Game4CoSkills

Mobile Game for Cognitive Skills Development and Concept Teaching for Adults with Intellectual Disabilities
(Game4CoSkills)

PR1: Cognitive skills development and concept teaching scenarios

Task 8. Cognitive skills development and concept teaching scenarios

The Game4CoSkills project presents the cognitive skills development and concept teaching scenarios. Since the project aims to develop cognitive skills of adults with Intellectual Disabilities, eight teaching scenarios are analyzed to provide information about cognitive skills. The teaching scenarios refer to memory, accuracy, multitasking, colours, maths, attention to detal, logic, and dexterity.

Partnership:

Interactive 4D France

Austrian Association of Inclusive
Society Austria

Synthesis Cyprus

Euro-net Italy

Alzheimer Hellas
Greece

Eurasia Innovative Society Association
Turkey

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INTRODUCTION

The Game4CoSkills project focuses on the creation and implementation of innovative mobile games and teaching methodologies for adults with intellectual disabilities in order to improve cognitive skills and concept teaching. The project is composed of four distinct phases: R1 - Cognitive Skills Development and Conceptual Teaching Scenarios, R2 - Mobile Game for Cognitive Skills Development and Concept Teaching, R3 - Trainers' Toolkit, and R4 - Policy Recommendation Report.

R1 seeks to identify the characteristics, learning needs, and objectives of the target users in order to develop learning objectives and training schemes for cognitive skill development and concept teaching scenarios. R2 focuses on the development of eight mobile games that improve cognitive skills and concept learning by focusing on colour, memory, math, accuracy, logic, dexterity, multitasking, and attention to detail. In R3, a trainers' toolkit, including assessment tools and methodologies for using mobile games effectively with adults with intellectual disabilities, will be developed. Finally, based on the project's success, R4 will provide a policy recommendation report addressing issues and solutions in cognitive skills development and concept teaching for adults with intellectual disabilities.

The anticipated outcomes of the project include increased knowledge and capacity building for trainers working with adults with intellectual disabilities, improved cognitive skills and concept learning in adults with intellectual disabilities, and increased awareness of innovative mobile games as supplementary learning tools. The project's outcomes will be transferable and applicable to a variety of European target groups, such as seniors with dementia or Alzheimer's disease. Using innovative mobile games and teaching methodologies, the Game4CoSkills project aims to contribute to the continuous education and social integration of adults with minor intellectual disabilities.

1.1 Teaching Scenario: Memory

Provided by AIS

Topic: Home and day
Subject: Memory
Learning Outcome:

- Working in teams,
- Communicative skills,
- Conceptualization of functions of the items
- Familiarization with words,
- Development of short term and mid-term memory,
- Ability to associate words, pictures and functions

Introduction to the scenario:

The instructor will conduct a series of lessons to develop participants' short term and mid-term memory skills through familiarization and understanding of the objects and their functions in the house. The instructor will create a demonstrative chart with a model house and explain the parts of the house, the items in these parts and their functions. Then participants will do an activity allowing them to recall the house and items and match items with the areas of the house. Later, participants will conceptualize the functions of the items and their relevance and develop their memory on that. Finally, the participants will be asked torecall their house life and instill what they learned to their house lives.

Curriculum: The curriculum can be used as a life-skills development for adults with intellectual disabilities and it specifically targets life-skills at home, along with recalling and associative skills. The activities will not only help adults develop their short and mid- term memories, they will also help them work in teams and communicate with each other. The visual materials to be provided to the participants will enable visualization of items existing in their lives and will allow for easier association. Finally, the drills and repetition will help them strengthen their memory skills.

1.1 Teaching Scenario: Memory

Prerequisites (necessary materials and online resources):
- Charts,
- Flashcards,
- Board marker,
- Screen, board

Before the program begins (preparatory work for trainers):

A demonstrative chart or a model of a house with details of the parts of the houses is needed. In addition, the instructor could also provide smaller demonstrative models/charts and flashcards/small cards with pictures of household items that can stick to the demonstrative models/charts. In addition, a number of pictures of items from home will be needed as well.

The main part of the scenario (amount of lessons):

Lesson 1

The participants are shown, on a big chart or screen, the parts of the house with items belonging to the specific areas of the house (sofas in living room, refrigerator in the kitchen etc.). Then, each participant is given charts with a plan of the house with blank spaces, and separate cards with objects from the house. Participants are asked to put the items to the related areas in the house.

Lesson 2

Instructor divides the participants into groups of two people. One person from the group can look at the board, while the other cannot. Then, the instructor puts pictures from daily life with a certain order (fork, spoon and a plate or sofa, cushion and TV etc.) on the board and then takes them out instantly. Then, the participants looking at the board should remember the order of the objects and tell their peers to put pre-prepared cards in order. In order to increase the difficulty, instructors can shorten the time, or increase the items. Finally, the peers switch places and play the game in a different order.

Lesson 3

Instructor asks the group to make a circle. They can use the chairs or sit on the ground. One person in the circle begins speaking by saying "Today, I will do (eating, showering, watching TV, sleeping etc.) in (the place of the house). The person on the line repeats the phrase of the previous person, then adds their own action and place. If the group s too large, the instructor can limit the number of previous persons to be repeated to 5 or 3 persons.

