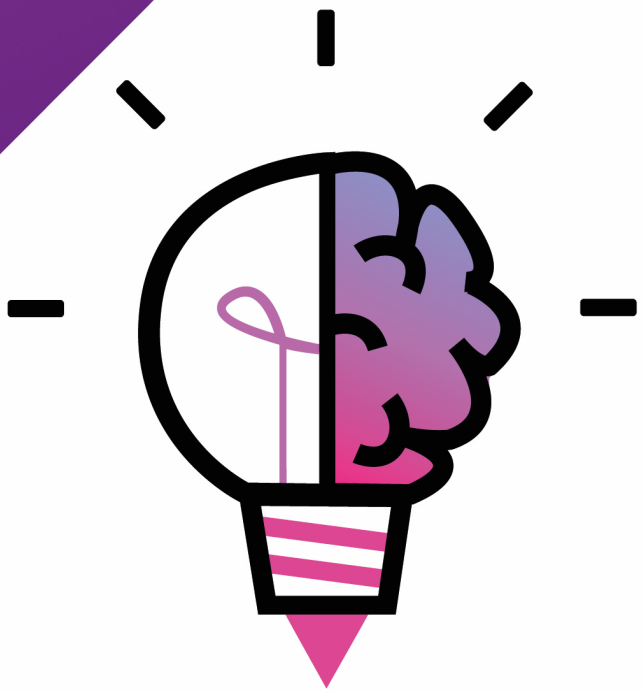
Erasmus+



3D4ELDERLY

PROJECT NUMBER: 2020-1-LT01-KA204-077896

IO1A3

Methodology for creating new 3D printing exercises for people with Alzheimer and elderly people with dementia

CONSORTIUM OF PARTNERS:

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Introduction

This document was developed under the project 3D4ELDERLY- "3D printing to create innovative learning pathways for caregivers and staff members dealing with people with Alzheimer and elderly people with dementia" (project number: 2020-1-LT01-KA204-077896) is a project supported by the European Commission through the Erasmus+ programme, Key Action 2- Strategic partnership for adult education.

The aim of it is to provide to staff that are dealing with people with Alzheimer and elderly people with dementia, a tool, that could help them in defying exercises in which 3D models have a key role.

The template is composed of different parts, some are technical and related to 3Dprinting and other are related with the Alzheimer and dementia specification.

For completing the template is not necessary to have a technical background or expert in 3D design to shape the exercise defined.

The use of 3D printing technology with people with Alzheimer and elderly people with dementia

Dementia is an acquired, irreversible and progressive disease that lasts on average between 7 and 12 years from the time of diagnosis. It affects human cognitive functions, memory and concentration. It develops gradually and leads to a change of personality. People with dementia have a memory problem, which leads to word search and speech problems, problems with coordination, abstract thinking, concentration, planning, orientation to place and time, frequent mood swings, refusal of social contacts.

Most often, specialists divide the course of the disease into three stages or phases: mild, moderate and severe. https://www.alz.org/alzheimers-dementia/what-is-alzheimers

Activities in the mild and moderate phase of dementia are needed to slow down the development of memory loss, problem solving, time and space orientation, stimulating social contacts.

Some general instruction to take in mind when we are developing exercises for people with dementia and Alzheimer are:

- The games must be in accordance with the personal history of the patient, as well as in which phase of the development of the disease is the person with dementia.
- An interview must be conducted with the relatives of the patient and with the patient herself/himself. The purpose of the interview is to choose together what type of activities are useful for the individual depending on personal history, preferred activities, and disease progression.
- The 3D didactical exercises are divided into two main indicators:
    - Method of application - individual or in a group of 2 to 6 people;
    - What basic skills do they recall and retain - concentration, attention, math skills, planning and dexterity, memory, memories;

- In individual games there is a facilitator who presents the task, and the person with dementia performs it independently or with the help of the facilitator (or the patient's relative). They are suitable in a family environment and in individual care.

- Group games are suitable for care homes for old people and day care centers for people with dementia. Here, again the facilitator presents the exercise, but the actions are carried out in a group of 2 to 6 people.
- The role of the facilitator is to start the exercise, to explain the rules (if one of the participants does not remember them from childhood) and to help with the task.

TEMPLATE FOR THE DEFINITION OF THE EXERCISES

The definition of the exercise consists of three parts which are described below:

1. The first part refers to the generic aspects of the exercise to be defined: name, name of the model, to which kind of cognitive area is related and so on….
2. In the second part, it is specified how the model can be used with people with Alzheimer and dementia, which are the main benefits on them
3. The third part covers the technical specifications of the model.

GENERAL INFORMATION

EXERCISE NAME:	In this section you should insert the name of the whole exercise and this should be different from the model's name.
MODEL NAME: (COULD BE THE SAME AS THE EXERCISE NAME)	The model's name should identify the item you want to print.
WHICH COGNITIVE AREA IS IT RELATED TO?	This part is related with the cognitive area that the exercise is going to train. You should specify here to which area is addressed. It could be more than one.
DESCRIPTION OF THE EXERCISE:	In this section you should describe how the exercises will be used in the process of training. You could divided the section in steps or phases to give more details as possible.

