

Erasmus+ KA2 SOFIA: Strategies to strengthen executive Functions In Adults

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Intellectual Output 1, Activity 5:
Handbook on the characteristics and the needs of adults with
Executive Function Disorders (EFD) certified and/or not certified

Name of the project: 'SOFIA: Strategies to strengthen executive Functions In Adults'

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Abstract

The **SOFIA - Strategies to strengthen executive Functions In Adults** - project focuses on enhancing EXECUTIVE FUNCTIONS within adult population. The term of Executive Functions (EF) refers to the mental processes that control other brain processes and enable us to plan, focus attention, remember instructions and juggle with multiple tasks. In other words, EF can be defined as an air traffic controller. The air traffic control helps controllers to direct aircraft on the ground and through controlled airspace and provide advisory services to aircraft in non-controlled airspace. The aim is to prevent collisions, organise and control the flow of air traffic, to provide information and other support to pilots. Executive Functions - in the same way - help people to regulate the flow of information, to pay attention, to plan ahead, to remember important things and to follow rules. Adults encourage air traffic control skills by establishing routines, modelling social behaviour, creating and maintaining supportive and reliable relationships.

The SOFIA project plans the organisation of a survey to understand which Executive Functions Deficit (EFD) can be identified among adults. The five following executive functions were investigated:

- **Inhibition:** it is a process that allows adults to interrupt unsuitable actions to reach an objective goal. It is thanks to inhibitory control that it is possible to control one's attention, the behavior, the thoughts to ignore an inappropriately stimulus for a task we are doing at a moment.
- **Attention:** it is configured as a process that allows an adult to focus on one or more important aspects and involves a filter linked to his/her experience. For example, attention can be divided into: ***selective attention***, that is focusing on the only information that is useful to put us in terms of a given task; ***divided attention*** that is focusing one's attention on different things deriving a benefit; ***sustained attention*** focusing on a certain thing for a long time.
- **Working memory:** it is the function that allows us to store, for a certain period, all the necessary information, processing and manipulating to connect past and present.
- **Shifting:** it is the ability that allows us to adapt to a new situation respecting the changes that occur externally to an adult involved in a specific action. In this case, the adult modifies his/her behaviour according to the various feedback so he/she can change strategies and actions to cope with new situations

The survey involved 104 adults (42 men and 62 women) and 34 teachers (14 men and 20 women) working in adult education. Our methodology included the administration of questionnaires in order to collect more quantitative data and the organisation of focus group in order to receive qualitative feedback. The analysis of the results highlighted that the adults interviewed referred that the two main Executive Function Deficits (EFD) are related to working memory and emotional management. Working memory and emotional management have significant higher scores than the other three EF. Regarding working memory, most of the interviewees reported that they have difficulty in sequencing different work process, difficulty in understanding before and after and inability to organize work by completing it (these were some of the questions of the quantitative questionnaire). Regarding emotional management, adults explained that intense emotions tend to dysregulate their behaviour.

On the other hand, trainers reported that the most defective Executive Function they have noticed in their courses/ when working with adults is the **organization of one's job**, is a lack or incapacity of ordering and prioritizing of work processes at various levels. Adults work organization is closely connected to time management, to listing of priorities and to the inability “to transfer the necessary resources for the fulfilment of one's work in time and space”.

Introduction

The present handbook gives an account of the data analysis made from the administration of questionnaires and the organisation of local focus groups with adults with Executive Function Disorders (EFD) certified and/or not certified and professionals working with adult people. This report highlights the main difficulties expressed by our two target groups and provides guidelines for the SOFIA project partners to strengthen Executive Functions (EF) in adults.

In order to build personalised paths for adults it is fundamental to give voice to the real beneficiaries. This is the main idea of this partnership as project organisations think that only by understanding and by listening to the beneficiaries, the outputs of the project will be really useful for them as they have been built taking into account their real needs. The purpose of the project is a preventive ones, aimed at reinforcing the inner strengths of adult people in order to help them regulating their emotions, learning how to organise their lives, improving the ability to maintain concentration on a particular objective (external or mental) or behaviour while resisting any distracting stimuli, understanding how to self-monitor one's own behaviour and emotions, and better perform in their daily lives (families, work etc) maintaining the preference for long-term objectives and those associated with greater rewards when confronted with immediate rewards.

1. The SOFIA project

The SOFIA - Strategies to strengthen executive Functions In Adults - project focuses on enhancing Executive Functions (EF) of adult population. EF have recently occupied a central position in studies related to the improvement of adult conditions, after the new acquisitions in neuroscience and neuropsychology. The term of 'executive functioning' has become a common buzzword in psychology offices and this is more than just a passing fad. In fact, neuropsychologists have been studying these skills for many years and it is believed that the focus on executive functioning represents a significant advancement in our understanding adults and their unique profile of strengths and weaknesses.