Resources:

https://www.elder.org/the-elder/improve-memory-and-mental-health-25-brain-games-for-the-elderly/

https://www.mentalup.co/blog/memory-games-for-seniors

https://www.weareteachers.com/working-memory/

https://www.yourtherapysource.com/blog1/2022/07/04/memory-games-for-the-classroom-2/

1.2 Teaching Scenario: Accuracy

Provided by Eurasia

Topic: Solve the Puzzle

Subject: Accuracy

Learning Outcome:

- Oral and written accuracy;
- Familiarity with the words;
- Working in teams;
- Pairing oral and written elements with visual materials;
- Ability to associate words and pictures;
- Recognition of words through concretization method;
- Read-aloud strategy.

Introduction to the scenario:

Instructor or expert will create a crossword puzzle with hints included. Both hints and words should be easily comprehensible for the participants. Following the completion of the puzzle, participants will create a sentence with each word. After that, they will read it out loud. They will also create word clouds using word cloud generator. Every student contributes to the cloud. In addition to that, they will associate each word with a picture. When the words are paired with visual materials it will be easier for them to understand and concretize the words. Instructors can also prompt students with simple, not complex questions such as "where do you experience that term/word?" Eventually, based on all the words and sentences, participants create a short & simple story.

Curriculum:

The curriculum will be used for adults, and specifically, this teaching scenario aims to improve the adults' oral and writing accuracy skills. They will get more familiar with the words and understand the correct use of words in a sentence more properly which will reflect on their communication skills. They will be supported through visual materials and various websites. Various activities based on the exact words will guarantee the regular repetition of the words, which will help the participants remember them.

Prerequisites (necessary materials and online resources):

- https://www.wordclouds.com/
- Popplet
- Computer/assistive technology
- Board marker
- A4 Papers
- Highlighter
- Crayons

Before the program begins (preparatory work for trainers):

Crossword puzzles should be created before the program. Words should be chosen considering the target group. Hence, it is preferable to avoid abstract terms. The instructor should be ready to prepare relevant.
and appropriate pictures to facilitate the comprehension process. The environment should be organized in a way that avoids any
distractions for students.

The main part of the scenario (amount of lessons):

Lesson 1

The instructor divides the class into a maximum of 4 minimum 2 groups depending on the number of participants. Afterwards, they will work in groups to solve the crossword puzzle using hints. Each volunteer will write the answer on the board, make a sentence including the word and read it out loud. Others will react with emojis "Smile", "Good Work", "Thumbs Up." In the end, they will create a word cloud.

Lesson 2

The instructor will select appropriate pictures beforehand, and students will associate each picture with the word. People might be used for associating purposes. That will facilitate the comprehension process and they can concretize the words. Instructors can also prompt them with various but not complex questions such as "where do you experience that term/word?".

Lesson 3

Based on all the words and sentences, students create a collective story. Context of the story is provided by the instructor. Each group writes a part of the story, in the end a volunteer from each group reads their part of the story. All the parts are merged to have a complete story. Groups exchange their papers and highlight the words that they think are wrong and try to explain with the support of the instructor.

Resources:

https://my.vanderbilt.edu/speds2430/2020-topics/intellectual-disabilties/
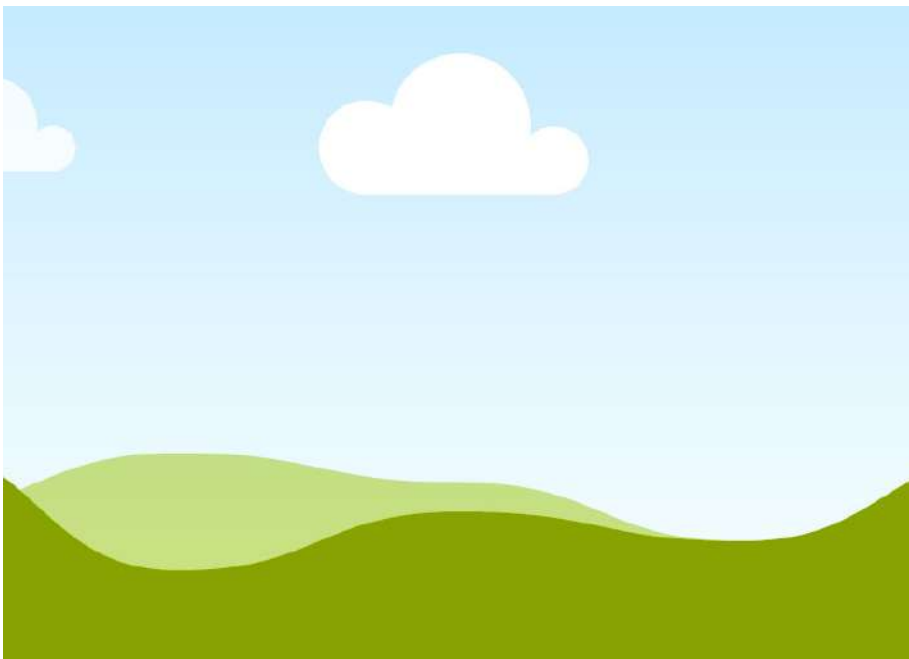
https://www.ldatschool.ca/oral-language-skills/ https://www.teachspeced.ca/intellectual-disabilities?q=node/729 https://www.teachspeced.ca/intellectual-disabilities?q=node/714