3D MODEL

WRITTEN DESCRIPTION OF THE 3D MODEL:

In this section, you have to describe the model aesthetically giving all the possible information so that the designer can have a first idea of what to design.

Please be as detailed as possible in describing shapes, colours and technicism.

GRAPHIC DEFINITION OF THE 3D MODEL. (INSERT TECHNICAL OR HAND FREE SKETCH. USE AS MANY PAGES AS NECESSARY.

Here you have to insert hand free sketches, technical drawings and renders (when possible), to better explain the object to be printed in 3D both as a whole and in its different parts. It is possible to size the objects to represent and dimension with the same metric scale in all their components. You can also explain through the drawings if there are components joined through technical joints.

ADDITIONAL MATERIALS FOR A BETTER DESCRIPTION: ON THIS PAGE YOU CAN INSERT PICTURES, LINKS WITH ADDITIONAL INFORMATION, VIDEOS… FOR EACH OF THE DOCUMENTS THAT WE INSERT IN THIS SECTION, THE SOURCES MUST BE PROVIDED.

In this page you can insert images, links with additional information, videos, graphics, infographics to better explain the exercise you would like to realise.

SPECIFICATION FOR FACILITATOR

HOW CAN THIS MODEL BE USED AT HOME AND IN RESIDENTIAL CARE/NURSING HOMES?

Describe in detail the use of the model printed in 3D in the work field. What is the scope about the use the object developed and what goals are intended to be achieved through this type of 3D printed object.

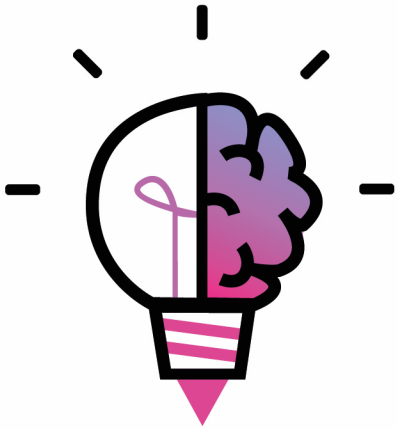
WHAT BENEFITS CAN BE OBTAINED WITH ITS USE?

Describe the benefits that people with Alzheimer and elderly people with dementia can take from the use of 3D exercise.

TECHNICAL SPECIFICATIONS OF THE MODEL

TECHNOLOGY	Here, it must be specified the kind of 3D printing technology to be used. The main types are: FDM, SLA, SLS…
IF YOU HAVE A PRINTER, WHAT MODEL IS IT?	Please add the brand of the machine you are using for printing the product.
MATERIAL	Specify what kind of material you are going to use, not only the geneal category, for example: plastic, metal, ceramic but oalso the type. For sure you will use FDM technology, and the most used materials are PLA and ABS.
COLOUR (ONE PIECE ONE COLOUR)	Please insert the color that you want the model. It is highly recommended to choose just one color per piece (and for 3D job).
SUITABLE DIMENSIONS FOR ITS USE IN THE CLASSROOM (MM)	Here, it must be specified the necessary size of the object or model. You can indicate very general dimensions, such as length, height, width (x, y, z). Or it is also possible to give more specific dimensions, like diameters, thickness, or the size of more specific parts of the object. It is recommended to indicate the measures in millimeters. On this part it is also convenient to consider the printing bed size. This will restrict the size of the object to print.
SHOULD THE PIECE BE RESISTANT OR BE SUBJECTED TO STRESS?	Please, here indicated by using “yes” or “no” if the object is going to be used in a way that it is necessary to be resistant. This will happen in some cases, such as when the

	piece is supposed to hold charges, forces, etc.
SHOULD IT BE PRINTED DURING MEETING WITH PERSON WITH DEMENTIA, BEFORE OR AFTER?	It also must be specified if the object or objects must be printed during the learning and therapeutical session, before or after. This will impact on the necessary printing time. If it is necessary to print the object during the session, the printing time should be reduced. If the object can be printed before or after the session, the 3D printer can stay printing, and the printing time will not be important.
DO YOU HAVE TO PAINT THE MODEL?	In this part, it must be described if the model must be painted after being printed.
NUMBER OF PIECES OF WHICH THE MODEL IS COMPOSED:	Sometimes, a single exercise may be composed by more than one piece. Here, this information must be indicated.
ENSEMBLE TYPE IF NECESSARY (SLOT, CLIP, SCREWED ...)	In this part you should indicate if the model is composed by several pieces, that must be ensembled and specify the way on how to ensemble them.
ACCURACY AND DEFINITION REQUIRED. (QUALITY) LOW, MID OR HIGH.	Finally, the required quality of the printed part must be indicated by means of 3 levels: low, mid or high. The quality or accuracy of a 3D printed object, talking of FDM technology, can be reflected in the visual aspect, among others.



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