative methods used to create the tools and implement the evaluation activities. The specific way chosen to combine the quantitative and qualitative research might be defined as “Completeness” by which through this mixed method “the researcher can arrive at a more comprehensive account of the area of inquiry” (Bryman, 2016).

On the one hand, the MOVE-ITCA evaluation methodology and tools created in the framework of the MOVE-IT project aims at assessing: a) competences acquired by professionals and PwID; b) satisfaction of professionals and PwID; and the kind of physical activity done by PwID. On the other hand, an additional ongoing evaluation might be considered by educators, which would consist of observing and assessing the evolution of each person and group. This evaluation will allow the necessary changes to be made in terms of time, frequency, level of support.

Tool		Objective	Type	Target group	N. Passes
1	Acquired knowledge test	To assess the competences of participants taking part in the training course phase 0	Test	Professional	1 pass After the phase 0 training activity
2	Training activity satisfaction questionnaire	Professional opinion of the training course to improve the training course	Questionnaire Likert Scale	Professional	1 pass After the training activity
3	IPAQ short form	To assess about the kinds of physical activities that the participants do as part of their everyday lives	Questionnaire	PwID	3 passes Phase 1: pre - post After phase 2
4	Digital literacy questionnaire	To assess the digital literacy on the use of mobile APPs for PwID	Questionnaire	PwID	3 passes Phase 1: pre - post After phase 2
5	Training activity satisfaction questionnaire	PwID opinion of the AGA and Sorterius APPs to improve them	Questionnaire Likert Scale.	PwID	1 pass After phase 2
6	Training activity global satisfaction questionnaire	Professional opinion of the MOVE-IT non-formal training model	Questionnaire Likert Scale	Professional	1 pass After phase 2
7	Global satisfaction with the APPs AGA and Sorterius questionnaire	Professional opinion of the general features of the APPs	Questionnaire Likert Scale	Professional	1 pass After phase 2

Table 8. MOVE-ITCA TOOL KIT – Evaluation tools. Source: own elaboration.

In addition, this section includes a brief description of each tool and their scheduling as well, figure 4 in the following page.

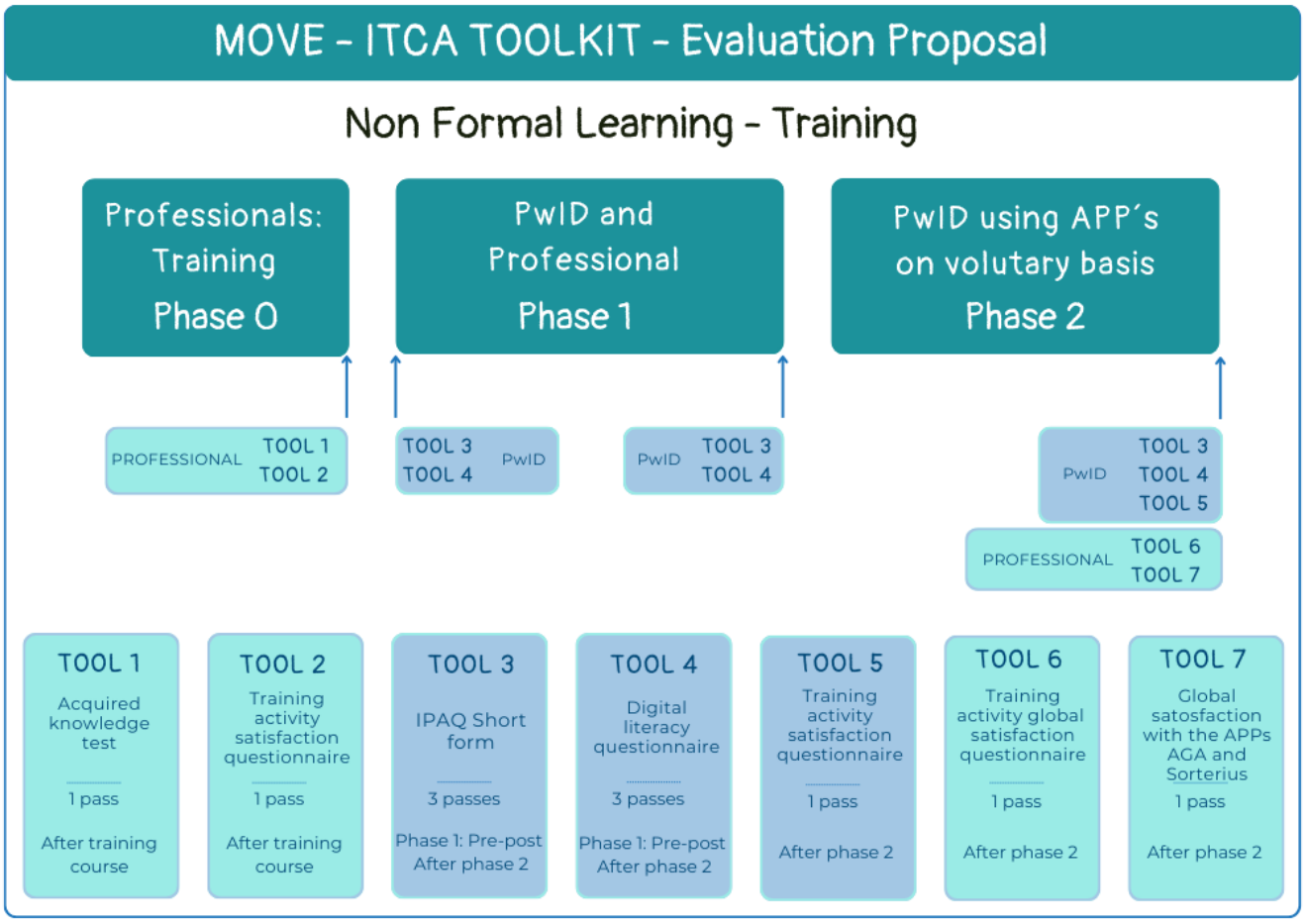

Figure 4. MOVE-ITCA EVALUATION TOOL KIT – Schedule of Evaluation tools. Source: own elaboration

3.3.2. Evaluation tools.

The MOVE-ITCA evaluation toolkit is made up of 7 tools, detailed below and included as annexes to this document (annexes from 1 to 7). The evaluation tools are generally presented with instructions followed by the quantitative or/and qualitative questions.

TOOL 1: Acquired knowledge test.

This is a self-administered questionnaire to be completed by the professionals participating in the phase 0 of the training activity. Its objective is to evaluate the competences related to the MOVE-IT training phase 0. This questionnaire should be completed after finishing the phase 0.

TOOL 2: Training activity satisfaction questionnaire.

This is another paper-questionnaire, created in order to know the satisfaction of the professionals participating in the training activity and collect their feedback for possible improvements in the future. This questionnaire should be completed after finishing the course (phase 0).

TOOL 3: IPAQ short form.

The objective of this tool is to find out about the kinds of physical activities that PwID do as part of their everyday lives. This questionnaire should be filled out 3 times: Before starting phase 1, after phase 1, and finally after finishing the phase 2.

TOOL 4: Digital literacy questionnaire.

The objective of this questionnaire is to evaluate the digital literacy on the use of mobile APPs for PwID This questionnaire should be completed 3 times: pre and post the phase 1 and after finishing the phase 2.

TOOL 5: Training activity satisfaction questionnaire.

The main objective of this questionnaire is to evaluate the satisfaction of the PwID participants who use AGA and Sorterius APPs and collect their feedback to improve them.

TOOL 6: Training activity global satisfaction questionnaire.

The objective of this questionnaire is to collect information about the professional opinion after having finished the 3 phases of the MOVE-IT training activity.

TOOL 7: Global satisfaction with the APPs AGA and Sorterius questionnaires.