https://mp.uu.se/en/web/info/undervisa/e-larande/laborativ-larosal/pedagogiska-scenarier

https://www.therapytravelers.com/strategies-teaching-students-intellectual-disabilities/

https://do2learn.com/disabilities/CharacteristicsAndStrategies/IntellectualDisability_Strategies.html

https://ggie.berkeley.edu/adapting-practices-for-students-with-special-needs/

https://ggie.berkeley.edu/practices/

https://www.ws.edu/student-services/disability/teaching/learning.shtm

https://theeducatorsroom.com/teach-students-intellectual-disabilities/

https://ldaamerica.org/info/successful-strategies-for-teaching-students-with-learning-disabilities/

https://ablelight.org/blog/social-stories-for-people-with-disabilities/

1.3 Teaching Scenario: Multitasking

Provided by EURO-NET

Topic:
Multitasking
Subject:
Multitasking
Learning Outcome:
This scenario will permit the adult learners to:
- play an interactive role
- have a pro-active role for the whole world with simple behaviors
- feel themselves active and positive
- practice their normal world with a different point of view - solve practical daily problems to
 reduce energy consumption or waste

Introduction to the scenario:
The scenario's main objective is to allow adult learners with disabilities to work in their typical daily environment to choose the best options to reduce energy consumption or waste around them, having a positive role in society with simple and normal behaviors.

Curriculum:
The learners will work on the proposed scenario using different ways to solve the game-problems presented. The scenario will present scenes related to normal life activities and to energy saving and they have to choose the right answers using different tools.
An example is a kitchen room where there are:
- a fridge
-an oven
-a kitchen sink
-a pot on the fire
-a pendant light fixture
As (just to give an idea) in the image below

The learners have to decide what to do to reduce energy consumption, for example:
1) put less water in the pot
2) cover the pot with a pot lid
3) do not arrive to 100° to cook the "pasta"
4) use electric stove
5) use energy saving light bulbs
6) etc.
Each time they will do an action it will appear an explanation say them if the choice is correct or not and why.

Prerequisites (necessary materials and online resources):
- Having an internet connection to play it online on the App/Platform
- Having a mobile phone or a tablet to play

Before the program begins (preparatory work for trainers):
Trainers could prepare the learners explaining how it is important to save the environment and how it is fundamental that all citizens do something for this every day.

The trainers also:
- have to manage their time in order to organize the lessons
- should make practice of the activities before introduce them to the adults learners
- play the games before presenting them to learners
- follow and suggest the adult learners if necessary

The main part of the scenario (amount of lessons):

Lesson 1:
In the proposed scenario, there will be a short animation that will present the right order of the things to cook "pasta" reducing the energy consumption. Then the players have to remember the right order (game of memory) to cook putting the images of each step in the right step order.

Lesson 2:
In the proposed scenario, there will be the possibility to drag and drop the right actions to be done to reduce the energy or the waste. For instance, the learner can choose between a normal consumption light bulbs and energy saving light bulbs and choose the ones (game of right choices) that permit to reduce consumption; or put the right waste in the right appropriate trash can (paper, plastic, etc.); or choose the electric stove in place of gas cooker; close the fridge; etc.

Lesson 3:
It is possible to create similar scenarios, in which there will be a quiz on specific behaviors that can help the environment (QUIZ GAME with images). For instance: is it better to use bicycle or car?

Better a train or a plane?
And so on.

1.4 Teaching Scenario: Colours

Provided by: Interactive 4D

Topic: Colours
Subject: Differentiating Colours and Objects through Colours **Learning Outcome:**
Participants will be able to:
- Enhanced visual perception,
- Increased recognition of objects,
- Boosted memory skills,
- Increased attention skills.

Introduction to the scenario:

Participants, individually, play the game under the section "colours" on the platform. The games provided on the platform are based on the level of difficulty, therefore, when playing the game, participants and trainers will be able to test the abilities of the participant on perceiving and differentiating colours and objects through colours.

The group game in the end is available for adults with mild to medium severity mental disabilities and aims to increase participants communicative and group work skills as well as increasing their cognitive abilities.

Curriculum:

The curriculum will be used for adults with mild to severe mental disabilities. The lessons provided within the curriculum are planned in a way togradually test the ability of the participants and enhance their visual perceptions and differentiation skills through providing the games on the platform, along with the activities that exploit the game as an educational resource.

Prerequisites (necessary materials and online resources):
- Printed version of the provided cards in colours
- Scissors for cutting the papers and cardboard and glue (optional) for extra durability of the game materials

Before the program begins (preparatory work for trainers):
While the individual games on the platform don't require special preparation for the trainers, it is advised to check the progress of the adults when playing the games and monitor their level of competence during the game, in order to the repeat the sections that are challenging and also prepare the group game in accordance with the competence level of participants. Also, when preparing the printed colour cards, it is advised to limit the number of boxes if the level of differentiation and perception of the participants are lower, with use of transverse colours to support the perception of participants.

