Game4CoSkills

Trainers' Toolkit

Summary

Chapter 1. Introduction and methodology used

1.1 Introduction

This trainers' toolkit is realised in the framework of the project "Mobile game for cognitive skills development and concept teaching for adults with intellectual disabilities" (acronym "Game4CoSkills") developed in the programme Erasmus+ KA220-ADU Cooperation partnerships in adult education.

The project aims to develop an e-game for developing cognitive skills and teaching concepts for adults with intellectual disabilities to be used individually or in groups (intellectual disability is a term used when a person has certain limitations in mental functioning and in skills such as communicating, in taking care of themselves or in social skills: these limitations normally cause a person to learn and develop more slowly than others).

So, the project objective is directed on creating helpful and useful tools to the project target groups that are:

- Adults with intellectual disabilities
- Trainers of adults with intellectual disabilities
- Among the tools, the project has developed a trainer toolkit to increase:
- the knowledge of trainers of adults with intellectual disabilities about requirements, scenarios, instructional methods, training needs, objectives, methodologies to use developed mobile game;
- the capacity of trainers (of adults with intellectual disabilities) to use assessment tools;
- the usability and effectiveness of developed mobile games for cognitive skills development and concept teaching;
- the motivation of trainers in working with the target group with encouraging animation video.

With this toolkit, the trainers can work with different target groups such as senior people with dementia, Alzheimer's.

The essential purposes of the "Trainers' toolkit" are:

- to describe the requirements, scenarios, instructional methods, training needs, objectives, methodologies.
- to develop the assessment tool for trainers to apply pre-test and post-test to follow the progress of adults with intellectual disabilities in cognitive skills development and concept learning.

For this reason, a specific methodology was developed for constructing the toolkit that is described in the next chapter.

1.2 The partnership

The partnership that developed the toolkit is made up of the following organisations:

- **INTERACTIVE 4D** (France – project coordinator),
- **AUSTRIAN ASSOCIATION OF INCLUSIVE SOCIETY** (Austria),
- **SYNTHESIS CENTER FOR RESEARCH AND EDUCATION LIMITED** (Cyprus),
- **AVRASYA YENILIKÇI TOPLUM DERNEGI** (Turkey),
- **ELLINIKI ETAIRIA NOSOY ALZHEIMER KAI SYGGENON DIATARACHON SOMATEIO** (Greece),
- **EURO-NET** (Italy)

1.3 Toolkit Methodology

1.3.1 Aim of the Toolkit

The essential purpose of Trainers' toolkit" is to verify the usability of the games developed by adult trainers that work with persons with intellectual disabilities. The term toolkit (literally "toolbox") is a set of tools used to facilitate and standardise the development of more complex applications. The toolkit systematised the experiences, good practices and materials collected during the project and is aimed at trainers of people with disabilities in order to facilitate their work with disadvantaged people.

1.3.2 Main Outcomes

The main outcomes of the toolkit are:

- Pre-test
- Post-test
- Training reflection
- Group activity observation
- Cognitive skills and concept learning checklist
- Animation video
- Piloting report
- Case studies

- Paper brochure.

1.3.3 How the Toolkit was developed

Starting from the fact that the toolkit is directed to evaluate the effectiveness of the developed electronic games and their concrete possibility of being used by trainers of adults with intellectual disabilities, the toolkit was developed realizing the following steps.

1. Development of an online pre-test for a group of trainers for each partner country with questions directed to verify the level of knowledge and the use of electronic games in training. The test, then, was developed by all partners in their own countries.

2. Development of an online post-test for a group of trainers for each partner country to verify the level of knowledge and use of electronic games in training after using our mobile games. The test, then, was developed by all partners in their own countries,

3. Realization of a specific report on the results of both indicated tests included in this kit on a precise chapter specifically dedicated

4. Verification of the results on the effective use of the mobile games with another test to evaluate the group activity and dedicated to verify if the mobile games help the possibility to work in group with the target group and facilitate the group activity

5. Realization of a cognitive skills and concept learning checklist, starting from the result of the 3rd test.

After the testing phases, the partners worked on the structure of the toolkit and in finding n.2 cases studies per organization.

The chapters developed are the following:

- Introduction and methodology used

- The mobile games

- Scenarios used

- Training needs

- Objectives

- Instructional methods

- Case studies

The following step was to organise advisory board meetings in each partner's country to verify that the structure of the toolkit was in line with the target group necessities and with the project objectives.

Then an animation on the use of the toolkit was developed firstly in English and then translated in all partners languages: this video was published on YouTube channel.

The last steps were:

- the organisation of pilot try-outs in each partners country;
- the realization of an abstract with the result of the piloting period;
- the creation of a paper brochure for promoting the entire toolkit.

Chapter 2. Scenarios as teaching methods

Enhancing the capacity of trainers who work with adults with intellectual disabilities is vital for ensuring the provision of high-quality, inclusive support that promotes independence, inclusion, and personal growth. This module aims to provide trainers with the necessary tools and resources to excel in their roles and make a positive difference in the lives of the individuals they serve by using possible scenarios as tools to achieve this.

- Trainers play a pivotal role in the lives of adults with intellectual disabilities, as they are responsible for facilitating their learning, promoting independence, and fostering personal growth. However, supporting individuals with intellectual disabilities requires specialised knowledge and understanding of their unique needs and challenges. Therefore, increasing the capacity of trainers is crucial for several reasons:
- Quality of Support: By enhancing their capacity, trainers can deliver higher quality support and instruction tailored to the diverse needs and abilities of adults with intellectual disabilities. They can employ evidence-based practices, such as differentiated instruction and positive behaviour support, to promote meaningful learning experiences and skill development.
- Promoting Inclusion: Trainers who are well-equipped with inclusive teaching strategies can create welcoming and supportive environments where individuals with intellectual disabilities feel valued, respected, and included. This fosters a sense of belonging and encourages active participation in educational and social activities.
- Maximizing Potential: With increased capacity, trainers can better recognize and nurture the strengths and talents of adults with intellectual disabilities. They can provide opportunities for individuals to explore their interests, develop new skills, and achieve their full potential, ultimately enhancing their quality of life and overall well-being.
- Addressing Challenges: Working with adults with intellectual disabilities can present various challenges, including communication barriers, behavioural issues, and individualized support needs. Trainers with enhanced capacity are better equipped to address these challenges effectively, using proactive strategies and adapting their approach to meet the unique needs of each individual.
- Professional Development: Continuous learning and skill development are essential for trainers to stay updated on best practices and emerging trends in the field of intellectual disabilities. Increasing their capacity through targeted training and support not only enhances their effectiveness as trainers but also contributes to their professional growth and job satisfaction.

Here are five scenarios that can be used as learning methods aimed at increasing the capacity of trainers working with adults with intellectual disabilities.

Interactive Workshops

Scenario: Organize a series of interactive workshops where trainers can learn about new teaching methodologies, communication techniques, and strategies tailored specifically for adults with intellectual disabilities. Incorporate hands-on activities, role-plays, and group discussions to enhance engagement and understanding. For example, trainers could practice using visual aids or modified instructional materials during these workshops.

Peer Learning Circles

Scenario: Establish peer learning circles where trainers can collaborate and share their experiences, challenges, and best practices in working with adults with intellectual disabilities. Encourage trainers to discuss case studies, brainstorm solutions to common issues, and provide feedback to one another. This peer-to-peer learning approach fosters a supportive environment for skill development and knowledge exchange.

Field Visits and Observations

Scenario: Arrange field visits to organisations or facilities that specialise in supporting adults with intellectual disabilities. During these visits, trainers can observe experienced professionals in action, learn about innovative programs and interventions, and gain insights into effective teaching techniques. Encourage trainers to take notes, ask questions, and reflect on how they can adapt what they've learned to their own practice.

Online Training Modules

Scenario: Develop a series of online training modules covering topics such as inclusive teaching practices, behaviour management strategies, and person-centred approaches. These modules can include instructional videos, interactive quizzes, and downloadable resources. Trainers can complete the modules at their own pace, allowing for flexibility in learning while still gaining valuable knowledge and skills.

Simulated Scenarios and Role-Playing

Scenario: Create simulated scenarios or role-playing exercises that mimic real-life situations trainers may encounter when working with adults with

intellectual disabilities. For example, trainers could practice de-escalating challenging behaviours, facilitating group activities, or providing individualized support. Incorporate feedback and coaching from experienced facilitators to help trainers refine their skills and build confidence in their abilities.

These scenarios offer diverse learning opportunities that cater to different learning styles and preferences, ultimately enhancing the capacity of trainers to effectively support adults with intellectual disabilities.

Through targeted learning experiences such as interactive workshops, peer learning circles, field visits, online training modules, and simulated scenarios, trainers have gained the knowledge and skills necessary to create inclusive learning environments, foster independence, and promote personal growth among individuals with intellectual disabilities.

By increasing the capacity of trainers, we are not only investing in the professional development of those who work tirelessly to support adults with intellectual disabilities but also enriching the lives of the individuals they serve. Trainers equipped with inclusive teaching practices, effective communication techniques, and person-centred approaches are better positioned to maximize the potential of adults with intellectual disabilities, helping them to thrive and achieve their goals.

As trainers continue to apply what they have learned in their daily practice, we anticipate seeing positive outcomes in the form of increased engagement, improved learning outcomes, and enhanced quality of life for adults with intellectual disabilities. Moreover, by fostering a culture of continuous learning and collaboration, we can ensure that trainers remain at the forefront of innovation and best practices in the field of intellectual disabilities support.

In essence, this module is not just a culmination of learning activities but a catalyst for positive change-a testament to our commitment to empowering trainers and enriching the lives of adults with intellectual disabilities.

Chapter 3.