This tool aims to collect the overall opinion of professionals about the features of the APPs after having used them throughout the training program.

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5. Annexes.

5.1. Annex 1. Tool 1. Acquired knowledge test.

TOOL 1	ACQUIRED KNOWLEDGE TEST	
Instructions:	The main objective of this questionnaire is to evaluate your competences related to the MOVE-IT course. Please complete the requested information.	
Date:	Phase:	ID Participant:

QUESTIONNAIRE

1. How do the theoretical systems below define intellectual disability? Connect each one with the corresponding definition.

ICD-10	A condition of arrested or incomplete mental development, characterized especially by the deterioration of skills manifested during the period of development, skills that contribute to the general level of intelligence, that is, cognitive, linguistic, motor and social skills.
DSM-5	The notion of IQ has been adopted as a significant statistical factor for an adequate diagnosis at the level of cognitive functioning.
ICF	In the recent version, the notion of mental retardation has been changed to the notion of 'Intellectual Development Disorder'.
WHO	Defines intellectual disability according to the interaction between the notion of activity limitation and deficiencies.

2. How do the following models or theories define “Motivation?” Connect each one with the corresponding definition.

Behavioral Theory of Behavior	The concept of self-efficacy plays a central role. People would have specific beliefs about themselves and their abilities to do something: these ideas would represent the background of each action and regulate motivation levels.
Bandura's motivation model	Motivation can be classified as not present, present thanks to intrinsic motivation (interesting, achievable in itself), present thanks to extrinsic and external motivation factors (e.g., specific rewards, positive feedback).
Self-Determination Theory	The concept of self-efficacy plays a central role. People would have specific beliefs about themselves and their abilities to do something: these ideas would represent the background of each action and regulate motivation levels.

5. Match the definition with the correct level of ID:

They are slower in all areas of conceptual development, social and daily living skills; they are able to blend in socially. These individuals can learn practical life skills, which allows them to live independently with minimal levels of support.	MODERATE ID
They have noticeable developmental delays and may have physical signs of impairment. They can travel to familiar places in their community and learn basic skills related to safety and health. Their self-care requires moderate support.	PROFOUND ID
Individuals often have the ability to understand speech but they can only communicate on the most basic levels. They are able to engage in simple self-care, but they cannot successfully live an independent life	SEVERE ID
They have significant delays in all areas, they cannot live independently and they require close supervision and help with self-care activities. They have very limited ability to communicate and often have physical limitations.	MILD ID

6. Choose between "aerobic" or "anaerobic".

	Aerobic	Anaerobic
Swimming		
Running		
Weightlifting		
Jump rope		
Yoga		

7. Choose if it´s True (T) or False (F).

	T	F
Regardless of the physical activity performed, it is not possible to prevent DOMS		
Stop if the pain manifest acutely		
Specific remedies for DOMS are possible		
One week is enough to increase the level of intensity when introducing new exercise		
It is important to keep progressions slow alternating it with rest		
During physical activity the pain should be felt due to muscles hard work		

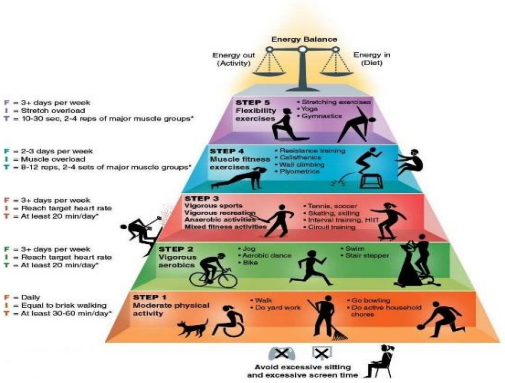
8. The intellectual disability severity can be classified in (choose the correct answer):

- ☐ Lower degree, Upper degree and First degree
- ☐ Mild, Moderate, Severe and Profound
- ☐ *Low* level (25%), *Medium* level (50%), *Hard* level (75%), *Very Hard* level (100%)
- ☐ *First* stage, *Second* stage and *Advanced* stage

9. The metabolic intensity refers to the type of energy based used in exercise and intensity. Which concept refers to aerobic and anaerobic exercise?

Aerobic	• doesn't require oxygen to produce energy • low to moderate intensity and sustained physical activity • Examples: jogging, cycling, swimming, or dancing
Anaerobic	• requires oxygen to produce energy • Examples: weightlifting, sprinting, or jumping. • high intensity and short duration

10. Based on the exercise pyramid, please sugest a weekly (days) training routine, with 60 minutes per day, with at leas 3 different activities per each day, including: warm up/mobility/ flexibility, fundamental phase (cardio, strengh and other exercises), cool down.



11. How would you monitor the intensity of the training with a non verbal PwID? Please describe 3 strategies.

12. Choose if it´s True (T) or False (F).

	Establishing a routine is an effective strategy to help individuals with intellectual disabilities develop the habit of physical activity, making it easier to sustain over time.
	Breaking down the activity into manageable steps can help individuals with intellectual disabilities (ID) build confidence and feel a sense of accomplishment.
	Using positive reinforcement, such as praise and small rewards, is not a recommended strategy for motivating individuals with ID to engage in physical activities.
	Setting concrete goals can provide the right motivation to complete a physical activity.
	Planning the next activity with the individual can make them feel more comfortable and engaged.
	Involving family and friends in physical activity is not a helpful strategy for creating a supportive and fun environment.
	Pairing the individual with a peer mentor who is also involved in physical activities can provide motivation and encouragement.
	Adapting the physical activity to meet the needs of the individual with intellectual disabilities is not a recommended practice.

To find out if you have knowledge and are aware of the risks associated with technology and the use of exergames, mark with T (True) or F (False) the following activities.

Assistive technologies	
	I have basic knowledge of assistive technologies designed for people with intellectual disabilities.
	I can install and configure assistive devices or software.
	I know resources to learn more about assistive technologies.
Online security	
	I can identify common online threats, such as spam emails or suspicious websites.
	I know how to create strong and unique passwords.
	I am cautious about sharing personal information online.
Privacy	
	I know the privacy settings on social media platforms and adjust them as necessary.
	I understand the importance of obtaining consent before sharing photographs or personal information of people with disabilities online.
	I can explain the concept of digital footprint and its implications.
Ethical considerations	
	I can describe ethical considerations related to the use of technology in the context of people with disabilities.
	I am aware of the importance of respecting the autonomy and preferences of people with disabilities when using technology.

5.2. Annex 2. Tool 2. Training activity satisfaction questionnaire.

TOOL 2	TRAINING ACTIVITY SATISFACTION QUESTIONNAIRE					
Instructions:	The main objective of this questionnaire is to evaluate your satisfaction with the MOVE-IT training activity. Thanks for your recent participation.					
	Please, could you indicate how satisfied or dissatisfied are you with the training activity?. Please, mark, according to your opinion, the more appropriate square.	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	The training activity considers the ethical issues: gender language, inclusive language, security, privacy, and confidentiality measures.					
2.	The training activity was well-organized.					
3.	The instructions of the training activity are clear.					
4.	The different elements of the training activity have internal coherence.					
5.	As a professional, topics are useful to me.					
6.	Topics were presented clearly.					
7.	The steps and responsibilities after the training activity are clear to me.					
8.	The training activity contents have quality.					
9.	I have learnt how to use the apps.					
10.	I have learnt how to motivate PwID about Physical Activity (PA).					
11.	The training activity has improved my knowledge about the benefits of the practice of Physical Activity (PA) for PwID.					
12.	The training activity has been difficult.					
13.	I am satisfied with the training activity.					
Finally, could you give to us your opinion about the two following open questions?						
What aspects of this training activity will be more useful for your daily life?						
How would you improve this training activity?						