The main part of the scenario (amount of lessons):
The curriculum consists of two parts, individual gameplay, and a group game.

Lesson 1:
During the individual gameplay, participants will be given a mobile device (preferably) or a computer to play the colours game on the platform. The games are of three different levels, respective of level of difficulty. While the first game aims to test and develop participants basic colour perception skills, with higher level of difficulty, aims to merge colour and object perception, asking players to eliminate the odd one out. In the last individual game, the players are asked to recognize the number within a given shape, with a slight difference in colours, thus with an increased difficulty in differentiating colours and objects.

For adults with mild and mid-range mental disabilities, the trainers are advised to spare 15 minutes for participants while for adults with severe mental disabilities, it is advised to spare 20-25 minutes for the exercise.

Lesson 2:

In the second lesson, trainers, based on the level of competence of players in colour recognition and differentiation, will utilize a pre-prepared colour cards for a memory game, that will consolidate participants' skills in colour differentiation and memory skills.

The trainer, after having printed and prepared the colour cards with two copies on different tables, will decide on how many card to use in line with the level of competence of participants It is advised to use one line of colours with adults with severe disabilities.
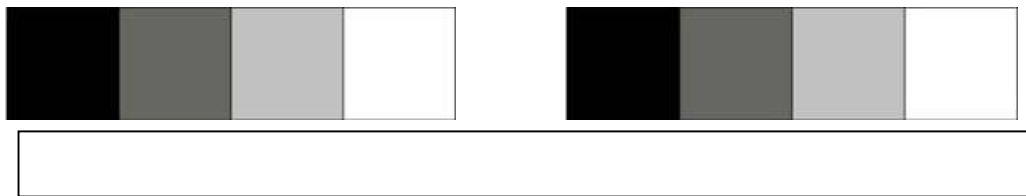
Recommended colour cards for playing with adults with severe mental disorders.The trainer explains the game to the participants. Of all the cards facing down, the player picks one card and call out the colour. Then, goes to a different table with the same set of cards facing down, the participant tries to turn in a card with the same colour on it. For adults with mild to middle range mental disabilities, trainer can increase the number of colour cards, as well as encouraging participants to give hints to the others and cooperate to support team building and communicative skills. The game can last for 25-35 minutes for groups of 8 adults, depending on the level of mental disability.

1.5 Teaching Scenario: Maths

Prepared by SYNTHESIS Center for Research & Education

Topic: Numerical Connect Four

Subject: Maths

Learning Outcome:

This scenario will allow students to:

- practice basic math equations
- understand the difference between whole numbers and integers
- work with other people (if this activity is done in teams)

Introduction to the scenario:

In this scenario, students will play a game of connect four, but they will only be able to place a disk on the board after correctly answering an arithmetic problem. The object of the game is to be the first person or team to line up four disks in a row. The players must solve addition, subtraction, multiplication, and division problems using whole numbers and integers. The facilitator can also choose the level of difficulty and the time limit for each question. This activity works well in groups of two for about 25-30 minutes, or it can take about 10-15 minutes if only two people play.

Curriculum:

There is no universally acknowledged definition of mathematics. Numerous schools of thought have proposed very various definitions. Aristotle gave mathematics its first definition when he referred to it as the "science of quantity." A more contemporary definition of mathematics is given by the Oxford English Dictionary which defines it as "the abstract science which investigates deductively the conclusions implicit in the elementary conceptions of spatial and numerical relations" (1933).

Another term that has recently been used in relation to education and the teaching of mathematics is "numeracy."Numeracy, according to Evans "is the ability to process, interpret and communicate numerical, quantitative, spatial, statistical, even mathematical, information, in ways that are appropriate for a variety of contexts, and that will enable a typical member of the culture or subculture to participate effectively in activities that they value" (2000).

Numeracy has been identified as a crucial facet of all people's lives, with applications in employment, personal, and civic responsibilities. While there is widespread agreement on the importance of numeracy, little is known about its role in the lives of people with intellectual disabilities and whether they retain numeracy knowledge and abilities into adulthood.

Individuals with cognitive impairments may struggle to grasp numbers and their significance; as a result, other methodologies designed specifically for teaching maths to people with cognitive deficits may be required. This will equip them with the numeracy skills they need to live independent and fulfilled lives in society.

Maths is a critical subject to learn, but it often demands effort, concentration, and—most importantly—understanding its principles. Conventional mathematical rules may sometimes be rather challenging and perplexing for persons with cognitive disabilities.

When it comes to teaching maths, there is a deeply embedded tendency to focus on formulas and shortcuts. Although certain people can memorise formulas and mathematical principles without a thorough understanding of the concepts or processes involved. However, a conceptual understanding of maths may help students to comprehend the structure, knowledge, synthesis, and arrangement of numbers. Therefore teaching students not just how to do something, but also why they should do it, is what conceptual understanding includes. People can perceive the wider picture that underpins all math themes and activities via conceptual knowledge, helping them to think more fluidly, apply their mathematical abilities in a variety of circumstances, and employ critical thinking skills.