The Mobile Game
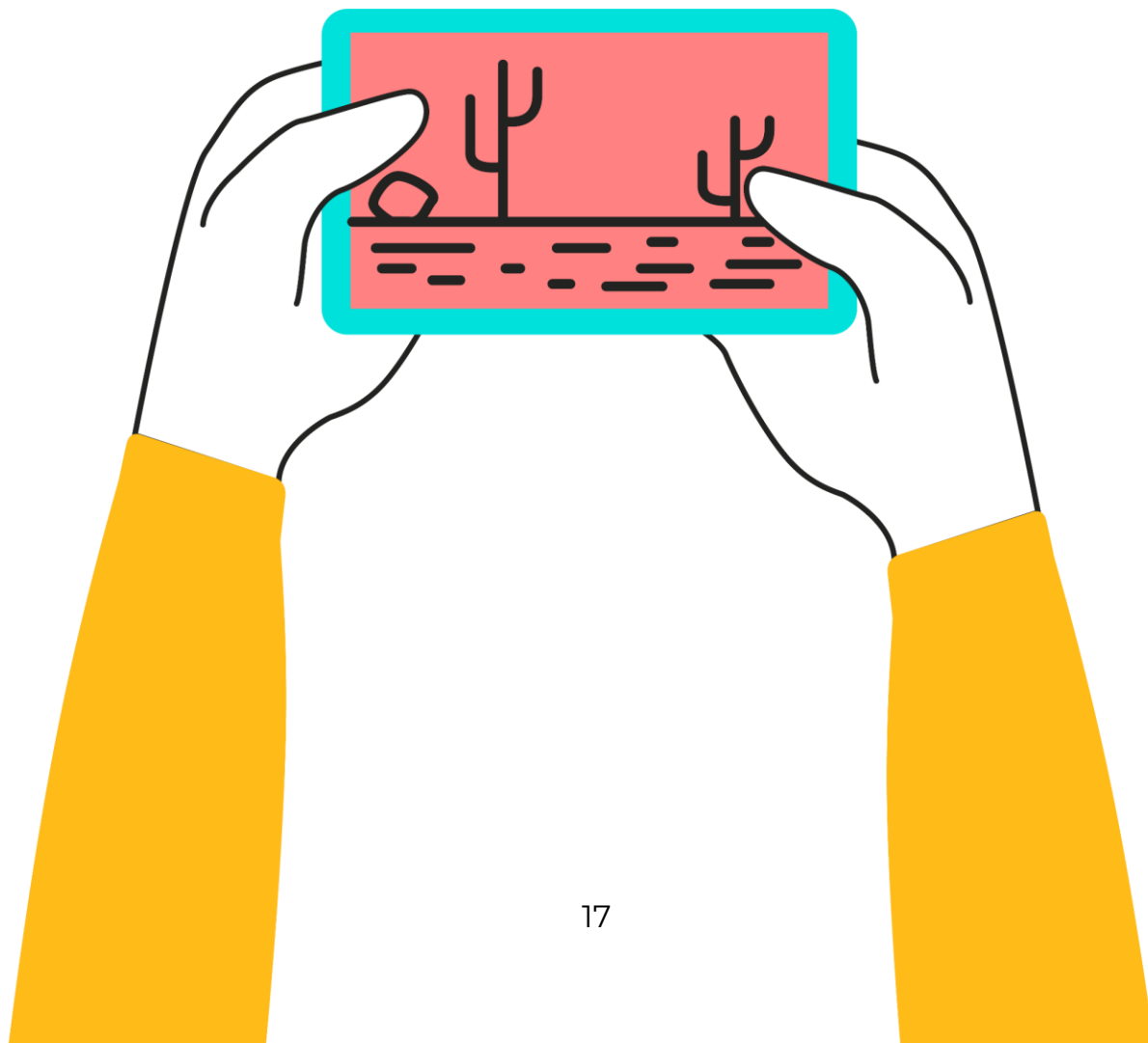
3.1 The e-game developed

The Game4CoSkills project has developed the creation of an e-game in 6 languages (French, English, Greek, Italian, German and Turkish) to stimulate cognitive skills development and concept teaching for adults with intellectual disabilities, to help them to enhancing cognitive abilities, increasing emotional regulation, managing chronic pain, and promoting their active participation as much as possible.

It aims to develop cognitive skills and the teaching of concepts for adults with intellectual disabilities and is structured to be used individually or in groups.

The game covers the development of multiple cognitive skills and teaching strategies, trying to allow adults with intellectual disabilities to learn while having fun.

3.2 Why an electronic game is important also for persons with disabilities

The electronic game developed in this project is important for adults with disabilities (as well as young people) to sharpen their cognitive skills because:

- stimulates their senses;
- can act as a distraction from pain and psychological trauma;
- help people suffering from mental disorders such as anxiety, depression, attention deficit hyperactivity disorder (ADHD) and post-traumatic stress disorder (PTSD);
- allows their social interaction.

This is also because it can create a space to relax your nerves, to relax and also favor breaks from the pressures of everyday life, just like a good read of a book or a walk in nature can do.

The most recent studies have also shown that the use of electronic games for people with intellectual disabilities can achieve important positive results, which translates into better attention, time management, life planning, decreased hyperactivity symptoms and better learning.

In essence, the electronic game ends up becoming a stimulant for the brain, allowing interconnectivity between various sectors and allowing parts of the brain to communicate with other parts of the brain and improve self-perception.

Using electronic games with small problem-solving activities is a great way to push the brain to perform mental exercises that stimulate brain cells, putting them in communication with each other.

3.3 How the e-game is structured

The game is structured in different sections and it is categorised in the following various 8 areas:

1. Colour
2. Memory
3. Math
4. Accuracy
5. Logic
6. Dexterity
7. Multitasking
8. Attention to details.
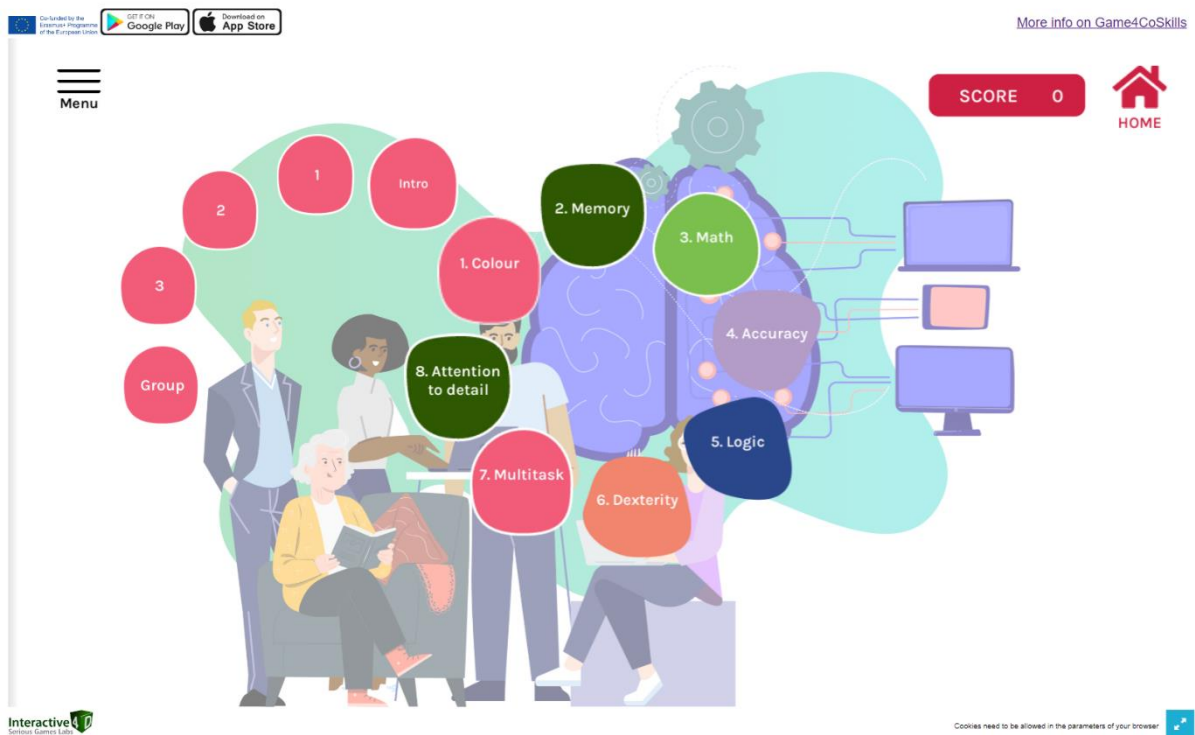
A. Each category of the mobile game indicated above contains a series of mini-games with an increasing difficulty;
B. was selected and developed for reaching the following teaching objectives:
   ○ Colour: to increase the ability to differentiate similar colours, sort the colours and all that in a fun way

- Memory: to entertain and challenge levels to boost short term/working memory; spatial memory; and visual memory.
- Math: to challenge levels to test and improve user's math skills.
- Accuracy: to help to increase accuracy and approximation
- Logic: to make the user's mind reflect.
- Dexterity: to perform a multitude of actions quickly, skilfully and effectively to be more agile, reflexive.
- Multitasking: to combine and use more than one skill at the same time and to make sure the user can be aware and pay attention to all details.
- Attention to detail: to permit the user more focused and to increase concentration, and make him/her more focused and attentive to detail.

The mobile games were developed for Android and Apple system and they were constructed to be played also on the web site directly:

- for who wants to use a **computer** (PC or MAC), it is possible to access the game at the following link: https://game4co.eu;
- for who wants to use a **smartphone** or **tablet**, it is necessary to download the game from:
  - Google Play at the following link: https://play.google.com/store/apps/details?id=com.Interactive4D.g4cs&pli=1
  - the App Store: https://apps.apple.com/fr/app/game4coskills/id6471690424

Of course, the Game4CoSkills game is free of charge.

Chapter 4.

Training needs

4.1 Introduction

The GAME4COSKILLS project takes an innovative approach to improving the cognitive abilities of adults with intellectual disabilities using mobile gaming. This chapter delves into the critical training requirements for trainers, providing them with the knowledge, skills, and understanding needed to navigate the complexities of this unique educational landscape.

4.1.1 The essence of cognitive skills training

The role of adult trainers who work with people who have cognitive disabilities extends beyond traditional teaching, into areas where they can have a significant impact on the lives of students. The essence of cognitive skills training lies in meeting a wide range of educational needs, including knowledge, skills, and attitudes. This triad serves as the foundation for an inclusive learning environment in which all learners are valued and supported. Effective training provides educators with the ability to tailor educational experiences to their students' diverse needs, improving their quality of life and fostering greater societal inclusion.