5.3. Annex 3. Tool 3. IPAQ short form.

TOOL 3	IPAQ SHORT FORM	
Instructions:	We are interested in finding out about the kinds of physical activities that the participants do as part of their everyday lives.	
Date:	Phase:	ID Participant:

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last **7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

	Days per week
	No vigorous physical activities → **Skip to question 3**

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

	Hours per day
	Minutes per day
	Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

	Days per week
	No moderate physical activities → **Skip to question 5**

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

	Hours per day
	Minutes per day
	Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the last **7 days**, on how many days did you **walk** for at least 10 minutes at a time?

	Days per week
	No moderate physical activities → **Skip to question 7**

6. How much time did you usually spend **walking** on one of those days?

	Hours per day
	Minutes per day
	Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the last **7 days**, how much time did you spend **sitting** on a **week day**?

	Hours per day
	Minutes per day
	Don't know/Not sure

This is the end of the questionnaire, thank you for participating

5.4. Annex 4. Tool 4. Digital literacy questionnaire.

TOOL 4	DIGITAL LITERACY QUESTIONNAIRE	
Instructions:	This is a 10-item questionnaire to evaluate the digital literacy on the use of mobile apps for people with intellectual disabilities.	
Date:	Phase:	ID Participant:

1. How often do you use a mobile device or tablet?

	Every day
	A few times a week
	A few times a month
	Rarely or never

2. Which mobile apps do you use most often? (List specific apps, if known)

	Social media apps (e.g., Facebook, Instagram)
	Communication apps (e.g., WhatsApp, Messenger)
	Entertainment apps (e.g., YouTube, Netflix)
	Educational apps (e.g., learning games)
	Other (please specify): .....

3. How confident are you in navigating through your mobile device's home screen and opening apps?

	Very confident
	Somewhat confident
	A little confident
	Not confident at all

4. Can you send a message or a text using an app like WhatsApp or Messenger?

	Yes
	No
	I'm not sure

5. Can you take a photo or video using the camera on your mobile device?

	Yes
	No
	I'm not sure

6. Do you know how to adjust the volume or brightness settings on your mobile device?

	Yes
	No
	I'm not sure

7. Have you ever used voice commands (e.g., "Hey Siri" or "OK Google") on your mobile device to perform tasks?

	Yes
	No
	I'm not sure

8. How comfortable are you with using apps to access information, like looking up a website or searching for information?

	Very comfortable
	Somewhat comfortable
	A little comfortable
	Not comfortable at all

9. Are you aware of privacy and safety settings in mobile apps, like setting passwords or controlling who can see your information?

	Yes
	No
	I'm not sure

10. What assistance or support do you need to use mobile apps more comfortably? (Select all that apply)

	I need someone to show me how to use apps.
	I need apps to have simpler and clearer instructions.
	I need help setting up accessibility features.
	I don't need any assistance.

5.5. Annex 5. Tool 5. Training activity satisfaction questionnaire.

TOOL 5	TRAINING ACTIVITY SATISFACTION QUESTIONNAIRE			
Instructions:	The main objective of this questionnaire is to evaluate your satisfaction with the MOVE-IT training activity.			
Date:	Phase:	ID Participant:		
Please, tick the square to indicate how much you agree with the following sentences:				
1.	Do you like doing physical activity?			
2.	Do you like doing physical activity using the phones and tablets?			
3.	Would you like to keep using the phone and tablets to do physical activity?			
4.	Is easy for you to use the phone and tablet alone to do physical activity?			
5.	Would you recommend these games to a friend?			
6.	Has your physical condition improved the last month?			
7.	How would you improve the games?			

5.6. Annex 6. Tool 6. Training activity global satisfaction questionnaire.

TOOL 6	TRAINING ACTIVITY GLOBAL SATISFACTION QUESTIONNAIRE
Instructions:	The main objective of this questionnaire is to evaluate your satisfaction with the MOVE-IT pedagogical model.

	Please, tick the square to indicate how much you agree with the following sentences:	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1.	The pedagogical model improves the social inclusion of PwID					
2.	It promotes a healthy lifestyle in PwID					
3.	It upgrades my competences as educator					
4.	It makes better the teaching quality of my educative center					
5.	I will keep using the model					
6.	The different elements of the model have internal coherence					
7.	PwID have enjoyed using the APPs					
8.	The time scheduled for the Phase 0 "Training for professionals" is appropiate					
9.	The time scheduled for the Phase 1 "PwID supported by a professional" is appropriate					
10.	The time scheduled for the Phase 2 "PwID use the APP´s on voluntary basis" is appropriate					
11.	The evaluation methodology is appropriate					
12.	The app AGA gets the PwID caught to its activities					
13.	The app Sorterius gets the PwID caught to its activities					
14.	The handbook is useful in the framework of the model					
15.	I am satisfied with the model					

Finally, could you give to us your opinion about the two following open questions?
What aspects of this model will be more useful for your working daily life?
How would you improve this model?

Thanks for your information!

5.7. Annex 7. Tool 7A and Tool 7B. Technological features satisfaction questionnaire.

TOOL 7A	GLOBAL SATISFACTION WITH THE SORTERIUS APP					
Instructions:	The main objective of this questionnaire is to evaluate your satisfaction with the Sorterius APP.					
	Please, tick the most appropiate square according to your degree of satisfaction with the Sorterius APP:	Strongly disatisfied	Disatisfied	Neither satisfied nor disatisfied	Satisfied	Strongly satisfied
1.	Navigation through the app's menus and features.					
2.	The loading times of the app's pages and content.					
3.	Visually attractive design.					
4.	The intuitive design.					
5.	Instructions or guidance on how to use its features.					
6.	The accessibility options for users with disabilities.					
7.	The use of the app for first-time users.					
8.	The security measures implemented within the app.					
9.	Ethical issues of the APP					
10.	I Would recommend this app to others based on its technological features, accessibility, usability, and design.					

Thanks for your information!

TOOL 7B	GLOBAL SATISFACTION WITH THE AGA APP					
Instructions:	The main objective of this questionnaire is to evaluate your satisfaction with the AGA APP.					
	Please, tick the most appropiate square according to your degree of satisfaction with the AGA APP:	Strongly disatisfied	Disatisfied	Neither satisfied nor disatisfied	Satisfied	Strongly satisfied
1.	Navigation through the app's menus and features.					
2.	The loading times of the app's pages and content.					
3.	Visually attractive design.					
4.	The intuitive design.					
5.	Instructions or guidance on how to use its features.					
6.	The accessibility options for users with disabilities.					
7.	The use of the app for first-time users.					
8.	The security measures implemented within the app.					
9.	Ethical issues of the APP					
10.	I Would recommend this app to others based on its technological features, accessibility, usability, and design.					

Thanks for your information!

5.8. Annex 8: MOVE-IT Pilot Protocol.

MOVE-IT

PILOT PROTOCOL

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STUDY PROTOCOL

Title.

EXPLORATORY STUDY OF TWO NEW TOOLS TO IMPLEMENT PHYSICAL ACTIVITY THROUGH THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN PERSONS WITH MILD-MODERATE INTELLECTUAL DISABILITY
(THE MOVE-IT PILOT)

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Abstract.