According to recent studies, it is clear that in order to help adult people to acquire new skills, trainers should develop custom-tailored courses and they should consider that adult learners often have to cope with specific issues and challenges. In fact, they often lack the ability to hold information in mind for the purpose of completing a task, to shift from one situation to another, to think in a flexible way. Planning and organising one's work and manage current and future-oriented tasks requires the ability to ensure emotional control.

The general objective of the project is to enhance, strengthen, develop executive functions in adults in order to be equipped with abilities that are necessary to acquire new skills that are needed to find better jobs and improve their life prospects, as help them to be more integrated in the labour market and in the society, by enhancing their personal and professional skills and competences.

The specific objective includes the development of innovative methods and tools that enable adults to be more effective and to improve their competences. The project will involve two main categories of target groups that include:

- adults: project partners will involve around 100 people with Executive Function Disorders (EFD) and adults with poor executive functions but without specific formal recognition and that represent the majority of the adults;
- educators/trainers/counsellors who work with adult with Executive Function Disorders (EFD) and adults with poor executive functions but without specific formal recognition. of whom the project will involve approx. 20 professionals.

The SOFIA project plans the development of 4 Intellectual Outputs. The present document is the final version of the first intellectual output. It consists of a handbook on the needs of adult population in relation to the executive function disorders. The second intellectual output is a Toolkit of Methods for developing/enhancing/improving executive functions in adult population, constructed by the partnership on one hand, according to a revision of the state of the art in International scientific literature and especially focusing in the research produced in partner countries, and on other hand, according to characteristics and needs of the adults with EFD identified in handbook. Based on the findings and conclusions reached by the Intellectual Output 1 (Report on the needs of adult population in relation to the executive function disorders) and Intellectual Output 2 (Compendium of Methods for developing/enhancing/improving executive functions in adult population), a



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program with specific techniques focusing mostly on self-monitor/control, working memory and task monitor will be developed and later tested within Adult Education Training Providers. The fourth IO will include a program based on several strategies, exercises for improving three of the basic Executive Functions: working memory, emotional management and planning/organisation.

The SOFIA project results shall lead to improving and enhancing teachers' and trainers' tools in use to help adults improve attitudes and behaviours, increase their attention control abilities, inhibitory control, cognitive flexibility, social and life skills, enhance their motivation to learn, deepen their commitment to acquire new skills and increase their competences.

2. Theoretical background

Executive Functions (EF) are defined as the set of cognitive skills used in reasoning and in new or changing problem solving situations. Historically, research about EF was derived from the analysis of damage to the prefrontal cortex. A precise definition is given by Wise, Murray and Gerfen (1996 p. 325): 'Lesions of PF in humans yield a constellation of neuropsychological deficits that have been described variously as difficulties with planning, concept formation, abstract thinking, decision – making, cognitive flexibility, use of feedback, temporal ordering of events, fluid of general intelligence and monitoring one's own action'.

Continuing with the description of EF features, an alternative approach consists of: 'inhibitory control, and attempt to explain various behavioural deficits in terms of this aspect' (e.g., Carlson, Moses, & Hix, 1998; Dempster, 1992). Another alternative point of view suggests that 'Executive function refers to a cognitive module consisting of effector output elements involving inhibition, working memory, and organizational strategies necessary to prepare a response' (e.g., Baddeley, 1996; Norman & Shallice, 1986).

EF can also be interpreted as the sequence of activities that lead us to a goal, a sort of brain's air traffic control center. The person in charge of the air traffic control has to safely, quickly and effectively manage dozens of flights into and out of an airport with multiple runways and terminals. It is the same with our brain. Executive functions are the processes related to cognitive and metacognitive areas that make physical and emotional self-control possible and allow people to reach their aims. They include the ability to



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maintain concentration on a particular objective or behaviour while resisting any distracting stimuli, to self-monitor one's own behaviour and emotions, to voluntarily regulate emotions and inhibit impulsive behaviour, to maintain the preference for long-term objectives and those associated with greater rewards when confronted with immediate rewards and to flexibly organise behaviour with regard to the observed ongoing outcomes of one's own actions.

Sholberg explains that executive functions are a series of cognitive processes that are made up of anticipation, goals, planning, choosing an action, self-control, memorization, and feedback. They are everyday activities like getting to work on time, plan effectively the work day in order to accomplish all the duties of the day, to define the different steps to carry out the activities and meet the deadlines.

Although EF have already been studied by neurologic research, the research has focused on analysing various aspects included in psychological development and psychopathology only recently.

Here are the focal points of scientific research:

- EF are already present in the first development of the child, probably at the end of the first year
- the development of EF occurs already between 2 and 5 years' old
- another important change occurs at 12 with a significant development of EF
- however, other changes occur in adulthood
- Executive Functions Deficits (EFD) can start at various ages
- identifies a problem, studies possible solutions, evaluates and plans their executions and, finally, puts into practice what he/she has planned.