Having a thorough understanding of these disabilities is essential as it forms the basis for adjusting instructional strategies and materials to meet the individual needs of every student. This understanding extends beyond the classroom to include an understanding of the everyday obstacles faced by adults with cognitive disabilities. Trainers must acknowledge these obstacles in order to take an empathic stance and create educational experiences that are both highly relevant to the learners' daily lives and education.

Furthermore, the ability of the trainer to foster profound empathy and sensitivity is critical to the establishment of a supportive learning environment. This fundamental component of training makes sure that every student's potential and dignity are not only acknowledged but actively maintained in the learning environment. Trainers can create an environment where learning is impactful and meaningful by bridging the gap between the lived experiences of adults with cognitive disabilities and educational content through this multifaceted understanding and approach.

4.2 Understanding cognitive disabilities

The goal is to provide trainers with a thorough understanding of cognitive disabilities, including the wide range of conditions, their effects on learning and daily functioning, and the unique challenges they present. This fundamental understanding is required for empathetic engagement and the development of effective teaching strategies that address the diverse needs of adults with cognitive disabilities.

4.2.1 Types and characteristics

Cognitive disabilities are a group of conditions that cause cognitive limitations and influence adaptive behaviours. These conditions vary greatly in severity and impact on an individual's functioning:

- Mild cognitive disability: During the preschool years (ages 0-5), individuals frequently develop social and communication skills while experiencing minimal sensorimotor impairment. They can learn academic skills up to the sixth grade level and, as adults, can develop social and vocational skills sufficient for self-support.

- Moderate cognitive disability is characterised by noticeable developmental delays in childhood, particularly in speech and motor skills. Adults with moderate ID can complete simple tasks and participate in social and vocational training under moderate supervision.

- Severe cognitive disability: Individuals with severe and profound cognitive disabilities demonstrate significant developmental delays in all areas during infancy. They need close supervision and assistance with basic tasks and can benefit from systematic habit training.

4.2.2 Learning preferences and challenges

In educational settings intended for adults with cognitive disabilities, a wide range of learning preferences and challenges are frequently observed. Many of these adults are excellent visual learners, and they benefit greatly from using visual aids such as diagrams, pictures, and color-coded materials to grasp complex concepts. Simultaneously, tactile activities that require direct interaction can greatly improve their comprehension and participation, making abstract concepts more concrete. Routine structure and predictability, combined with clear and consistent instructions, are also important in reducing anxiety and improving comprehension.

However, these students may encounter difficulties with abstract thinking, memory retention, problem solving, and applying learned skills in new contexts. Addressing these challenges requires the implementation of specific strategies. Using concrete examples to illustrate abstract concepts, incorporating repetition to reinforce learning, using multisensory teaching methods to engage different senses, and breaking tasks down into smaller, manageable steps are all practices that can help to create a more inclusive and supportive learning environment. These methodologies not only address the unique needs of adults with cognitive disabilities, but also provide meaningful support for their educational progression.

4.3 Theoretical frameworks and application in training

Examining theoretical frameworks such as Vygotsky's sociocultural theory and Piaget's stages of cognitive development can greatly improve our understanding of the cognitive development of adults with cognitive disabilities. These theories highlight the significance of taking into account the developmental stage and sociocultural context of individuals with cognitive disabilities, and they provide insightful information about the learning and growth processes of such individuals.

4.3.1 Piaget's stages of cognitive development

The theory of Jean Piaget is fundamental to our knowledge of how people grow cognitively from childhood to adulthood. According to Piaget, there are four distinct stages of cognitive development, each with unique skills and modes of thought:

- **Sensorimotor stage** (birth to two years): Learning happens when a person physically interacts with their surroundings. Understanding this stage aids trainers in recognising the fundamental role that sensory experiences and motor activities play in learning, even though it is most relevant to infants.

- **Preoperational stage** (two to seven years): characterised by the emergence of language and symbolic thinking, but still constrained by egocentrism and trouble grasping abstract ideas. Activities that make use of real visual aids and straightforward language can be especially beneficial for adults with cognitive disabilities.

- **Concrete operational stage** (seven to eleven): during this stage logical reasoning skills and an understanding of concrete relationships are developed. Education based on practical, real-world examples and experiences is often beneficial for adults with cognitive disabilities.

- **Formal operational stage** (twelve years and up): Deductive reasoning and abstract thought start to appear. While structured problem-solving exercises and guided exploration of abstract concepts can aid in the development of abstract thinking, some adults with cognitive disabilities may find it difficult to think abstractly.

The central tenet of Piaget's theory is that active knowledge construction occurs as a result of interactions with the environment during cognitive development.

This idea can be put into practice by trainers by designing educational acti
vities that promote experimentation, exploration, and discovery.

4.3.2 The sociocultural theory of Vygotsky

The report's primary goals include providing evidence-based policy recommendations based on the data and findings of the Game4CoSkills project. These suggestions are based on real-world experiences and outcomes, ensuring their relevance and applicability. The report will emphasise the importance of mobile games in improving cognitive skills and will advocate for their inclusion in educational programmes designed for adults with intellectual disabilities. It also intends to provide strategies for integrating these innovative tools and methodologies into existing educational frameworks and training programmes, thereby increasing their effectiveness and reach.

Lev Vygotsky concentrated on the critical roles that cultural context and social interaction play in the development of cognition. Vygotsky suggested that learning is a social process and that cognitive development is primarily driven by engaging with more knowledgeable people (teachers, peers) within a cultural context. Piaget, on the other hand, focused on stages of development. Important ideas in Vygotsky's theory are as follows:

- **Zone of Proximal Development** (ZPD): Vygotsky defined the ZPD as the gap between an individual learner's capacity and what they can accomplish with the support and direction of an experienced partner. For instructors, this entails selecting assignments that students can complete with assistance and progressively raising the level of difficulty and autonomy as abilities advance.

- **Scaffolding**: This tactic entails giving students organised assistance while they complete tasks inside their Zone of Proximal Development. One way to effectively scaffold someone is to ask guiding questions, give examples, or divide tasks into smaller, more manageable steps. Support is gradually reduced as students advance in skill.

- **Mediation**: According to Vygotsky, cognitive development is mediated by symbols and tools (such as language, writing, and numbers) within a cultural context. For adults with cognitive disabilities, trainers can enhance the accessibility and significance of learning through the use of culturally appropriate materials and communication techniques.

Trainers are encouraged to establish a cooperative learning environment that uses social interactions and cultural resources to support learning by implementing Vygotsky's sociocultural theory. Trainers can enhance cognitive development through group activities, peer tutoring, and community-based projects, all of which emphasise the social aspect of learning.

4.3.3 Integrating theories into training

Trainers can create a thorough plan for teaching adults with cognitive disabilities by incorporating the insights from the theories of Piaget and Vygotsky. This entails designing learning opportunities that are socially and individually enriched to maximise the benefits of teamwork and cultural context, as well as individually tailored to fulfil developmental needs. A more fulfilling and powerful educational experience results from an approach that actively supports students' social and cognitive development while also honouring their capacity for cognitive processing.

4.4 Strategies, assessment, and ethical practices

Creating a productive learning environment is a critical step in the education of adults with cognitive disabilities. This calls for a multimodal strategy that combines creative assessment techniques, behavioural management expertise, and ethical behaviour management with the goal of creating an environment that supports learning, development, and empowerment.

4.4.1 Creating a positive environment and managing behaviour

The ability of educators to control a wide range of behaviours while upholding a positive learning environment that supports each participant's educational journey is fundamental to any successful educational endeavour. Beyond simple punishment, effective behavioural management entails identifying each learner's particular needs and triggers in order to create plans that anticipate disruptions and promote positive behaviours. A nurturing, encouraging, and supportive environment is the cornerstone of designing a positive learning environment. This encompasses the educator's emotional tone as well as the physical arrangement.

Strategies like constructive criticism, communicating expectations in a clear and consistent manner, and fostering an environment of mutual respect and understanding in the classroom are crucial. In addition to encouraging efficient learning, this kind of setting fosters social interaction and teamwork, two things that are crucial for adults with cognitive disabilities to advance in their education.

4.4.2 Assessment and evaluation

In tandem with behaviour management and cultivating a positive atmosphere, assessment and evaluation play a crucial role. Accurately measuring the progress of learners depends on the creation and application of efficient assessment instruments. These resources function as windows into each participant's unique learning journey, highlighting areas of strength and those in need of additional support, in addition to acting as benchmarks of achievement.

The process of using assessment data is dynamic and requires ongoing improvement of intervention and instructional strategies. This guarantees that instructional strategies adapt to meet the needs of students, creating a customised learning environment. Furthermore, by including feedback mechanisms in the assessment process, teachers are better equipped to modify their lesson plans and instructional techniques, keeping the curriculum flexible enough to meet the changing needs of their students.

4.4.3 Navigating ethical practices and professional development

Underpinning these efforts are the professional and ethical considerations that guide educators in their practice. Understanding the ethical dimensions of working with adults with cognitive disabilities is fundamental, guiding trainers to respect learners' rights, dignity, and aspirations towards independence. This ethical stance requires a commitment to continual professional development. Staying informed of best practices, emerging technologies, and innovative teaching methods is not merely an academic exercise but a professional imperative. It ensures that educators remain at the forefront of pedagogical innovation, equipped with the knowledge and skills to meet the diverse needs of their learners.

Such a commitment to professional growth and ethical practice underscores the educator's role not just as a teacher but as an advocate and ally in the learners' journey towards empowerment and self-reliance. A dedication to ethical practice and professional development like this highlights the educator's role as an ally and advocate for the learners' path to empowerment and self-reliance in addition to their role as a teacher.

To put it briefly, creating a productive learning environment for adults with cognitive disabilities necessitates a multifaceted strategy that combines behavioural control, individualised assessment techniques, and a strong dedication to moral behaviour and professional growth. This all-encompassing approach guarantees that the learning process is not only efficient but also courteous, accommodating, and empowering for all parties.