Background: Persons with mild to moderate intellectual disability perform sub-standard physical activity. New information and communication technologies and gamification strategies can increase the uptake of physical activity habits. This pilot aims to evaluate the use of gamified mobile applications to improve physical activity performance in individuals with mild to moderate level of intellectual disability.
Methods: Pre-post evaluation of intervention on a group of 30 individuals with mild to moderate intellectual disability. The study duration is 4 weeks, in which the first 2 weeks consists on a programmed use of two mobile applications to perform physical activity twice a week in sessions of 20 minutes. During the second two 2 weeks participants can use the apps on voluntary basis and there are no programmed sessions. Data is collected at three time points: Baseline, after week 2 and after week 4. Primary outcome measurements are collected with the International Physical Activity Questionnaire Short Form (IPAQ-S), secondary outcome measures are collected with the Digital Competences Questionnaire and Learning Outcomes Questionnaire. Data will be analyzed using paired and grouped conventional nonparametric statistics for quantitative measures and qualitative analysis for open-ended questions.
Discussion: This intervention aims to evaluate the acceptance of gamified mobile applications in the target population. Secondary aims are to explore the effect on physical activity habits and digital literacy.

Keywords.

intellectual disability; physical activity; mobile health app; information and communication technology.

Administrative information.

Title {1}	EXPLORATORY STUDY OF TWO NEW TOOLS TO IMPLEMENT PHYSICAL ACTIVITY THROUGH THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN PERSONS WITH MILD-MODERATE INTELLECTUAL DISABILITY (THE MOVE-IT PILOT)
Trial registration {2a and 2b}.	intended registry: MOVEIT_PILOT
Protocol version {3}	31/10/2023 - V2
Funding {4}	Erasmus + Program. KA2 . SEPIE under 2021-1-ES01 KA220-ADU-000026343 grant
Author details {5a}	Universitat Politècnica de València (UPV) University of Tromso (UiT) Instituto Valenciano de Servicios Sociales (IVASS) CERCI OEIRAS Ospedale Riabilitativo di Mota di Livenza (ORAS)
Name and contact information for the trial sponsor {5b}	none
Role of sponsor {5c}	none

Introduction.

Background and rationale {6a}

Intellectual Disability (ID), also known as cognitive impairment, is characterized by "significant limitations both in intellectual functioning and adaptive behavior as expressed in conceptual, social, and practical adaptive skills" (Schalock et al. 2010). ID differs from person to person and the age of the person, but it is always associated with an impaired cognitive ability. Disability depends not only on health conditions but also and crucially on the extent to which environmental factors supports the full participation and inclusion in the society ("Definition: intellectual disability" 2020) (World Health Organization Europe 2020)[3]. When compared to the general population, people with ID are on an increased risk of health problems (Balogh et al. 2008) (Olsen et al. 2021)[4],[5] worse coverage of health care needs, and difficulties to find appropriate health care (Hermans and Evenhuis 2014; Malt et al. 2013) (Olsen et al. 2023).

Specifically, people with ID have lower levels of physical activity than the general adult population (Stanish et al. 2019) and have a higher incidence of obesity (Folch et al. 2019; Kinnear et al. 2018). There are estimations that 50% of people with ID has a sedentary lifestyle, and 40% of them has low levels of physical activity (Haveman et al. 2011). A review by Dairo et al. (Dairo et al. 2016) found that 9% of the individuals with ID worldwide was able to make the World Health Organization (WHO) recommendation of physical activity. Sedentarism and low levels of physical activity lead to deconditioning, impaired function and reduced independence (Oviedo and Guerra-balic 2017).

We find several barriers for individuals with ID among the reasons of low activity levels: lack of resources for necessary support; reduced physical and behavioural skills; and lack of available programs (Kuijken et al. 2016). Studies for motivating physical activity to people with ID have shown that predictability with routine and familiarity, communication of purpose, and enjoyable and social activities promote motivation and participation (Mahy et al. 2010; Michalsen et al. 2020).The combination of physical activity routines and gamification has led to the theoretical framework of exergames, in which the exercising routines are ruled and supported by game-related resources (F. F. Mueller and Mandryk 2016). Videogames and virtual reality exergames are widely utilized by youth today and they offer particularly attractive features for individuals with IDs (Anderson-Hanley et al. 2011).

Exergames using video games, have been also investigated and found to be promising for individuals with ID (Rosly et al. 2017; Taylor et al. 2016). The use of touch screen devices such as smart-phones, tablets, and iPads has proven to have low cognitive demands and could be used to improve commitment to physical activity (Anzulewicz et al. 2016; Li et al. 2017) and to improve the overall quality of life (Ghahramani and

[3] Nations, U. "Convention on the Rights of Persons with Disabilities (CRPD), U. Nations." (2006).

[4] Monica Isabel Olsen, Erik Søndenaa, Ellen Melbye Langballe, Marianne Berg Halvorsen, Per Wilhelmsen, Erik Bautz-Holter & Audny Anke. Use of health and dental care services in adults with intellectual disability in relation to age and intellectual disability levels, Journal of Intellectual & Developmental Disability. 2023: 48:2, 172-183. DOI: 10.3109/13668250.2022.2109823

[5] Olsen MI, Halvorsen MB, Søndenaa E, Langballe EM, Bautz-Holter E, Stensland E, Tessem S, Anke A. How do multimorbidity and lifestyle factors impact the perceived health of adults with intellectual disabilities? J Intellect Disabil Res. 2021 Aug;65(8):772-783. doi: 10.1111/jir.12845. Epub 2021 May 11. PMID: 33977582.

Wang 2019). However, implementing these solutions in an effective manner requires meeting the user's needs by systematically analysing user preferences (Antypas and Wangberg 2014) (Michalsen et al. 2023)[6].

Physical activity has shown to have positive effects on cardiovascular and psychosocial health of individuals with ID. Exergames links physical activity to a video game or entertainment control and may yield better compliance with exercise. Moreover, rewards and being praised for performance in forms of feedback, medals, or awards - which is easily implementable in an exergame - has proven to be a promising way to add interest to physical activity for individuals with ID (Temple 2009), however, usually the persons assisting people with IDs (professionals or caregiver) frequently do not have the required knowledge and skills to promote its use. This project will design and develop prototypes of game-based eHealth solutions for behavior change and health promotion by influencing physical activity which have been explored and found to be promising in people with ID.

Objectives {7}

- To promote the healthy lifestyle and social inclusion of Persons with Intellectual Disabilities through their participation in ICT based exergames, in cooperation with other Persons with Intellectual Disabilities and relatives through the use of app based exergames.
- reduce disparities in access to and engagement with digital technologies by Persons with Intellectual Disabilities, relatives and professionals.
- Extend and develop the competences of Persons with mild-moderate levels of Intellectual Disabilities and personnel (relatives and professionals) who support Persons with intellectual Disabilities through the transference of knowledge and the use of tools related with the gamification of physical activity programs and exercises supported by Digital Tools.

Trial design {8}

A pre-post intervention trial to assess the impact of an intervention on a specific outcome in the target population. In this design, data is collected from the same group of individuals both before and after the intervention is implemented, and a follow-up 4 weeks after the intervention. The pre-intervention data serves as a baseline measurement, while the post-intervention and follow-up data will used to evaluate any changes or differences that result from the intervention.

We aim to examine the effect of the intervention by comparing the outcome measures before and after its implementation, without the need for a control group. Potential confounding variables and limitations when interpreting the results of pre-post intervention trials will be dully considered. The intervention will be implemented in two different locations: CERCI OEIRAS (Portugal) and IVASS centers (Spain) in order to minimize external factors that may influence the observed changes.

Study setting {9}

The study will be done in CERCI OEIRAS (Lisbon, Portugal) and IVASS Day Care Centers (Valencia Region, Spain). CERCI OEIRAS is a social care cooperative working in the defence of the Rights of People with

[6] Michalsen H, Henriksen A, Pettersen G, Hartvigsen G, Wangberg S, Thrane G, Jahnsen R, Anke A. Using mobile health to encourage physical activity in individuals with intellectual disability: a pilot mixed methods feasibility study. Front Rehabil Sci. 2023 Aug 24;4:1225641. doi: 10.3389/fresc.2023.1225641. PMID: 37691911; PMCID: PMC10483399.