Prerequisites (necessary materials and online resources):
- Connect 4 game
- Prepared math problems of different difficulty levels
- Timer

Before the program begins (preparatory work for trainers):
The facilitator must be familiar with the game "Connect Four", and be prepared to explain the rules1 of the game. The facilitator should also prepare some mathematical problems and categorise them by the level of difficulty. These questions can include
- Whole and integer number addition
- Whole and integer number subtraction
- Whole and integer number multiplication
- Whole and integer number division

The main part of the scenario (amount of lessons):
This exercise is based on the classic game "Connect Four," in which two players alternately place a disk on a board, and whoever connects four disks first wins. This is a numerical spin-off of this strategy game, where each player has to answer a mathematical equation before they get to place a disk on the board. Like in the original game, the goal is to get four disks in a row before the other person does and answer as many questions correctly as possible.

Steps:
1. Split the students into pairs or two teams if the class is bigger. The opponent players/team need to face each other and place the Connect Four board in between them. Let the players decide which colour disk they want to represent themselves/their team.
2. Do not give any of the disks to the players. In order to get a piece, they need to answer correctly a mathematical problem. Set your timer to fifteen seconds and ask one of the questions to the first player/team. If they get the answer correct, give them one of the disks (the colour that they represent), and ask them to place it on the board. Repeat the same process until one of the players/teams connects four disks of their colour either horizontally, vertically, or diagonally. If the player/team does not answer the question correctly they lose their turn and the other player/team gets the opportunity to answer the question for a disk. You can make it more challenging each round by asking a more difficult question and shortening the time period each player has to answer the question.

https://daroolz.com/play/connect-4/

1.6 Teaching Scenario: Attention to detail

Prepared by SYNTHESIS Center for Research & Education

Topic: Observation game
Subject: Attention to detail
Learning Outcome:
● Improve analytical skills
● Encourage clear thinking
● Develop accuracy skills under pressure

Introduction to the scenario:
The objective of this scenario is to address the functions that influence a person's visual attention to detail. Visual attention to detail is essential in everyday life, and having excellent visual attention abilities can enhance your safety. When you drive, you pay attention to possible hazards and pedestrians crossing the street. Participants in this activity will carefully examine a picture or image and recall specific features from it. It will need participants to engage their visual attention and memory, often known as the sense of observation.

Curriculum:
Attention to detail typically refers to a focus on the minor details that comprise a larger task or issue. Attention is a complicated process that all of us employ in our daily life. Scientists and researchers have discovered that attention is a collection of attention sub-processes rather than a single activity; attention to detail involves other skills such as accuracy, focus, and thoroughness. The American philosopher and psychologist William James distinguished attention to sensory attention prompted by external factors and voluntary attention to both external and internal stimuli (1890).

The hierarchical model from Sohlberg and Mateer (1987, 1989, 2001, 2010), which is based on clinical examples of experimental neuropsychology, is presently the most acknowledged model for attention sub-components. The attention model is made up of five components: focused attention, sustained attention, selective attention, alternating attention, and divided attention.

Focused attention
The basic response to external or internal stimuli is focused attention. Stimuli might be audible, visual, haptic, or cognitive in nature. We utilise focused attention, to attend to both internal cues (e.g. feeling hungry) and exterior stimuli (e.g. noises). Although it is considered to be the lowest level of attention, it is a crucial ability that allows us to carry out activities in our everyday lives with care and efficiency.

Sustained attention
The capacity to maintain attentional focus on relevant stimuli over long periods of time is referred to as sustained attention. An example of this is the act of reading a book. In order for an individual to be able to process information, they need to utilise sustained attention. Sustained attention is also known as one's attention span. It occurs when we can maintain our concentration on a single event rather of losing it and needing to refocus.

Selective attention
Selective attention refers to the mechanisms that enable a person to choose and concentrate on certain stimuli for further processing while ignoring irrelevant or distracting information. An example of this is having a conversation with another person in a crowded and noisy environment.

Alternating attention
Alternating attention is the ability to shift your concentration back and forth between tasks that involve different cognitive demands. It requires the mental flexibility to disrupt one task in order to perform another task, and then be able to return to the nitial task. An example of alternating attention is typing an email, then stopping to answer a phone call and having to return to the email writing.

Before the program begins (preparatory work for trainers):
Prior to the activity, the facilitator will have to choose a set of clips from films, tv series,
online videos, etc or an image with a lot of details in it. If you are using video clips, prepare a question that is related to each clip. If you are using an image, prepare multiple questions relevant to your image. The questions can range from something that was said in the dialogue, an element in the background, what a character is wearing, names of characters, etc. Using clips/images that are relevant to your participants would also motivate them to pay closer attention.