4.5 Conclusion

In conclusion, developing an educational programme that is supportive and enriching for adults with cognitive disabilities is a challenging but worthwhile endeavour. It pushes teachers to go beyond conventional teaching strategies and adopt a comprehensive strategy that includes adaptive assessment methods, behavioural management, and a strong commitment to moral behaviour. This method not only honours the individual needs and rights of students, but it also cultivates an atmosphere in which personal development, self-reliance, and empowerment are valued highly. Teachers can continue to hone their tactics and make sure that their instruction is still effective, responsive, and in line with the changing needs of students by keeping up to date on emerging technologies and best practices.

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Chapter 5.

Objectives

5.1 Introduction

It is essential to bear in mind that the IT industry is a significant tool to serve a beautiful and important goal, such as helping a group of people who cannot benefit from opportunities as much as the others. We can list uneducated children, people with diseases, and the physically and mentally challenged individuals. Games constitute a part of this industry, and they are starting to play a more active role in learning and teaching activities of all age groups, and individuals with cognitive disabilities are not an exception.

In education, mobile devices offer a variety of ways to learn, communicate and collaborate (Gikas & Grant, 2013). The use of this kind of technology has become necessary in the daily lives of all people, including people with disabilities. This way of teaching perceives digital games that include specially arranged sets of behaviours, also adds an individual touch which increase the effectiveness of the game. With the active usage of games, the students can be introduced with educational contents in a more suitable and understandable way. Hence, using games actively in the learning and teaching process can assist the individuals with intellectual disabilities to form a way of thinking, learn new data, acquire life skills, as well as learn and develop social and other skills.

5.2 Digital games for educational purposes

The most common terms used when describing digital games for educational purposes are educational games, *serious games*, gamification, and game-based learning (Stancin & Hoic-Bozic, 2020).

Educational games are built on software that utilises game technologies such as game playing and storytelling in order to generate educational content. In other words, educational games are mainly utilised as tools to practise information in education.

Serious games, including elements from the video game field, possess the purposes beyond entertainment such as education. In the field of education, serious games should be constructed with well-defined learning outcomes in addition to generating positive impact on developing new skills or acquiring knowledge. It is the credit of pedagogy that makes games serious, but the instructional content must be well incorporated within the game characteristics which enables students to have fun and forget about the learning part of the game. We can simply describe it as "games that do not have entertainment, enjoyment or fun as their primary purpose".

Gamification signifies the use of game elements to ensure the constant engagement of the participants and increase their motivations to take part in the situations that are not games.

And game-based learning is a learning process which employs digital games so that certain learning outcomes can be reached.

Starting from the fact that intellectual disability is not an illness or a psychiatric disorder, but a state of insufficient development of the central nervous system during the early development of an individual, possible development can be stimulated, and digital games can play a remarkable role in it.

Individuals with intellectual disabilities usually have difficulties in "cognitive, motor, auditory, language and psychosocial functioning" (Stancin & Hoic-Bozic, 2020). Deficits in adaptive skills are in conceptual (language, money, time concepts), social (inter and intrapersonal skills, judgement, social problem solving), and practical adaptive skills (self-care, activities of daily living, occupation) (Maulik et al., 2011). Moreover, people with cognitive disabilities experience difficulties concerning attention, memory, reasoning, language, perception, problem-solving, conceptualising, self-regulation and social development. These difficulties hinder their proper knowledge acquisition and competence development. Hence, they have major difficulty in relating and learning concepts and behaviours.

Generally, people who suffer from cognitive disabilities experience high levels of digital exclusion. Several reasons can be listed for their digital exclusion, one of the reasons that stand out is accessibility. Another issue is the design, content and mechanics of the games. These educational games should display a pedagogical approach which focuses on learning outcomes determined by a game and how these outcomes will be practised via game mechanics. Considering the elements above, digital games with the purpose of education endorse inclusion and empower people with cognitive disabilities.

Fully inclusive education is a necessity, and involvement of innovative didactic methods could be helpful in achieving that objective. Use of serious games is a powerful instrument to foster the learning of people with disabilities, hence a big step towards inclusive education.

5.3 Serious Games

The development of serious games for mobile devices is experiencing an increase and displays positive results. This effect is due to the fact that

mobile devices have advantages over static equipment and computers (GameLearn, 2015). Mobile games can be included under the framework of "serious games" as long as the primary objective is learning rather than entertainment. However, it does not mean that it is not enjoyable. It provides entertainment as other games, yet the primary purpose is always learning and education. A serious game involves one or more players. Furthermore, it involves rules, specific goals, and ways to achieve these goals through moves or actions (Caillois, 1961; Dempsey, Haynes, Lucassen, & Casey, 2002). Driving force behind the serious games is educational objectives in various domains along with encouraging attitude and behaviour change, such as discouraging smoking or encouraging recycling.

These educational games under the name of "serious games" are usually developed by experts in the field for one target group in particular through taking their needs into account so that effective learning can be enabled. The integration of concrete learning objectives and the consideration of media-didactic models are of great importance in the development of Serious Games (Breitlauch, 2012).

During the development phase, the needs of the target group should be taken into consideration. Numerous serious games have been developed to support people with disabilities. This suggests that they have a great learning potential for people with disabilities, hence it can enrich inclusive education.

Recent studies show that serious games have been used for different objectives in schools all over the world: to raise learning motivation and also to foster students' language and mathematical skills, to help students learn about history, ethics or science (Wastiau, Kearney, & Van den Berghe, 2009; Vu & Feinstein, 2007), to reduce school phobia (Wastiau et al., 2009), or to sensitize students to dangers on the Internet (Iten & Petko, 2016). The potential of Serious Games is also constantly exploited in professional training (Pourabdollahian, Taisch, & Kerga, 2012; Cain & Piascik, 2015; Le Compte, Elizondo, & Watson, 2015; Wilson, Calongne, & Henderson, 2015), especially in commercially oriented companies (Dicheva, Dichev, Agre, & Angelova, 2015). Research also shows that certain Serious Games are used for both addiction and disease prevention (Willmott, Taylor, Russell-Bennett, & Drennan, 2019; Winksell, Sabben, Akelo, Ondeng'e, Odero, & Mudhune, 2019).

Furthermore, teachers need diverse content and mechanisms to avoid repetitiveness and keep the learners engaged. In that regard, serious games can enable teachers to increase effectiveness of teaching and learning through offering differentiated learning methods.

Learning content can be transferred to the beneficiaries in a playful way through serious games. Utilising playful challenges produces higher learning motivation in the learners. To this end, some requirements must be met: first of all, as a most important element, the game should be fun. Hence, appealing mode of play in accordance with the target group is a

requirement. Second, the adaptation of the game needs should be convenient for both explicit needs and the abilities of the target group (e.g. cognitive disabilities). Third, it should be ensured that the learners are aware that the objective of the game is not only entertainment, but also and mainly learning.

Despite there is no consensus on utilisation of serious games leading to increased learning motivation, they possess the potential to assist in the acquisition of certain types of expertise or skills. For example, Serious Games have been successfully integrated in educational settings to improve mathematics skills such as analysing statistics (Wronowski et al., 2020). Moreover, serious games have been used for language learning, such as effective vocabulary learning.

In addition to being integrated into an educational context to foster the acquisition of specific expertise, serious games can also help students individually, e.g., by reducing individual barriers. For example, learning with Serious Games has helped young learners who suffered from didaskaleinophobia (fear of going to school) to collaborate with other students as part of a group (Wastiau et al., 2009). Furthermore, they have also been used to support students with poor organisation skills and lack of discipline to develop leadership skills (Wastiau et al., 2009). This is a strong indicator of possible utilisation of serious games with people with cognitive disabilities when the necessary preparations are monitored throughout the development phase. The game can help them strengthen the skills they lack such as colour and object distinction, simple mathematical operations or memory.

5.4 Conclusion

Consequently, Serious Games stands out as a remarkable alternative to conventional teaching methods, which often do not apply because cognitively challenged learners lose interest rather quickly, and they have a positive impact on learning. Serious Games can be used in formal or non-formal learning to foster learners' acquisition of expertise, fill in the skill gaps, overcome learning difficulties, increase their motivation to learn. The present systematic literature review explores the potential of Serious Games to foster learning for a specific group of learners; namely, children and adolescents with disabilities (Keller, Döring, & Makarova, 2021).

Lämsä, Hämäläinen, Aro, Koskimaa, and Äyrämö (2018), the potential of Serious Games for people with learning disabilities was discussed. The authors reached the conclusion that certain Serious Games effectively support people with learning disabilities in the acquisition of language and mathematics skills. Additionally, Tsikinas and Xinogalos (2019) turned their

attention to people with intellectual disabilities or autism spectrum disorders. They observed an improvement of social, communication, and cognitive skills through playing Serious Games. Finally, in the third review Stančin, Hoić-Božić, and Skočić-Mihić (2020) found that Serious Games can have a positive impact on children and adolescents with intellectual learning disabilities in the field of mathematics.

Serious Games are capable of assisting the children and adolescents with disabilities in learning process and outcomes. First of all, serious games are powerful tools for improving the conditions and behaviours which are helpful during the learning process, such as increasing attentional capacity or focusing ability. Secondly, these games play an important role in enhancing learning motivation, self-efficacy, self-confidence, enjoyment in learning, enthusiasm, calmness and engagement, and also improve short-term, visual memory performance. Third, they are useful for improving the recognition and understanding of facial expressions and increase players' collaboration and social interaction skills. Last but not least, Serious games can efficiently support the attainment of content knowledge and subject-related skills in mathematics such as basic arithmetic, number comparison, and more generally in the field of STEM. Same can be said for language learning such as verbal ability, reading, spelling, vocabulary, or phonological awareness. Overall, Serious Games are feasible tools for improving learning conditions, learning-related behaviours and outcomes among learners with special educational needs.

It can be stated that in light of the UN Convention on the Rights of Persons with Disabilities (CRPD), in which all signatory states guarantee equal educational opportunities for people with disabilities, Serious Games have a promising potential and can be used to promote inclusive education in schools (Keller, Döring, & Makarova, 2021). Serious Games might introduce remarkable opportunities to enable collaborative, barrier-free, and effective learning. On the other hand, in order to ensure the effective implementation of Serious Games in the inclusive educational setting, a proper IT-infrastructure as well as teachers' ICT-competence and willingness to use them is required.