Disabilities, supporting their participation and integration in social and professional life, promoting the full exercise of their citizenship through an integrated set of actions and services. In their activities plan, the intervention on the field of exercise is very present, with a vast offer of physical activities perform indoor the organization and in the community. IVASS stands for "Instituto Valenciano de Atención Social y Sociosanitaria," which translates to the Valencian Institute of Social and Socio-Health Care. It is an agency within the Valencia Region of Spain that is responsible for managing and providing social and healthcare services. IVASS plays a key role in the region's healthcare and social care system, particularly in the administration and coordination of services for the elderly, dependent individuals, and individuals with disabilities. Its mission is to ensure the well-being and quality of life of these populations by offering various healthcare and social assistance programs and services.

Eligibility criteria {10}

In this study, the inclusion criteria consist of individuals who exhibit a low level of physical activity, possess basic knowledge of smartphone operation and mobile applications, and are willing to provide informed consent after receiving an information sheet about the research.

Exclusion criteria identify individuals who are not suitable for the study due to their inability to be aware of their surroundings when using the app, indicating a potential safety concern, as well as those with visual impairments, as the study may require visual interaction with the smartphone or app. These criteria are established to ensure the safety, comprehension, and suitability of participants in the research, allowing for a more targeted and informed investigation into the relationship between physical activity and smartphone app usage.

Who will take informed consent? {26a}

Informed consent will be obtained by the legal tutor or representative of the participant, who can be the subject him/herself in some cases.

Additional consent provisions for collection and use of participant data and biological specimens {26b}

Not applicable

Interventions.

Explanation for the choice of comparators {6b}

In this pre-post interventional study designed to investigate the acceptability of the tools, as well as to explore increase in physical activity habits, the primary outcome will be measured with the International

Physical Activity Questionnaire Short Form (IPAQ-S)[7]. The main comparator will be the Self-Comparison, where each participant serves as their own control or reference to estimate the effect. The study will compare each participant's pre-intervention physical activity levels with their post-intervention levels. This analysis will be also aggregated, to compare the grouped effects of the intervention (mean/median and standard deviation) to minimize factors affecting to single subjects.
Acceptance will be investigated…
Secondary outcomes for Digital Competences and Learning Outcomes of the training framework will be evaluated with two separate questionnaires. The main comparator will be a quantitatitative score based on the answers provided in the questionnaires. Questionnaire

Intervention description {11a}

The intervention will consist on four phases:

1) Training to physiotherapists and monitors of the institutions participating in the study on the use of Exergaming and ICTs to motivate physical activity. This training will also include a description of the intervention protocol.
2) In the baseline, the recruited participants (those who meet the inclusion criteria) and monitors will be instructed on the use of the apps and baseline data will be collected by means of three questionnaires: IPAQ and Digital Literacy. IPAQ will be only done in participants with intellectual disability who met the inclusion criteria. After the baseline data collection and during 2 weeks, the participants will implement 3 sessions per week of physical activity supported with the two mobile apps: Sorterious and AGA.
3) After these 2 weeks, the post-intervention data will be collected by means of the same questionnaires: IPAQ and Digital Literacy. IPAQ will be only done in participants with intellectual disability who met the inclusion criteria and completed 5 out of the 6 programmed sessions.
4) After 2 weeks from the post-intervention sampling, the follow-up data will be collected by means of the same questionnaires: IPAQ, Digital Literacy and Learning Ouctomes. IPAQ will be only done in participants with intellectual disability.

The intervention sessions will consist of the following structure:

1. Introduction (5 minutes):
   Briefly introduce the session and its goals.
   Welcome participants and create a positive and inclusive atmosphere.
   Briefly explain the benefits of physical activity.
2. (Only in the first session) App Introduction and Instructions (10 minutes):
   Introduce the Sortreius or AGA app and explain its features.
      Demonstrate how to navigate the app, emphasizing simplicity and user-friendliness.
      Provide step-by-step instructions on how to use the app for the exercises.
      Encourage questions and ensure everyone is comfortable using the app.
3. Warm-Up (5 minutes):
   Lead a group warm-up to prepare participants for the exercises.
   Incorporate simple and engaging warm-up activities suitable for all fitness levels.
4. Independent App Use (20 minutes):

[7] Lee, Paul H., et al. "Validity of the international physical activity questionnaire short form (IPAQ-SF): A systematic review." *International journal of behavioral nutrition and physical activity* 8.1 (2011): 1-11.

Guide participants through the first set of exercises, demonstrating proper form and technique.
Transition to independent app use by participants.
Emphasize inclusivity and offer modifications for varying abilities.
Encourage participants to ask questions or seek assistance if needed.
Circulate around the room, providing individual assistance and encouragement.
Ensure everyone is comfortable using the app independently.

6. Cool Down and Stretching (5 minutes):
   Lead a cool-down routine to help participants gradually lower their heart rate.
   Include gentle stretches focusing on major muscle groups.
   Talk about the session.

Criteria for discontinuing or modifying allocated interventions {11b}

The criteria for discontinuing or modifying allocated interventions plays a crucial role in ensuring the safety, well-being, and feasibility of the research. The criteria is to monitor the intervention's impact and to safeguard the participants' best interests. Discontinuation or modification includes situations where participants experience adverse effects or discomfort related to the app usage or if there are any significant challenges in the app's usability specific to condition or circumstance of the participant. Additionally, the discontinuation criteria encompasses any unforeseen ethical, logistical, or practical issue that emerge during the study, which may necessitate intervention adjustments or even discontinuation if the safety or ethical integrity of the research is compromised. Discontinuation will be registered as part of the study.

Strategies to improve adherence to interventions {11c}

The research team will perform weekly virtual meetings before and after de intervention, and during the follow-up phase. Associations will provide smartphones or tablets to implement the session with the apps whenever the participant has not its own device.

Relevant concomitant care permitted or prohibited during the trial {11d}

Not applicable

Provisions for post-trial care {30}

Not applicable

Outcomes {12}

Type of outcome	Measurement and instrument	Analysis metric	Method	Timepoints
Primary	Metabolic Equivalent (MET) in minutes per week (IPAQ-S)	Change from the baseline	Paired analysis and aggregated analysis (mean/median +- sd)	Baseline 2 weeks 4 weeks
Secondary	Digital Literacy (Questionnaire)	Change from the baseline	Paired analysis	Baseline 4 weeks
Secondary	Learning Outcomes (Questionnaire)	Change from the baseline	Paired analysis	Baseline 4 weeks

The IPAQ-S is, more acceptable than an activity tracker, and thereby more suitable for individuals with severe and profound ID [8]. METs, or Metabolic Equivalents, are a measure used in exercise physiology and clinical research to quantify the energy expenditure associated with various physical activities. They provide a standard for comparing the energy costs of different activities and can be clinically relevant.

Participant timeline {13}

- Baseline (Week 0): Enrollment, data collection and Training. Start the physical activity program with the use of apps.
- Post intervention (Week 2). Intervention finishes. Data collection.
- Follow-up (Week 4). Data collection

Sample size {14}

Sample size is calculated on the anticipated mean and standard deviation of the energy cost of walking at 3.0 km/h. Energy expenditure data is highly heterogeneous and scarce for the target population; therefore reference values were derived from data from similar studies ([9],[10]). Standard formulas for sample size determination were used in order to obtain the desired sample size for a two-tailed single-sample t-test with the following requirements: power = .90, α = .05, d = 0.5 (medium effect). The desired sample size was calculated to be 36. A similar figure was obtained for an a priori power analysis for the mixed ANOVA with two repetitions and two groups (i.e., one between-subjects and another between two groups) with the following parameters: power = .9, f = 0.25 (medium), α = .05. Accounting for a 15% drop-out ratio the final sample size estimation is 43 participants with intellectual disabilities.