The main part of the scenario (amount of lessons):
1. Split your participants into groups. Hand some pieces of paper and a pen to
each group.
2. Play the first clip you have chosen and set the question you have prepared for that clip. Ask the groups to write their answer to the question on a piece of paper. Set a time limit and once the timer is up, ask the groups to reveal their answers.
3. Keep repeating this process until you have run out of video clips. You can make it more challenging by increasing the difficulty level of the question; the more
detailed it is, the harder it will be.
4. If you are using the image instead of the video clips, let the students observe the image for two minutes and then turn off the projector/screen. Set the prepared questions one by one, and ask them to write their answers on the
available pieces of paper.
5. For each correct answer, the group gains a point, and the winning group is the
one who will collect the most points by the end of this ex

1.7 Teaching Scenario: Logic

Prepared by Alzheimer Hellas

Topic: Logic
Subject: Logic
Learning Outcome:
There are rational ways to figure out what is true, ways that have been tried and true. It is possible to infer new conclusions from known facts using well-established, logical methods. Because of how ignorant we are, people frequently seek the advice of authorities before making decisions. Despite this, one must still use reason because one must choose which authorities to respect. Since there is nothing that can properly replace it, every genuine intellectual endeavor ultimately depends on logic (Copi et al., 2011).

Logical thinking is the process of observing, analyzing, and drawing conclusions based on those inferences. To put it in the simplest of terms, logical thinking uses facts and evidence to reach a conclusion or solution; it is the use of both logic and reasoning in the thought processes. There are many different kinds of logic and logical thinking, including (Yunus, 2021):

- **Formal logic.** We usually consider formal logic the more "traditional" type of logic. Sometimes referred to as philosophical logic, it has to do with logic based on the argument's informal settings.
- **Informal logic.** Similar to formal logic, informal logic is the use of logic outside of the formal settings or in everyday settings.

- **Mathematical logic.** This is a subfield of mathematics that focuses on formal logic as it pertains to mathematical applications.

- **Inference.** This is a process that infers a logical conclusion based on a premise, not explicit statements. To infer is to deduce, or conclude, based on evidence and reasoning.

- **Inductive reasoning**. This is a logical thinking process that forms generalizations based on specific observations known to be true or false.

- **Deductive reasoning.** This uses formal logic to prove, or disprove, a theory. It begins with a theory or hypothesis and seeks to support the observations.

- **Abductive reasoning.** Similar to deductive reasoning, abductive reasoning seeks to prove observations.

- **Critical thinking.** This is an analysis of facts and evidence to form a judgment or reach a conclusion. (Swestyani et al., 2018)

Several sessions will be worked with the students to be able to complete different activities that allow the learning of the concepts.

Introduction to the scenario:
The main object of the stage is to work on the concepts of logic. Adults have to put cards into the correct sequence and create a story using critical thinking, choose the correct-incorrect statement using logic, put cards together and show the cause and effect of an action.

Several sessions will be worked with the adults with mild ID to be able to complete different activities that allow the learning of the concepts.
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Curriculum:
Logical reasoning is the process of arriving at a conclusion using a rational, systematic series of steps based on sound mathematical procedures and given statements. In logic, there are two broad methods of concluding: deductive reasoning and inductive reasoning.

Deductive reasoning begins with a broad truth (the major premise). This is followed by the minor premise, a more specific statement. A conclusion follows. The conclusion cannot be false if the major premise is true and the minor premise is true. In inductive reasoning, broad conclusions are drawn from specific observations; data leads to conclusions. If the data shows a tangible pattern, it will support a hypothesis. For example, having seen ten white swans, we could use inductive reasoning to conclude that all swans are white. This hypothesis is easier to disprove than prove, and premises are not necessarily true, but true given the existing evidence and given that one cannot find a situation in which it is not (Swestyani et al., 2018).

The curricular adaptation includes lessons structured and designed according to educational procedure. Through the interaction with the activities, adults will practice their cognitive skills of logic.

Prerequisites (necessary materials and online resources):
Colourful sequence cards and online pictures about sequencing will be used. Big pictures, printed and online, will be used.

Before the program begins (preparatory work for trainers):
Trainers have to see and organize the correct sequence of the cards. They must know the story and the correct sequence for the evaluation of the adults, while they will practice with the activity.

The main part of the scenario (amount of lessons):
Lesson 1: Each adult individual will receive four cards (pictures) with incorrect sequence. They have to notice the pictures and understand which the correct sequence of the pictures is. By putting pictures in a correct sequence they will create a story. The story must include begin, middle and end. Through this activity, adults will practice their critical thinking. . Pictures will be in color to be shown clearly all the necessary details (Doenyas et al., 2014).

Lesson 2: Adults will receive four colorful cards. The sequence of the given cards will be mixed. By observing the cards, adults have to realize their correct sequence and the main point of the story. They also practice to cause and effect, since some stories will include effects of previous actions (Alsaleh, 2020).

Lesson 3: Adults will receive one colorful pictures and they have to observe it. After the observation, they will have to put a tick in the sentence with the correct statement based on the picture they have each time. For example, the picture shows a street, people to cross the street, a school and many cars. One sentence will say that the picture refers to a village. The adult must answer that this statement is false (Alsaleh, 2020).

Lesson 4: Adults will receive a paper with written sentences and two pictures. The context of the sentences will refer only to the one picture. After reading the sentences, they have to decide which picture match better to the sentences. For example, written sentences are: I need a bottle of milk. Payment only with cash. Biscuits, chips and chocolate are on the first floor. They will receive one picture of a supermarket and one picture with street market. They have to decide with which picture these sentences match better. Supermarket is the correct answer, due to the lack of floors in the street market and the bottles of milk are available in the refrigerator of the supermarkets. Payment method is available in every market (Novak & Cañas, 2008).