Mobile games in general, under the structure of serious games, possess a promising potential for children and adolescents with cognitive or physical disabilities. Despite the potential there is, this field is still new. However, in the near future, as the digitalization of education advances, a number of games will be created focusing on different target groups and different disabilities.

Resources

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Chapter 6. Instructional methods

6.1 Introduction

The instructional methods are designed for the guidance and explanation of the mini-games. The trainers can understand how to administer the new mobile game to adults with Intellectual disabilities (ID) which guide them to follow the instructions and the suitable methodologies which are used in every mini-game. The training of each cognitive skill needs a different methodology and structure to be efficient. All mini-games use educational methods for the improvement of every cognitive skill. At the beginning of every category-cognitive skill, there is an introduction that explains which cognitive skills are based on the following games. Additionally, the instructions are written and simultaneously are given audio recordings. This is the best way to be fully comprehensive of the instructions, for the adults to feel comfortable and start the game with self-confidence. Any questions or misunderstandings can be explained by the trainers. Suggested methods for extra practice are given.

6.2 Colour

The first mini-games of the Game4CoSkills are designed based on the cognitive skill of color. The tasks of this category use the visual recognition method since the aim of the games is colour recognition. Shaping also plays a crucial role in these tasks, while the color which must be selected can be found in a different shape. Moreover, numbers are hidden in coloured boxes with dots, and only by following the dots are recognized the numbers. This is the most difficult task of the mini-games of color as a cognitive skill.

The tasks increase their difficulty as the player plays the game. Giving the player the time to interact with the game and choose the best answer according to his/her perception will increase the self-esteem of the player.

Suggested method for extra practice

Give the player paper to paint. Ask for them to start with the light colors and finish the drawing with the darkest colors. This method practices color recognition and the perception of colors.

6.3 Memory

This mini-game demands the player to stay focused on the tasks. Explain to the player that time is given and no stress should be present. The method of visual recognition and short-term memory skills are used in these tasks. The player has to remember a sequence of numbers with the correct order.

Memorizing a colored map with items (locations) is the second task which contains various information. The trainers must give time to the players to memorize the picture, feel sure of their skills, and then continue with the game. Story telling method is the last task of the cognitive skill of memory. This method includes reading, comprehension, and perception. The questions after the reading of the story, will be answered only if these three cognitive skills are used at the same time to maintain the skill of memory.

Suggested method for extra practice

Trainer can suggest extra practice to the player. Acoustic memory and perception could be a perfect exercise by using the acoustic method. The trainer can say ten words and the player should repeat them. Another method that can be used, is the method of memory visualization. Visualization involves using visual cues to encode, store, and recall information. During this practice, the player is given ten written words and has to remember them. The response could be orally or in written words.

6.4 Math

Practicing math is a demanding issue. Math which is included in the mini-games is referred to as the method of equations. This is the first task since it is the easiest part of the mini-games of math. The introduction of the game of math explains to the player which skill the game focuses on. Let the player take time to think and feel comfortable. The other task of the game uses the method of several sequences of numbers. This task is more demanding and needs math skills.

Suggested method for extra practice

For extra practice, you can use visual methods. For example, use illustrated math problems that motivate the students to use visual methods on their own, such as drawing, during the problem-solving.

6.5 Accuracy

The games of accuracy are using visual and coding methods. In the first games, the player has to complete the tasks of scrambled words. Under the scrambled words, the correct words with their images. This combination helps the player to recognize and code the scrambled letter and find out which word is hidden. The following games also use the same methods and the scrambled words are given, but the length of the words is longer and it increases the difficulty. It is up to the player to put the letters back and create the word which is hidden.

Suggested method for extra practice

More practice in accuracy skills can be done by using visual methods. During this process, students can receive a small text which includes phrases. Every phrase is missing a word. They have only the first letter of each word and based on the meaning of the phrase and the text they have to find out which word is missing.

6.6 Logic

In the mini-games of logic, the used method is the inductive reasoning method. By using this method the players have to think logically and to find out a solution or a result. Thus, the first game which uses the inductive method includes a problem that must be solved. It is suggested to solve this problem as a team and time the participants' response time. In this way, the activity will be more challenging and will increase the fun of the game. The next game uses the method of enigma. The players have to make combinations and find out the solution. It is also suggested to participate as a team.

Suggested method for extra practice

For extra practice it is suggested to use mathematical logic methods. By using colorful mathematical symbols to prove theoretical arguments the students have the time to think, practice also the math skills and prove an argument.

6.6.1 Dextery

One of the most enjoyable tasks of the game is one of the dexterity skills. For this cognitive skill, the methods that are used are based on the combination and visual methods. Thus, the first games ask the players to link items together as quickly as possible. The difficulty is increasing and it makes the game more challenging. The next game includes puzzles and that is why the visual recognition method is used. The difficulty also is increasing and the challenge as well.

Suggested method for extra practice

For extra practice, you can use the method of sequence. The colorful sequencing cards will give motivation to the student to focus and find which card is at the beginning and which one is at the end. Thus, one story will be created and they have to narrate it.

6.7 Multitasking

In the task of multitasking, the relation method. In the games, the players have to read a story and complete it with the given words, the word which is missing in every gap. During this process, they have the time to think and decide which word is correct based on the meaning of the phrase. The relation between phrases is important and the players have to stay focused and efficient.

Suggested method for extra practice

For extra practice, you can motivate the students to use drawing methods. They can see a colourful picture and have the time and the motivation to draw the same picture on their own. It will increase their skills, and make them feel more productive no matter the talent they have.
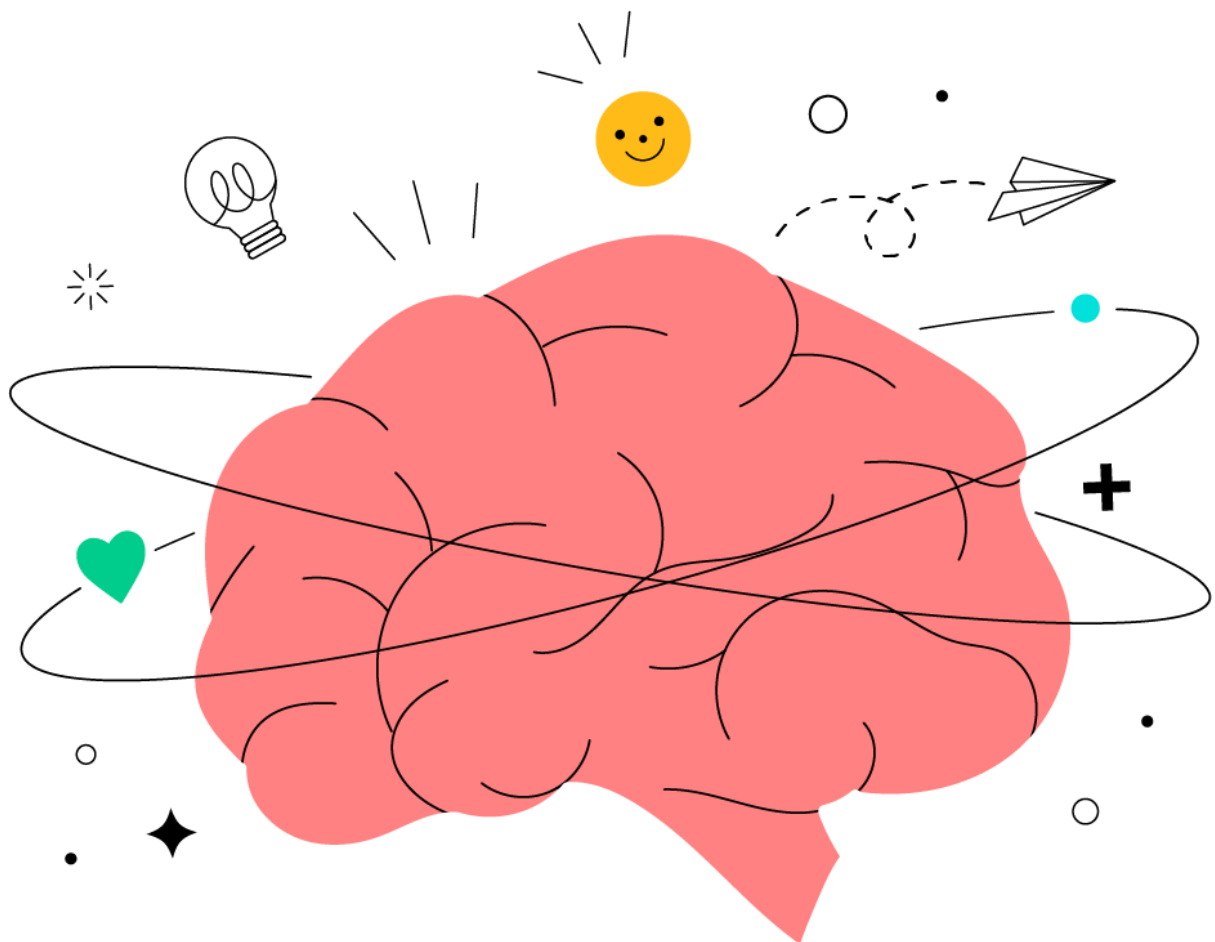
6.8 Attention to detail

Attention to detail mini-games include activities that are based on the memorization method. According to this method, it is necessary for the player to be focused and memorize the details which are provided. The colorful images with a lot of information are suitable for the goal of the games. The players have the time to notice the details and then some questions need to be responded to. The final game of this task uses similar images which must be crossed.

Suggested method for extra practice

One suggestion for extra practice of attention to detail skill is that the trainers can use two same colorful pictures and ask the students to find which the 5 differences between them are. This activity is based on the visualization method.

Chapter 7.