Recruitment {15}

Achieving adequate participant enrollment to meet the target sample size in this pilot is essential for the validity of the results. The first measure to ensure participation is a clear and compelling communication of the study's purpose, benefits, and potential contributions to the participants. Engaging with professionals in the two study settings is crucial to build trust and credibility. Regular follow-up and communication with the local managers of the study may maintain their interest and commitment throughout the study. Adapting recruitment strategies based on ongoing feedback and tracking the progress of enrollment can ensure that the target sample size is met in a timely and effective manner. At the end of the study, participants should receive a report on the study achievements and results.

Assignment of interventions: allocation.

Not applicable

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[8] Michalsen H, Henriksen A, Pettersen G, Hartvigsen G, Wangberg S, Thrane G, Jahnsen R and Anke A (2023) Using mobile health to encourage physical activity in individuals with intellectual disability: a pilot mixed methods feasibility study. Front. Rehabil. Sci. 4:1225641. doi: 10.3389/fresc.2023.1225641

[9] Agiovlasitis, S., Choi, P., Allred, A. T., Xu, J., & Motl, R. W. (2020). Systematic review of sedentary behaviour in people with Down syndrome across the lifespan: A clarion call. Journal of Applied Research in Intellectual Disabilities, 33(2), 146-159

[10] Reece, Jeff Walkley, Energy expended by adults with and without intellectual disabilities during activities of daily living, Research in Developmental Disabilities, Volume 31, Issue 6, 2010, Pages 1380-1389, ISSN 0891-4222, https://doi.org/10.1016/j.ridd.2010.06.022

Sequence generation {16a}

Numerical identifiers will be randomly generated and assigned to each participant upon registration for registering into the Sorterious app. Participants will be not allocated into groups.

Concealment mechanism {16b}

Not applicable

Implementation {16c}

Not applicable

Assignment of interventions: Blinding.

Who will be blinded {17a}

Not applicable

Procedure for unblinding if needed {17b}.

Not applicable

Data collection and management.

Plans for assessment and collection of outcomes {18a}

Baseline data will be collected through comprehensive participant assessments, capturing relevant information. Outcome data, central to the study's objectives, will be meticulously gathered using validated measurement tool IPAQ directly and indirectly. Data collection from the questionnaires processes will include a structured interview conducted by trained personnel to maintain consistency and accuracy. Additionally, electronic data capture systems will be employed, ensuring secure and real-time data entry on the use of the apps (duration and number of interactions). To minimize missing data, reminders and follow-up procedures will be implemented, and data will be regularly monitored for completeness and accuracy. All collected data will be subjected to rigorous validation and verification procedures, and any inconsistencies will be promptly addressed.

Data from questionnaires will be centralized in the two study settings and once anonymized, digitalized for secure storage in the UPV centers.

Study instruments (Annex I):

- IPAQ-S
- Digital literacy
- Learning Outcomes

Plans to promote participant retention and complete follow-up {18b}

Data of discontinued participants will not be used for the analysis.

Data management {19}

Data entry will be conducted using secure electronic systems, ensuring accurate recording of participant responses and assessments. To promote data quality, double-entry verification and validation checks will be implemented, reducing the risk of errors and enhancing reliability. Each data point will be assigned a unique identifier and stored without personally identifiable information to protect participant privacy. Access to the data will be strictly controlled and limited to authorized personnel. Data security measures, including encryption and password protection, will safeguard against unauthorized access. Weekly backups, both on-site (MOVEIT server) and off-site (external server), will prevent data loss, and disaster recovery protocols will be in place to ensure the preservation of valuable research data.

Confidentiality {27}

The protection of personal information and confidentiality of potential and enrolled participants is of utmost importance throughout all phases of the pilot. Prior to the trial, personal information will be collected through secure and confidential means, ensuring that only essential data is gathered, and participants are informed about the purposes of data collection. During the trial, any shared information will be de-identified, with data points assigned unique numerical identifiers, preventing any linkage to specific individuals. Access to personal information will be strictly limited to authorized personnel, and robust data security measures, including encryption and password protection, will be in place to safeguard this information. After the trial, all personal data will be securely archived and retained in compliance with relevant data protection regulations. Any published results or reports will only contain aggregated and anonymized data, further preserving confidentiality.

Plans for collection, laboratory evaluation and storage of biological specimens for genetic or molecular analysis in this trial/future use {33}

Statistical methods.

Statistical methods for primary and secondary outcomes {20a}

The first part of the statistical analysis will involve a comprehensive descriptive statistical analysis, including quality assessment (missing data, outliers, normality and balance). The primary outcome measure of interest is the level of physical activity, which was quantified in METs (Metabolic Equivalents), treated as a continuous variable. METs are a reliable measure of energy expenditure during physical activities and provide valuable insights into individuals' activity levels during a period of time.

Additionally, we investigate two secondary outcomes: digital literacy and participants' learning outcomes as assessed through the questionnaires in Annex I. The preferred statistical test for a pre-post study in which a comparison between measurements is done before and after an intervention within the same group are the paired t-test and the Wilcoxon signed-rank test. The choice between the two depends on the underlying assumptions of the data as resulting from the descriptive analysis. Data normality for continuous variables will be assessed by visual inspection (normal probability plot), and skewness (k><2) and by conducting a normality test, such as the Shapiro-Wilk test.

The paired T-Test will be applied upon appropriate for normally distributed data or data that approximates a normal distribution in which it is assumed that the differences between pre and post measurements are normally distributed, and variances are roughly equal. This test is applied to continuous data, and the differences between pre and post measurements are close to being normally distributed.

A Wilcoxon Signed-Rank Test will be applied if the data is not normally distributed or when the variables are dealing with ordinal or ranked data. This test will be applied if the descriptive analysis results in an un-specific distribution for the differences between pre and post measurements.

Interim analyses {21b}

No interim analyses will be performed.

Methods for additional analyses (e.g. subgroup analyses) {20b}

In the probable case of sub-group analysis, a paired one-way ANOVA test will be implemented to assess the inter group differences in the primary and secondary outcomes.

Methods in analysis to handle protocol non-adherence and any statistical methods to handle missing data {20c}

To mitigate the potential impact of protocol non-adherence, clear and comprehensive instructions will be provided to both participants and instructors, as well as regular monitoring and follow-up to promote adherence to the study protocol. Reasons and circumstances for protocol non-adherence cases will be documented and sensitivity analyses will be performed to assess the robustness of the results to potential deviations from the protocol.

Missing data will be handled on stablished statistical methods to minimize bias and optimize the use of available information. Pattern and mechanism for missing data management, such as whether if it will be missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR) will be considered. Depending on the nature of the missing data, suitable techniques such as multiple imputation, maximum likelihood estimation, or appropriate model-based approaches to impute missing values will be used. The goal is to ensure that conducted analyses accounted for the uncertainty introduced by missing data, thus providing more accurate and reliable results.

Plans to give access to the full protocol, participant level-data and statistical code {31c}

All the tools, analyses and results will be publicly available.

Oversight and monitoring.

Composition of the coordinating centre and trial steering committee {5d}

The study committee will be the following:

- Coordination: Antonio Martinez (UPV)
- Pilot setting coordination: Maria Sorzano (IVASS) and Duarte Correia (CERCI OEIRAS)
- Statistical analysis: Andrea García Montaner (UPV)
- ICT tools: André Hendriksen (UiT)

Composition of the data monitoring committee, its role and reporting structure {21a}

Same as above.