Example

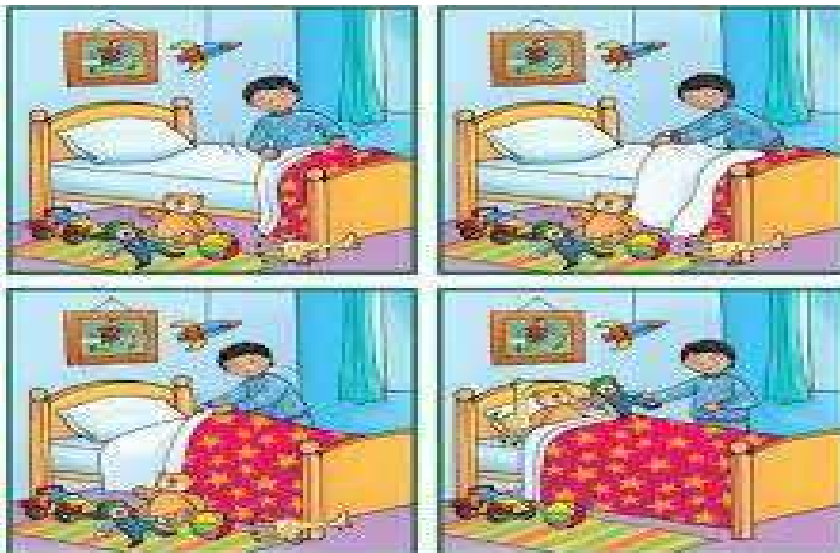Choose the picture which match with the following sentences.

I need a bottle of milk

Biscuits, chips and chocolate are on the first floor.

Payment only with cash.

(Rashidov, 2022; Novak & Cañas, 2008; Alsaleh, 2020).

Sequence picture cards

(Oliver-Kerrigan et al., 2021).

1.8 Teaching Scenario: Dexterity

Prepared by Alzheimer Hellas

Topic: Dexterity
Subject: Dexterity
Learning Outcome:
Dexterity is a term referring primarily to the ability of a person to "gracefully" coordinate their movements. It specifically refers to adroitness in using the hands. In this context, dexterity is a motor skill.

The term can also refer to intelligence and "mental dexterity. "Dexterity (or fine motor skills) is the coordination of small muscles, in movements-usually involving the synchronization of hands and fingers- with the eyes. There are two types of Dexterity- Gross motor skills and Fine motor skills (Kobayashi-Cuya et al., 2018; Mathiowetz et al., 1985).

Introduction to the scenario:
The main object of the stage is to work on the concepts of dexterity. Adults have to use their manual dexterity and collect and put in the correct position big pieces of a puzzle. Another activity is to correctly put 3D pieces of an animal and create a 3D animal picture. Several sessions will be worked with the adults with mild ID to be able to complete different activities that allow the learning of the concepts.

Curriculum:
Dexterity refers to agility, grace, and fine motor skills. Alternatively, an applicant's dexterity can also be described as their capacity to use tools of their trade effectively and correctly.

Dexterity skills include:
- Hand-eye coordination
- Coordination and agility while performing duties
- Handling tiny electronic parts
- Time management and coordination of the movements
- Attention
- Perception (Makofske, 2011).

Prerequisites (necessary materials and online resources):
Big pieces of 24-piece puzzles will be used. The pieces will have a big size in order to be easy for the adults to put them in the correct position. 3D printed pieces will be a part of the lessons.

Before the program begins (preparatory work for trainers):
Trains should prepare and manage their time in order to organize the lessons. They should practice the activities before introducing them to the adults. They have to understand the complexity or the potential difficulties that adults will face during each lesson. They will prepare the tools which will be used, organize them and make clear what instructions will be given as a guide to the adults.

The main part of the scenario (amount of lessons):
Lesson 1:
Trainers will give the adult a puzzle. The structure of the puzzle will consist of 24 big pieces, easy to grasp, to be placed correctly and to make it easy to understand which piece matches each time. Adults have much time to think, concentrate and make their efforts to complete the puzzle and create the picture (De Kegel & Haahr, 2019).

Lesson 2:
3D pieces of the body of an animal will be printed. The adults have to follow the steps which be included in a list and create a 3D animal. During this lesson, adults have to cope with their attention, concentration, coordination of eyes and motor movement. They also have to touch and put the pieces with specific intensity avoiding breaking the constructed animal (van Deventer, 2019).

Lesson 3:
A simple trial of origami will take place. The trainer will explain to the adults what
they have to do each time and give them a piece of paper with the following steps (Lu
et al., 2020).