Case study

NeuroNation

Where the case study was developed (location, country)	**Berlin, Germany**
Organization that developed the good practice	**Synaptikon GmbH in cooperation with Queen's University, ECU - East Carolina Universit, yMSH** - Medical School Hamburg and Charité Berlin
Aims and objectives of the entity responsible for the good practice	NeuroNation aims to provide personalized brain training programs to individuals seeking to improve their cognitive abilities. The objectives of NeuroNation include developing scientifically backed games and exercises targeting various cognitive functions such as memory, attention, problem-solving, and reasoning. The project wants to offer a platform accessible to a wide range of users, including those with cognitive impairments, to improve their mental abilities. The project team is conducting research to validate the efficacy of their programs and contribute to the field of cognitive training.
Case description	NeuroNation is an online platform and mobile app that offers a variety of brain training exercises and games. Users can create personalized training plans based on their cognitive strengths and weaknesses. The platform tracks users' progress and adjusts the difficulty of exercises accordingly. It offers a range of exercises targeting different cognitive domains, such as memory, attention, and executive functions. NeuroNation's approach combines elements of gamification with evidence-based cognitive training techniques.
Period of development	NeuroNation was founded in 2011. Since its inception, NeuroNation has continuously evolved its platform, adding new features, improving existing exercises, and expanding its user base. The platform has undergone iterative development based on user feedback and scientific research findings in the field of cognitive training.
Results obtained	Since its inception, NeuroNation has gathered significant recognition. With its innovative approach to brain training, NeuroNation has attracted millions of users globally, showcasing a remarkable level of interest and engagement in its programs. The platform has received positive feedback from users who report subjective enhancements in cognitive abilities such as memory, attention, and problem-solving through regular use. NeuroNation's commitment to scientific validation has led to collaborations with reputable researchers and institutions. NeuroNation's contributions to the field of brain training and digital health have been acknowledged through accolades and awards.
Reference link	https://www.neuronation.com/?lang=de

The Sign Language Avatar Project (SiMAX) & SiGAME Game

Where the case study was developed (location, country)	**Austria**
Organization that developed the good practice	**signtime GmbH**
Aims and objectives of the entity responsible for the good practice	The project developers describe their project in the following way: The language barrier faced by the deaf community has long been a challenge. Existing sign language translation methods are often inadequate as they cannot capture the complex facial expressions that are important for understanding. The EU-funded SiMAX project aims to break new ground with a 'translation engine' that combines sign language skills with advanced ICT tools. The overarching goal is to revolutionize accessibility for the deaf community. Using intelligent algorithms and a 'learning' database, human translators can fine-tune the translations suggested by the system via SiMAX technology. The result is a lifelike avatar that delivers accurate sign language interpretation. The commercial potential of the SiMAX system is immense. Digital content, television and film will be more inclusive than ever before. The project was also partly funded by the European Union. As part of the project the developers also launched a mobile game called SiGame. The SiGame app is a fun way to learn and practise sign language. In addition to a dictionary, the app also includes a quiz, a memory game and a vocabulary trainer. The SiMAX avatar assists the user with all functions. The fictional character signs the words and is also the game partner. The avatar realistically portrays the facial expressions of the gestures using an emotion control system specially developed for the app. The SiMAX avatar was awarded the Innovation Prize of the Vienna Chamber of Commerce in the Creativity & Media category in 2013.
Case description	SiMAX is a semi-automatic system designed to translate text into sign language by combining technology from animation pictures, the gaming industry, and computer-aided translation services. As a fully automatic translation is not possible, the translation process is managed by a professional, deaf person.
Period of development	launched summer 2015
Results obtained	SiMAX is a semi-automatic system designed to translate text into sign language by combining technology from animation pictures, the computer gaming industry, and computer-aided translation services. As a fully automatic translation is not

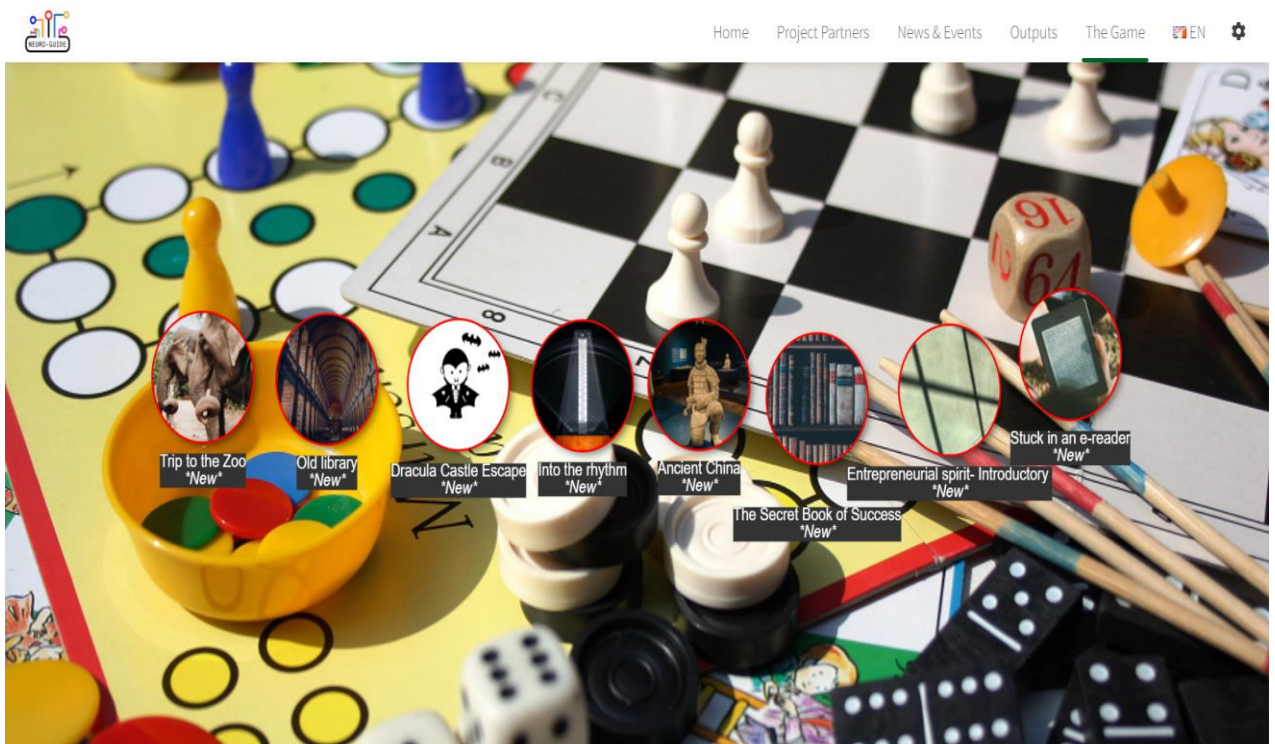|	possible, the translation process is managed by a deaf person who is preferably a qualified interpreter or has an excellent command of sign language. As such, this system also creates high-quality jobs for deaf people. The translation process is conducted by a person who is knowledgeable in sign language, which includes people with a hearing impairment, and as such, this system also creates high-quality jobs for this group. Because a fully automatic translation is not possible, there is a need for a human interpreter. However, there are exceptions, such as the standardized texts that are used for service announcements on public transportation systems. SiMAX can be used for translating these announcements in public areas, including security alerts. The system follows the natural grammar principles while developing the sign language avatar. Mimic has a grammar function in sign language (e.g., raised eyebrows symbolize an interrogative sentence), which the avatar is capable of displaying. The figure shows emotion and can move its head and upper body fluently. The avatar is exchangeable according to the target group e. g. for a children's broadcast the avatar has the appearance of a child. A "learning machine" is integrated into the system, which saves all previously performed translations and keeps them ready as proposals for future translations.
Reference link	https://zeroproject.org/ https://zeroproject.org/view/project/ba4a0f3a-5623-eb11-a813-0022489b3a6d https://cordis.europa.eu/project/id/778421/de https://www.verlagederzukunft.de/app-vorstellung-sigame/

Neuro-Guide

Where the case study was developed (location, country)	**Czech Republic, England, Portugal, Cyprus, Poland, Finland, Romania, Ireland**
Organization that developed the good practice	**Reintegra, Vita Education, Municipality of Lousada, Ośrodek Szkoleniowo-badawczy Inneo, Hub Karelia Oy, The University of Piteşti, Future In Perspective, SYNTHESIS Center for Research and Education Ltd**
Aims and objectives of the entity responsible for the good practice	NEURO-GUIDE had the following goals and objectives: 1. **Encourage** the development of creative and critical thinking skills: NEURO-GUIDE aimed to promote participants' creative and critical thinking skills. This was accomplished by creating alternative pedagogical resources based on constructivist learning theory. 2. **Improve** young adults' digital competence: The project aimed to improve young adults' digital competence by providing them with tailored learning resources. Recognising the shift from technology access to competence, NEURO-GUIDE sought to provide participants with the knowledge, skills, and attitudes required for active participation in the digital domain. 3. **Instill** an entrepreneurial spirit in young Europeans: NEURO-GUIDE aimed to instill an entrepreneurial spirit in young Europeans by ensuring they had the skills to research, select, analyse, organise, and present information. This goal aimed to equip participants with valuable skills applicable to today's job market. 4. **Promote** Europe's rich cultural heritage: The entity's goal was to promote Europe's rich cultural heritage by implementing escape room challenges. These challenges were created to address cultural heritage-related topics, thereby contributing to the preservation and celebration of Europe's cultural diversity. 5. **Support** front-line tutors in utilising mobile learning environments: The goal of NEURO-GUIDE was to assist front-line tutors in maximising the potential of mobile learning environments. The goal was to assist these tutors in developing high-value skill sets within their underserved target populations, thereby contributing to a more inclusive and effective educational approach. 6. **Reducing** youth unemployment and re-engaging marginalised youth: NEURO-GUIDE developed an innovative methodology in response to the challenges posed by youth unemployment, particularly among NEETs (Not in Education, Employment, or Training). The project aimed to re-engage marginalised young people and assist them in developing high-value transversal skills required