Adverse event reporting and harms {22}

Adverse event reporting and monitoring for potential harms is established through a system for collecting, documenting, and analyzing any adverse events that may occur during the study. Pilot setting coordinators will be responsible for promptly identifying, recording, and evaluating adverse events, whether they are directly related to the study interventions or occur as a result of other factors. The protocol adheres to ethical guidelines and regulatory requirements in reporting any serious adverse events to the relevant

authorities and institutional review boards as necessary. Additionally, the research protocol includes provisions for monitoring potential harms to participants and will implement measures to mitigate risks and protect the rights and safety of all involved individuals.

Frequency and plans for auditing trial conduct {23}

Plans for communicating important protocol amendments to relevant parties (e.g. trial participants, ethical committees) {25}

No amendments are foreseen.

Dissemination plans {31a}

This study is committed to effective dissemination of its findings to maximize the impact of the training framework and to contribute to the broader knowledge of accessible ICTs for persons with intellectual disabilities and the promotion of physical activity habits. Dissemination plans encompass a multi-faceted approach that includes peer-reviewed publications in indexed scientific journals, relevant conferences and symposia, as well as engagement with key stakeholders in multiplier events.
All the information related to the study will be accessible through the project web site (https://moveit.webs.upv.es/) and social media channels.

Declarations.

Acknowledgements

Authors' contributions {31b}

Funding {4}

Erasmus + Program. KA2 . SEPIE under 2021-1-ES01 KA220-ADU-000026343 grant

Availability of data and materials {29}

Materials and resources are available in EN, SP, PT, IT and NO in the project website. Data will be available upon request through the project website.

Ethics approval and consent to participate {24}

Ethics approval has been obtained from the UPV Ethical Committee ensuring that the study adheres to the highest ethical standards and safeguards the rights, safety, and welfare of all participants. Informed consent is an essential component of the research process, and every individual involved in the study, including participants and their legal guardians if applicable, will be provided with clear and comprehensible information about the study's purpose, procedures, potential risks, and benefits. They will be given the opportunity to ask questions and are encouraged to make a fully informed decision regarding their participation. Their voluntary, written consent should be obtained before any study-related activities commence. The research team is dedicated to upholding ethical principles, respecting the autonomy and dignity of all participants, and ensuring that the study will be conducted with the utmost integrity and transparency.

Consent for publication {32}

Not applicable

Competing interests {28}

Participating entities declare no competing interests in the execution of this study. Any partner is economically benefiting from this action.

ANNEX I. Study Questionnaires

IPAQ Short Form.

We are interested in finding out about the kinds of physical activities that the participants do as part of their everyday lives. The questions will ask about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time. 1.

During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

___ days per week

☐ No vigorous physical activities → *Skip to question 3*

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

___ hours per day
___ minutes per day

☐ Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

During the last 7 days**, on how many days did you do** moderate **physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.**

___ days per week

☐ No moderate physical activities → *Skip to question 5*

3. How much time did you usually spend doing moderate physical activities on one of those days?

___ hours per day
___ minutes per day

☐ Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

4. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

___ days per week

☐ No moderate physical activities → *Skip to question 7*

5. How much time did you usually spend **walking** on one of those days?

___ hours per day
___ minutes per day

☐ Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

6. During the **last 7 days**, how much time did you spend **sitting** on a **weekday**?

___ hours per day
___ minutes per day

☐ Don't know/Not sure

This is the end of the questionnaire, thank you for participating

Digital Literacy.

This is a 10-item questionnaire to evaluate the digital literacy on the use of mobile apps for people with intellectual disabilities.

1. How often do you use a mobile device or tablet?
   - [ ] Every day
   - [ ] A few times a week
   - [ ] A few times a month
   - [ ] Rarely or never

2. Which mobile apps do you use most often? (List specific apps, if known)
   - [ ] Social media apps (e.g., Facebook, Instagram)
   - [ ] Communication apps (e.g., WhatsApp, Messenger)
   - [ ] Entertainment & Music apps (e.g., YouTube, Netflix, Spotify)
   - [ ] Educational apps & Photos (e.g., learning games)
   - [ ] Other (please specify): _____

3. How confident are you in navigating through your mobile device's home screen and opening apps?
   - [ ] Very confident
   - [ ] Somewhat confident
   - [ ] A little confident
   - [ ] Not confident at all

4. Can you send a message or a text using an app like WhatsApp or Messenger?
   - [ ] Yes
   - [ ] No
   - [ ] I'm not sure

5. Can you take a photo or video using the camera on your mobile device?
   - [ ] Yes
   - [ ] No
   - [ ] I'm not sure

6. Do you know how to adjust the volume or brightness settings on your mobile device?
   - [ ] Yes
   - [ ] No
   - [ ] I'm not sure

7. Have you ever used voice commands (e.g., "Hey Siri" or "OK Google") on your mobile device to perform tasks?
   - [ ] Yes
   - [ ] No
   - [ ] I'm not sure

8. How comfortable are you with using apps to access information, like looking up a website or searching for information?
   - [ ] Very comfortable

- [ ] Somewhat comfortable
- [ ] A little comfortable
- [ ] Not comfortable at all

9. Are you aware of privacy and safety settings in mobile apps, like setting passwords or controlling who can see your information?
- [ ] Yes
- [ ] No
- [ ] I'm not sure

10. What assistance or support do you need to use mobile apps more comfortably? (Select all that apply)
- [ ] I need someone to show me how to use apps.
- [ ] I need apps to have simpler and clearer instructions.
- [ ] I need help setting up accessibility features.
- [ ] I don't need any assistance.

Learning Outcomes.

The MOVEIT pilots are organized with the objective of improving knowledge about Physical Activity, knowing how to develop a physical activity program, improving ICT skills and promoting the use of exergaming in people with intellectual disabilities.

Next, you will be asked a series of questions related to the training you have just received to evaluate the learning obtained with the MOVEIT materials.

Questionnaire.

1. **How do the theoretical systems below define intellectual disability? Connect each one with the corresponding definition.**

ICD-10	A condition of arrested or incomplete mental development, characterized especially by the deterioration of skills manifested during the period of development, skills that contribute to the general level of intelligence, that is, cognitive, linguistic, motor and social skills.
DSM-5	The notion of IQ has been adopted as a significant statistical factor for an adequate diagnosis at the level of cognitive functioning.
ICF	In the recent version, the notion of mental retardation has been changed to the notion of 'Intellectual Development Disorder'.
WHO	Defines intellectual disability according to the interaction between the notion of activity limitation and deficiencies.

2. **How do the following models or theories define "Motivation?" Connect each one with the corresponding definition.**

Behavioral Theory of Behavior	The concept of self-efficacy plays a central role. People would have specific beliefs about themselves and their abilities to do something: these ideas would represent the background of each action and regulate motivation levels.
Bandura's motivation model	Motivation can be classified as not present, present thanks to intrinsic motivation (interesting, achievable in itself), present thanks to extrinsic and external motivation factors (e.g., specific rewards, positive feedback).
Self-Determination Theory	The concept of self-efficacy plays a central role. People would have specific beliefs about themselves and their abilities to do something: these ideas would represent the background of each action and regulate motivation levels.

3. **Regarding DOMS (Delayed Onset Muscle Pain), indicate True (T) or False (F).**

Regardless of the physical activity performed, it is not possible to prevent DOMS	T	F
Stop if you feel extreme pain	T	F
There are specific remedies for DOMS	T	F
One week is enough to increase the intensity level when we introduce a new exercise into the routine.	T	F
It is important to make soft progressions and alternate it with rest	T	F

4. **Indicate whether the following images represent aerobic or anaerobic exercise.**

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5. **The following definitions of intellectual disability, what classification do they correspond to?**

Mild	People with intellectual disabilities are slower in all areas of conceptual development, social skills and daily living. These people can learn practical life skills, allowing them to live independently with minimal levels of need for support.
Moderate	People with this intellectual disability usually have congenital syndromes with significant delays in all areas, cannot live independently and require close supervision and help in self-care activities. They have very limited ability to communicate and often have physical limitations.
Profound	People with this intellectual disability have notable developmental delays and may have physical signs of impairment. Your self-care requires moderate support. They have good communication skills, but usually cannot communicate on complex topics. These people can take care of themselves, but they may need more instruction and support than the typical person.
Severe	People with this intellectual disability have the ability to understand speech, but otherwise have limited communication skills and can only communicate at the most basic levels. They cannot successfully live an independent life and will need to live in an occupational center.