Lesson 4:
Flipping the coins all one direction (either heads or tails side up) and stacking the coins on top of each other as a simple and affordable fine motor activity. This activity helps develop grasp and release functions and careful placement. Through this lesson, adults should show patience and fine motor skills, while the movements should be slow and with great attention (Egawa & Katsura, 2021).
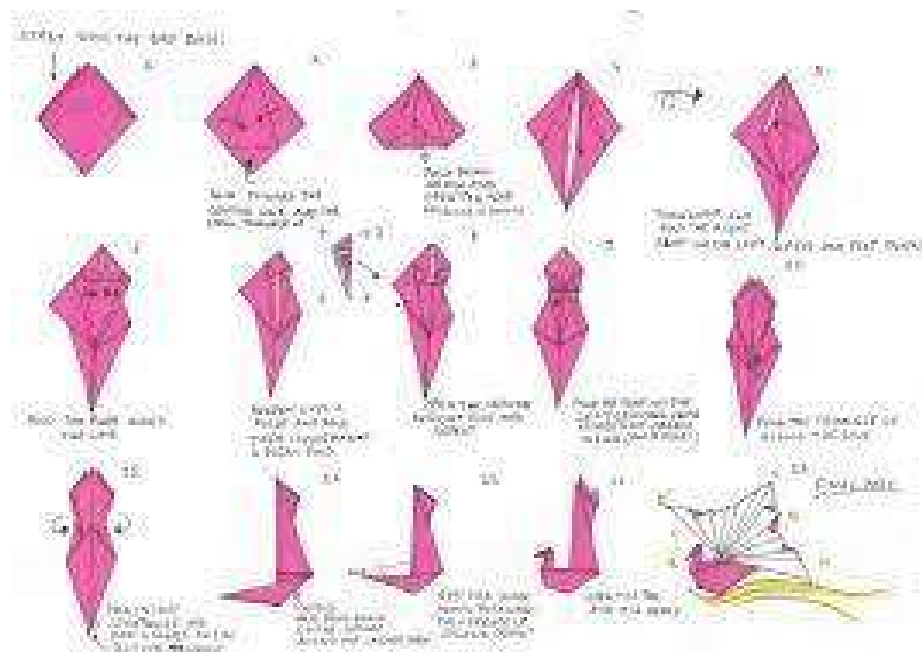
Example

Flipping the coins

(Egawa & Katsura, 2021)

Puzzle

Origami

(Lu et al., 2020)

Alsaleh, N. J. (2020). Teaching Critical Thinking Skills: Literature Review. Turkish Online Journal of Educational Technology-TOJET, 19(1), 21-39. Copi, I., Cohen, C., & Rodych, V. (2011). Introduction to Logic (14th ed.). Routledge.https://doi.org/10.4324/9781315510897

Doenyas, C., Şimdi, E., Özcan, E. Ç., Çataltepe, Z., & Birkan, B. (2014). Autism and tablet computers in Turkey: Teaching picture sequencing skills via a web-based iPad application. International Journal of Child-Computer Interaction, 2(1), 60-71.

Novak, J. D., & Cañas, A. J. (2008). The theory underlying concept maps and how to construct and use them.

Oliver-Kerrigan, K. A., Christy, D., & Stahmer, A. C. (2021). Practices and experiences of general education teachers educating students with autism. Education and Training in Autism and Developmental Disabilities, 56(2), 158-172.

Rashidov, A. S. (2022). USING OF PROBLEM EDUCATIONAL TECHNOLOGIES IN THE DEVELOPMENT OF STUDENTS' CREATIVE AND LOGICAL THINKING SKILLS. Berlin Studies Transnational Journal of Science and Humanities, 2(1.5 Pedagogical sciences).

Swestyani, S., Masykuri, M., Prayitno, B. A., Rinanto, Y., & Widoretno, S. (2018, May). An analysis of logical thinking using mind mapping. In Journal of Physics: Conference Series (Vol. 1022, No. 1, p. 012020). IOP Publishing.

Yunus, Y. S. (2021). Features of Logical Thinking of Junior Schoolchildren. Middle European Scientific Bulletin, 10.

De Kegel, B., & Haahr, M. (2019). Procedural puzzle generation: A survey. *IEEE Transactions on Games*, *12*(1), 21-40.

Egawa, K., & Katsura, S. (2021, June). A Design of Tendon-Driven Mechanism for Flipping Motion on Robotic Finger. In *2021 IEEE 30th International Symposium on Industrial Electronics (ISIE)* (pp. 1-6). IEEE.

Kobayashi-Cuya, K. E., Sakurai, R., Suzuki, H., Ogawa, S., Takebayashi, T., & Fujiwara, Y. (2018). Observational evidence of the association between handgrip strength, hand dexterity, and cognitive performance in community-dwelling older adults: a systematic review. *Journal of epidemiology*, JE20170041.

Lu, Q., Clark, A. B., Shen, M., & Rojas, N. (2020). An origami-inspired variable friction surface for increasing the dexterity of robotic grippers. *IEEE Robotics and Automation Letters*, *5*(2), 2538-2545.

Makofske, B. (2021). Manual Dexterity. In Kreutzerm J.S., DeLuca, J., Caplan, B. (eds) Encyclopedia of Clinical Neuropsychology. Springer, New York, NY. https://doi.org/10.1007/978-0-387-79948-3_1460

Mathiowetz, V., Volland, G., Kashman, N., & Weber, K. (1985). Adult norms for the Box and Block Test of manual dexterity. *The American journal of occupational therapy*, *39*(6), 386-391.

van Deventer, O. (2019). That Is Not Art, It Is a Puzzle!. In *Bridges 2019 Conference Proceedings* (pp. 1-8). Tessellations Publishing.