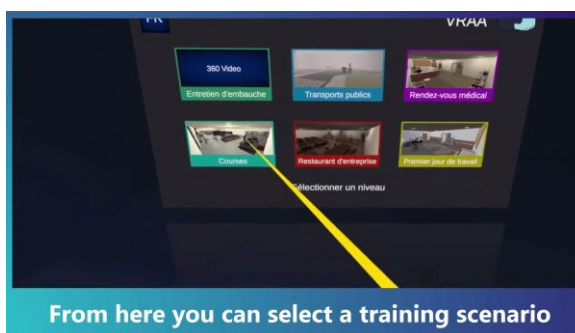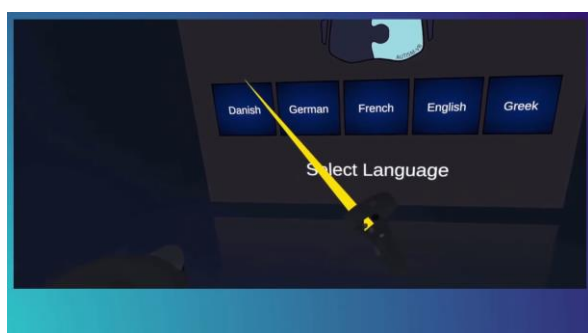|	
	for employment, thereby addressing Europe's persistent youth unemployment problem.
Case description	NEURO-GUIDE aimed to bridge the technological divide for marginalised young people from low socioeconomic backgrounds, with disabilities, or living in remote areas. The initiative focused on using online escape room challenges to foster creative and critical thinking skills, as well as skills in researching, selecting, analysing, organising, and presenting information. NEURO-GUIDE successfully implemented a strategy to empower disadvantaged students by addressing changing technological demands. Through online escape room challenges, the project created a platform for participants to actively engage and improve their problem-solving and critical thinking skills. NEURO-GUIDE went beyond simply providing access to technology by focusing on digital competence. The project was successful in providing young adults with the knowledge, skills, and attitudes required for active participation in the digital domain. This method recognised the significance of competence in navigating the rapidly changing technological landscape. The project was effective in re-engaging marginalised young people and assisting them in developing high-value transversal skills required for employment. This initiative aimed to address Europe's persistent problem of youth unemployment. The initiative met its objectives, contributing to participants' holistic development and addressing educational and employment-related challenges in the European context.
Period of development	September 2018 to October 2020
Results obtained	1. Online Escape Rooms: Through the project, an innovative learning resource in the form of online escape room challenges was successfully created. These challenges emphasised critical and creative thinking, as well as entrepreneurial spirit, while integrating digital competence and cultural awareness. To accommodate diverse learner backgrounds, resources were meticulously designed for four skill levels: introductory, intermediate, advanced, and expert. This method ensured accessibility and sustainability by allowing learners to progress through different levels and gradually build their skills. 2. In-service Training Programme: A customised in-service training programme and handbook were created to assist VET (Vocational Education and Training) tutors in using the NEURO-GUIDE online educational escape room resources and platform. The training programme focused on teaching tutors how to foster key creative and critical thinking skills, as well as entrepreneurial traits that are highly valued in the European labour market. The emphasis was on adapting to new dynamic, online learning environments, as well as investigating the roles of VET professionals in these settings. The training also covered the incorporation of multimedia and interactive

	resources, such as smart phones, mobile devices, and social media platforms. The programme was critical in ensuring VET providers' comfort, awareness, and buy-in regarding the benefits and risks of online learning. 3. Online Learning Portal: Hub for Online Learning Karelia was instrumental in the creation of an online learning portal that served as a centralised hub for gaining access to the entire suite of online educational escape room learning resources. The portal provided immediate access to a variety of courseware, as well as a learner tracking mechanism for front-line educators to track learner progress. It not only aided in the delivery of the in-service training programme, but it also included standard social media features, recognising the importance of such elements in modern online learning environments.
Reference link	https://www.neuroguide.eu/en/home/

VR Autism - Social Inclusion of People With Autism Spectrum Syndrome Through Virtual Reality

Where the case study was developed (location, country)	**Denmark, UK, France, Cyprus, Germany**
Organization that developed the good practice	**VIFIN, The London Borough of Hammersmith and Fulham, Pistes Solidaires, SYNTHESIS Center for Research and Education, Wisamar**
Aims and objectives of the entity responsible for the good practice	The "Social Inclusion of People with Autism Spectrum Disorder Through Virtual Reality" project, also known as VR Autism, was established to address the social inclusion and employment challenges that people with Autism Spectrum Disorder (ASD) face. Objectives and aims: 1. **VR Tool Development**: A set of VR tools was created to simulate everyday situations, assisting in the training and enhancement of social skills in adults with ASD. These tools provided a safe environment in which users could practise and improve their ability to navigate common social situations. 2. **Inclusive Development Process**: Individuals with ASD actively contributed to the development of the VR toolkit. Their participation ensured that the tools were specifically tailored to the target users' unique needs and experiences, enhancing the overall effectiveness of the training. 3. **Creation of a Handbook for Employers**: A comprehensive Handbook was created to help potential employers understand the needs of people with ASD. This resource provided valuable insights and recommendations, promoting a better understanding of individuals with ASD's abilities and facilitating a more inclusive work environment. 4. **Showcasing Good Practices**: The project successfully demonstrated best practices in the field of social inclusion for people with autism. Through the use of virtual reality (VR) tools, a collaborative partnership of organisations with expertise in digital-based technologies, social integration, labour market integration, and special educational needs demonstrated effective strategies for rehabilitation and training in communication and social skills.
Case description	The "VR Autism - Social Inclusion of People with Autism Spectrum Disorder Through Virtual Reality" project addressed the challenges of social inclusion and employment for autistic individuals. Recognising people with Autism Spectrum Disorder (ASD) face persistent difficulties in social communication and interaction, the project aimed to improve their social skills and employability.

	Individuals with ASD were involved in the co-development of a Virtual Reality (VR) toolkit, which was novel. This all-inclusive approach ensured that the VR scenarios, which were designed to simulate everyday situations like tram rides, job interviews, and lunch breaks, were created by those who would benefit the most from them. To inform these developments, the project conducted a needs analysis based on interviews with individuals with ASD, their relatives, and professionals working in the field. The findings influenced the design of virtual reality environments, ensuring that they addressed the unique challenges that people with ASD face. Key players, including those in advisory, support, and therapy roles, were trained to assist people with ASD in effectively using VR tools. The goal of the project was to empower people with ASD and make it easier for them to integrate into daily and work-related situations. Finally, the completion of the VR Autism project contributed to addressing the complex issues surrounding social inclusion and employment for individuals with ASD. The project aimed to foster understanding, inclusivity, and improved opportunities for people on the autism spectrum by using an inclusive development approach and innovative VR tools.
Period of development	September 2019 to January 2022
Results obtained	The project has created innovative VR-learning scenarios that can be used for ASD rehabilitation and training to improve social and employment skills. The project also developed guidelines for potential employers of people with ASD. Although there have been challenges, primarily related to the pandemic, the initial project activities and objectives have been carried out and met. 1. 10 different VR scenarios for the target group to practice and test their skills (10 learning modules) - A platform for the developed scenarios and learning materials 2. A user's handbook 3. An evaluation Report 4. A dissemination report 5. A manual for employment of people with ASD and related good practices 6. Local training events
Reference link	https://autism-vr.eu/

Select Language

From here you can select a training scenario

Bridge

Where the case study was developed (location, country)	**Greece** and also in **Italy** and **Romania** (partners of the project)
Organization that developed the good practice	**Panhellenic Federation of Alzheimer Disease, Challedu, University of Western Macedonia, Anziani e non solo, Asociatia Habilitas**
Aims and objectives of the entity responsible for the good practice	Prepare a European Innovative Intergenerational Approach Using Serious Games for People with Dementia
Case description	Intergenerational activities can be an enjoyable way to act on dementia symptoms, enable people with dementia (PwD) social inclusion and bridge the intergenerational (involving also younger and older people) gap through the direct involvement of young people. The Erasmus+ "Bridge" project has developed eight prototypes Serious Games (SGs) (physical, digital or phygital) and innovative Co-Creation Intergenerational Workshops acting on cognitive and behavioral symptoms of dementia between 2018 to 2021. Partners Greece (Panhellenic Federation of Alzheimer Disease), Italy (Anziani e non solo) and Romania (Asociatia Habilitas) have drafted the methodology of co-creation workshops and implemented them following the guidelines set. The final eight games have been developed and a second implementation of Game playtesting Workshops was organized in each country in order to assess the impact of the games. In total, 24 PwD co-designed and played some games with the cooperation of 6 game designers, 16 healthcare professionals, 7 caregivers and 21 young volunteers in the first Co-Creation Workshops. Eleven prototypes games had been created and the team of the project took the final decision to develop fully 8 of them. More specifically, the 8 "Bridge" games developed are the: Next destination; Flea market; Find the word; Bird-watching; Emotions; The directors; Blooming flowers; Specialite and can be found here https://projectbridge.eu/the-serious-game/ These have been tested during a series of workshops in October 2020, organized in partner countries. The testing phase involved 47 people: 23 PwD, 17 health professionals, 4 caregivers and 3 young volunteers. Moreover, during the project's lifetime, the Bridge web platform (https://projectbridge.eu/), contains MOOCs on the methodology of the Game-Creation Workshops and the final 8 selected SGs. The course is divided into different lessons that cover a variety of topics: ● Lesson 1: Introduction to Bridge training course and e-platform. ● Lesson 2: Description of Bridge Project, information on dementia and how to interact with ● people with dementia. ● Lesson 3: The co-creation workshops, information on the workshops held within the project.