6. **In a muscle strengthening session, rank the following parts from 1 to 5 in order.**

Return to calm and stretch _____

Cardiovascular exercise _____

Balance and coordination exercises _____

Warm-up_____

Muscle strengthening _____

7. In the following situations when performing physical exercise, indicate whether it is more advisable to continue or stop the activity?






ACTIVITIES

To find out if you have knowledge and are aware of the risks associated with technology and the use of exergames, complete the following activities.

Activity 1: Rate each item on a scale of 1 to 5, with 1 being strongly disagree and 5 being strongly agree.

Assistive technologies	
	I have basic knowledge of assistive technologies designed for people with intellectual disabilities.
	I can install and configure assistive devices or software.
	I know resources to learn more about assistive technologies.
Online security	
	I can identify common online threats, such as spam emails or suspicious websites.
	I know how to create strong and unique passwords.
	I am cautious about sharing personal information online.
Privacy	
	I know the privacy settings on social media platforms and adjust them as necessary.
	I understand the importance of obtaining consent before sharing photographs or personal information of people with disabilities online.
	I can explain the concept of digital footprint and its implications.
Ethical considerations	
	I can describe ethical considerations related to the use of technology in the context of people with disabilities.
	I am aware of the importance of respecting the autonomy and preferences of people with disabilities when using technology.

Activity 2: ICT Integration

Select a type of exercise	
	Fine motor skills
	Gross motor skills
	Aerobic capacity/endurance
Choose 2 or 3 types of technologies	
	Wearable sensors
	Apps
	Augmented reality
	Guided exercise
	Telemetry
	Serious Games
Identify business elements	
Item #1	
Item #2	
Item #3	
Develop a routine	

ANNEX II. Information Sheet.

Title of the project: Development of a training program to improve the levels of activity and physical exercise of people with intellectual disabilities through exergames and technology (MOVE-IT).

Project information.

With this document we give you information and invite you to participate in these pilot activities. Before deciding on your participation, read this document carefully and request any additional information you deem appropriate. It is important that you know and understand all aspects of the project.
You can withdraw your consent whenever you wish.
Tell us if you have questions or need more information. Feel free to ask questions about any aspect that will help you clarify your doubts about it.

PROJECT

People with intellectual disabilities tend to have lower levels of physical activity compared to the general adult population and have a higher incidence of obesity. Some estimates establish that 50% of people with intellectual disabilities follow a sedentary lifestyle, presenting a low level of physical activity in 40% of cases. Sedentary lifestyle and these low levels of physical activity lead to problems that affect Their independence. MOVE-IT proposes an innovative methodology based on the implementation of applications and the development of a training program to improve the skills of staff and caregivers of people with intellectual disabilities, giving them the necessary skills to guide physical activity programs and use ICT to through exergames.
The objective of the project **MOVE-IT** is "*design and develop a combined education and intervention program to promote physical activity in people with intellectual disabilities both at home, in institutions or in the community through the use of technological exergames*".
Within the MOVE-IT project, these specific pilots have the objective of "*use the materials produced involving real end users (staff and people with intellectual disabilities) to evaluate the feasibility of the training course and provide recommendations for future exploitation*".
The MOVE-IT project is being developed within the ERASMUS+ 2021 PROGRAM. It started in November 2021 and will end in February 2024 (28 months).
The consortium that carries it out is made up of: Universitat Politècnica de València (coordinator), Institut Valencià de Serveis Socials (IVASS) (Spain), Cercioeiras (Portugal), ORAS Rehabilitation Center (Italy) and University of Tromso (Norway).

SELECTION OF PARTICIPANTS

We are inviting both people with intellectual disabilities and their professionals and caregivers to the pilots.

VOLUNTARY PARTICIPATION

Your participation in this research is completely voluntary. You can decide to participate or not.

COSTS AND FINANCING

The development of the pilot activities will not entail any financial cost to the participants. All costs will be covered by the project **MOVE-IT**, funded by the European Commission through the competitive call for ERASMUS + projects.

RISKS ASSOCIATED WITH RESEARCH

There are no physical or psychological risks during participation in this research.

RIGHT TO REFUSE OR WITHDRAW

You do not have to participate in that activity.

ANNEX III. Informed Consent

This activity in which you participate is operated by UPV SABIEN and whose registered address is Camino de Vera s/n, Edificio 8G. Access B, 1st floor, 46022 Valencia we are committed to protecting and preserving the privacy of participants when carrying out pilot activities within the framework of the MOVEIT project.

This policy sets out how we process personal data that we collect from you or that you provide to us through electronic means. We confirm that we will keep your information secure and fully comply with all applicable EU laws and regulations. Please read the following carefully to understand what happens to the personal data you choose to provide to us or that we collect from you when you visit this site. By participating or registering in project activities (our website) you are accepting and consenting to the practices described in this policy.

Types of personal information we may collect from you.

We may collect, store and use the following types of personal information about people participating in project activities:

Information you provide to us. You can provide us with information about yourself by filling out forms on our website or on paper. This includes information you provide when you submit a contact/inquiry form. The information you provide to us may include your name, address, email address and telephone number and other personal information relating to your situation.

How may we use the information we collect?

We use information in the following ways:

Information you provide to us. We will use this information:

- To provide you with information and/or services that you request from us;
- To validate the activities that we have developed and are testing in these pilots.
- To report on the progress of the project activities to the consortium partners, the financing entity, and in dissemination and dissemination activities. No personally identifiable data will be included in the reports.
- We may take photographs/videos of the activity for dissemination and reporting purposes. Any personal and sensitive information, such as faces, will be blurred.

Disclosure of your information

Any information you provide to us will be sent directly to us by email or stored on a secure server located in the EU. We use a trusted corporate website and hosting provider to facilitate project operation and management.

We do not rent, sell, or share personal information about you with other people or unaffiliated companies. We will use reasonable efforts to ensure that your personal data is not disclosed to regional/national institutions and authorities, unless required by law or other regulations.

Unfortunately, the transmission of information over the Internet is not completely secure. Although we will do our best to protect your personal data, we cannot guarantee the security of your data transmitted to our site; Any transmission is at your own risk. Once we have received your information, we will use strict procedures and security features to try to prevent unauthorized access.

Your rights: access to your personal data

You have the right to ensure that your personal data is processed lawfully ("Right of Access"). Your right of access can be exercised in accordance with data protection laws and regulations. Any request for access to a topic must be made in writing to anmarmil@itaca.upv.es. We will provide you with your personal data within the legal deadlines. To enable us to track any of your personal data we may have, we may need to request more information from you. If you have a complaint about how we have used your information, you have the right to lodge a complaint with the Information Commissioner's Office (ICO).

Changes to our privacy policy

Any changes we may make to our privacy policy in the future will be posted on this page and, where appropriate, notified to you by email. Please check back frequently for any updates or changes to our privacy policy.

Contact

Questions, comments and requests regarding this privacy policy are welcome and should be directed to Antonio Martínez Millana, anmarmil@itaca.upv.es.

Consent

Hereby, being informed about the activity and being aware about the use of my personal information, I voluntarily agree to participate and provide the requested information.

Signature: _____

Date: _____