	- Lesson 4: Introduction to serious games, how serious games benefit people with dementia - and the methodology used to create serious games addressed to people with dementia. - Lesson 5: Serious games developed within the project. For each game, users will find a detailed description, a rulebook, a video-tutorial, and all the materials needed to play. - Lesson 6: Training course summary. At the end of the course, which is available for free after registration, users will have the chance to get a certificate of attendance. The course has been developed in English, Greek, Italian and Romanian. Follow the link to access the training course: http://bridgecourses.uowm.gr
Period of development	between September 2018 to August 2021
Results obtained	1. An innovative intergenerational approach for co-creating serious games. 2. Eight prototype games had been created. More specifically, the 8 "Bridge" games developed are the: 3. Next destination; Flea market; Find the word; Bird-watching; Emotions; The directors; Blooming flowers; Specialite and can be found here https://projectbridge.eu/the-serious-game/ 4. A training course on the innovative intergenerational approach for co-creating serious games. The course has been developed in English, Greek, Italian and Romanian. Follow the link to access the training course: http://bridgecourses.uowm.gr
Reference link	https://projectbridge.eu http://bridgecourses.uowm.gr https://www.scirp.org/journal/paperinformation?paperid=112260

AD-gaming

Where the case study was developed (location, country)	**Spain, Romania, Slovenia, Greece and the United Kingdom**
Organization that developed the good practice	- ASOCIACIÓN FAMILIARES ENFERMOS ALZHEIMER VALENCIA (Spain) - INSTITUTO DE BIOMECANICA DE VALENCIA (Spain) - BOURNEMOUTH UNIVERSITY (UK) - SPOMINCICA, ALZHEIMER SLOVENIJA (Slovenia) - SOCIETATEA ROMANA DE SPRIJIN A VARSTNICILOR SI A SUFERINZILOR CU AFECTIUNI DE TIP ALZHEIMER (Romania) - GREEK ASSOCIATIONOFALZHEIMER DISEASE AND RELATED DISORDERS, THESSALONIKI (Greece)
Aims and objectives of the entity responsible for the good practice	To prepare a Training platform to improve the quality of life of Dementia patients through serious games.
Case description	**AD-GAMING Project** aims to increase the technological and digital skills, as well as the ICT literacy of people with Alzheimer's Disease, their families and caregivers through the use of 'Serious Games'. In doing so, the research seeks to enhance the overall Quality of Life, social inclusion and well-being of this population. The AD-GAMING Project promotes the equality and inclusion of people with Alzheimer's Disease, enabling them to undertake an active role within their communities through gaming with their families and peers. Furthermore, it is hoped that developing people's skills, competencies and confidence in using ICT, will encourage them to engage with other forms of technology to support their well-being, such as ICT-Based Assistive Technologies.
Period of development	September 2017- August 2019
Results obtained	a Training platform to improve the quality of life of Dementia patients through serious games https://adgaming.ibv.org/en/home/
Reference link	https://adgaming.ibv.org/en/home/ https://austinpublishinggroup.com/family-medicine/fulltext/jfm-v7-id1207.php

MinD - Designing for People with Dementia

Where the case study was developed (location, country)	**UK, Luxembourg, The Netherlands, Germany, Spain, Australia, Italy, Russia**
Organization that developed the good practice	- University of Wolverhampton, UK (coordinator) - Nottinghamshire Healthcare NHS Trust, UK - Alzheimer Europe ASBL, LU - Université du Luxembourg, LU - Universiteit Twente, NL - Zorggroep Sint Maarten, NL - Panton BV, NL - Technische Universitaet Dresden, DE - Alexianer St. Hedwig Kliniken Berlin GmbH, DE - Fundació Eurecat, ES - Picharchitects, ES - Fundación INTRAS, ES - Queensland University of Technology, Australia - DU IT srl, IT - Universitat Politècnica de Catalunya, ES - ITMO University, RU - Etic Lab, UK - Manchester Metropolitan University, UK
Aims and objectives of the entity responsible for the good practice	MinD addressed the social needs of people with early to mid-stage dementia living in the community. MinD used the concepts of design and mindfulness to develop innovative design solutions that support people with dementia with self-empowerment and social engagement. It developed products to reduce anxiety and enhance quality of life, well-being, confidence, social contact and engagement for people living with dementia.
Case description	MinD had 3 stages: - data collection, - design development, - evaluation. Each stage featured user participation to help develop several products: 1) the This is Me life story board game; 2) the Living the Life mindful reflective booklet; the You and Me interactive decision-making tool; 3) Let's Meet Up!, a digital platform for social interaction with chosen family or friends.
Period of development	2016-2020
Results obtained	MinD has: - created different tools (decrived above); - developed a novel Mindful co-design methodology and guidelines to promote the involvement of people with dementia in research and development; - summarised its insights as a set of Recommendations to improve design practice, education and policy. The MinD project officially finished in February 2020, and now its activities continue through the MinD network.
Reference link	https://designingfordementia.eu/

Dementia in Cultural Mediation (DCUM)

Where the case study was developed (location, country)	Spain, Belgium, The Netherlands, Denmark
Organization that developed the good practice	- Odense Libraries and Citizens Service, Denmark. (lead partner) - Expertisecentrum Dementie Vlaanderen, Belgium - Vrije Universiteit Brussel, Belgium - Healthy Ageing Network Northern Netherlands, The Netherlands - Fundacion Instituto Gerontologico Matia-Ingema, Spain
Aims and objectives of the entity responsible for the good practice	The DCUM project developed a toolkit online showing different tools for use in cultural mediation for people with dementia. The target group of the project were Cultural Mediators, such as librarians, museum guides, who disseminate culture to people with dementia.
Case description	The project developed an open-source digital toolkit containing methods, tools and training material for cultural mediation aimed at people living with dementia. The tools on the platform developed are: - short video spots, where Cultural Mediators show and explain what methods they have used in cultural dissemination for people with dementia; - written guidelines and didactic considerations that are also attached to the video tools; - specially developed training material based on a didactic approach.
Period of development	September 2019 - August 2022.
Results obtained	The project developed various training materials and tools to keep and advise the Cultural Mediators in planning and completing the cultural activities aimed primarily at people with dementia. The project has also developed a recommendation report (to contribute to future European efforts in the fields of dementia and culture) based on the project experiences and results, as well as the outcomes from the dialogues and meetings during the project period.
Reference link	https://dementiainculturalmediation.eu/

C2brain Virtual Reality Application

Where the case study was developed (location, country)	**Sanary-sur-Mer, France**
Organization that developed the good practice	C2CARE
Aims and objectives of the entity responsible for the good practice	C2Brain is a software made for cognitive training and offers easy and ludic exercises appropriate for cognitive stimulation, sensorial therapies and memory skills. The aim is to provide support with the difficulties related to pain, aggression, autism spectrum disorders, disorientation of the elderly and awareness of addictive disorders.
Case description	The startup developed therapeutic software in virtual reality, We have won the Virtual Reality Exposure Therapies (VRET) market and today, they offer many options and therapeutic solutions worldwide. Because C2Care is at the health's service, it provides software that spans a plethora of mental health pathologies and also gives access to relaxation, neurological evaluation, functional reeducation, cognitive stimulation and many more therapeutic uses.
Period of development	Created in 2015
Results obtained	The startup won the Virtual Reality Exposure Therapies' (VRET) market and today, they offer many options and therapeutic solutions worldwide.
Reference link	https://www.c2.care/en

HappyNeuron Pro

Where the case study was developed (location, country)	**Toulouse, France**
Organization that developed the good practice	developed by the French company HappyNeuron
Aims and objectives of the entity responsible for the good practice	HappyNeuron Pro is used by healthcare professionals, therapists, and educators to support cognitive rehabilitation and intervention programs for individuals with cognitive impairments. The platform provides tools for professionals to monitor their clients' progress, customize training plans, and collaborate with interdisciplinary teams.
Case description	HappyNeuron Pro is a comprehensive cognitive training platform developed by the French company HappyNeuron. It offers a wide range of scientifically validated brain training exercises designed to improve various cognitive functions, including memory, attention, language, executive functions, and visual-spatial skills.
Period of development	The app has been operating since the early 2000s with several updates.
Results obtained	The app creates personalized training plans based on users' cognitive strengths and weaknesses, as assessed through initial cognitive evaluations. These plans adapt over time as users progress, ensuring that training remains challenging and effective.
Reference link	https://www.happyneuronpro.com/en/about-us/

Pro-Se

Where the case study was developed (location, country)	**Türkiye**
Organization that developed the good practice	**ZİÇEV** (Foundation for Raising and Protecting Mentally Handicapped Children)
Aims and objectives of the entity responsible for the good practice	To prepare a training programme (curriculum) and an implementation guide on behaviour control and development of communication and language skills in individuals with intellectual disabilities for teachers and other professionals working in the field of special education.
Case description	Within the scope of the project, a training programme consisting of 3 modules: 'behaviour change and behaviour management', 'communication and language skills development' and 'evidence-based practices' has been prepared by taking advantage of the good practices of European partners. It is important to prepare a curriculum for such a learning process and implement it with all participants in order to improve both quality and productivity and to have more sustainable processes. The developed curriculum has been adapted to the digital platform and made available to more professionals through an e-learning portal. The curriculum and e-learning portal design processes were supported by short-term joint staff training in the European partners' countries.
Period of development	22 February 2016 - 21 July 2017
Results obtained	1) Curriculum is developed 2) Non-formal education 3) E-learning platform
Reference link	https://www.zicev.org.tr/projelerimiz/tamamlanan-projelerimiz/mufredat-tasarimi-projesi

Smiling Faces

Where the case study was developed (location, country)	**Denizli, Türkiye**
Organization that developed the good practice	Denizli Municipality & Pamukkale University
Aims and objectives of the entity responsible for the good practice	Inclusion of individuals with Down Syndrome in working life
Case description	This project is coordinated by the Pamukkale University and a partner Denizli Municipality. The working life of individuals with Down syndrome in order to gain the "Smiling Faces" is a "Down Kafe" format, designed for the project. Under this project, the IQ level of 60-80 range and age level is greater than 18 with Down syndrome, Down syndrome, 14 individuals were selected. 7 college students chosen given the necessary training and the first two disabled student services, personal problems, motivation, education, and communication problems are to be responsible for. Also included in the project's family was disabled, 1 day a week in one of the best products they will be asked to issues of pie, cake, pastry, and will actively participate in the project. Used motor skills for individuals with Down syndrome is limited, the service shall be performed special apparatus
Results obtained	1) To ensure the socialisation of individuals with intellectual disabilities, 2) To provide employment to mentally disabled individuals, 3) To be an example for normal unemployed people who are in employment but not looking for a job, 4) Contribution of mentally disabled individuals to the family budget, 5) It will be seen what mentally disabled individuals can do thanks to the system to be installed
Reference link	https://gcris.pau.edu.tr/handle/11499/45941 https://gcris.pau.edu.tr/bitstream/11499/45941/1/Down%20Sendromlu%20Kişilerin%20Girişimcilik.pdf

Partnership

 Interactive 4D - France

 Austrian Association of Inclusive Society - Austria

 Eurasia Innovative Society Association - Turkey

 Euro-net - Italy

 Synthesis - Cyprus

 Alzheimer Hellas - Greece

http://game4coskills.eu