Some adults may have learned tricks or strategies to help them do their tasks and meet their deadlines e.g., while others due to their poor executive functions could not do. As a result, they may have lost their jobs for not meeting deadlines, they can sometimes experiment loneliness because they could have lost their friends as they are not able to manage their emotions or poverty because they are not able to organise their financial expenditure.

How can we improve our executive functions?

Neuroplasticity is the capacity of the neurons and neural networks to change their connections and behaviour in response to new information. This neuroplasticity is what allows us to create new neuronal connections in our brain by learning new activities and behaviours, ultimately making daily tasks easier. It makes it possible for us to improve our executive functions, which can help us be more efficient when carrying-out daily tasks.

3. Our methodology

The methodology chosen by the Sofia partnership is a participatory one that intends to empower beneficiaries who are the key points of all the activities of the project. The activities and the outputs of the project will be built taking into account this philosophy, so that the beneficiaries will be involved in all the strategic phases in order to produce and develop customized products and outputs. Sofia project partners worked since the planning activities on the needs highlighted on adult population: the need was the starting point of the project. The more concrete the needs are, the more effective and promising the results are. For a project to be successful, the needs of the beneficiaries have to be clearly analysed and understood for appropriate planning to take place. In order to collect data and information on beneficiary needs, a questionnaire was used to collect data from adult beneficiaries and trainers, teachers, educators and focus groups were organised with adults and with teachers, trainers, educators to collect their personal opinion, suggestions, comments and specific requirements. A participatory approach enables beneficiaries to play an active and influential part in decision which affect the results of the project. This means that people are not just listened to, but also heard and that their voices shape outcomes and lead to more effective outcomes and longer lasting behavioural changes.

4. Characteristics of the sample: adults and educators

This survey foresaw two different methods to collect data: a more quantitative research method which includes mainly questionnaires and a more qualitative research method which includes the organisation of focus groups with both beneficiary groups (adult and professionals which are mainly teachers, trainers, educators etc).

The questionnaires were given both to adult who are involved in courses or training activities of the partner organisations and also to their teachers, tutors, coordinators of training activities. A total of 138 questionnaires were administered: 104 to adult with EFD certified and not certified and 34 to the professionals. The distribution of the questionnaires concerned all the partners of the project is presented below:

- Civiform (Italy): 25 adults and 6 professionals
- IFRTS (France): 15 adults and 5 professionals
- ISON PSYCHOMETRICA (Greece): 10 adults and 5 professionals
- Danmar Computers LLC (Poland): 15 adults and 5 professionals
- BEST Institut GmbH (Austria): 15 adults and 3 professionals
- VHS CHAM (Germany): 12 adults and 5 professionals
- UNIVERSITATEA PETRU MAIOR (Romania): 12 adults and 5 professionals

Together with the questionnaires whose main aims was to collect quantitative data, organising local focus groups enabled us to complete the information regarding EFD and to collect more qualitative data. During the focus groups, adults and professionals were asked also to fill in a table with a list of suggested life situations helpful for developing tools in order to improve executive functions. These short descriptions of scenarios for tools are particularly interesting as they are provided by the people that are supposed to use them and in this sense, they probably better meet their needs.

The purpose of this survey is to gather information on a series of different variables related to executive function deficits and in particular the attentional deficit, working memory, impulsivity, organization and emotional management.

Personal data analysis

People involved in the survey were adults and professionals. The participating sample can be described as follows:

Adults

Gender

| Partner involved | Male | Female |
|---------------------------|-----------|-----------|
| Civiform | 4 | 21 |
| IFRTS | 12 | 3 |
| ISON PSYCHOMETRICA | 1 | 9 |
| VHS CHAM | 8 | 4 |
| UNIVERSITATEA PETRU MAIOR | 3 | 9 |
| BEST Institut GmbH | 7 | 8 |
| Danmar Computers LLC | 7 | 8 |
| Total | 42 | 62 |

Age of Adults

| Partner involved | 18-25 | 25-35 | 36-45 | 46-63 |
|---------------------------|-----------|-----------|-----------|-----------|
| Civiform | 10 | 6 | 5 | 4 |
| IFRTS | 4 | 5 | 1 | 5 |
| ISON PSYCHOMETRICA | 2 | 4 | 2 | 2 |
| VHS CHAM | 0 | 1 | 3 | 8 |
| UNIVERSITATEA PETRU MAIOR | 1 | 3 | 5 | 3 |
| BEST Institut GmbH | 5 | 8 | 1 | 1 |
| Danmar Computers LLC | 2 | 6 | 7 | 0 |
| Total | 24 | 33 | 24 | 23 |

Employment condition

| Partner involved | Employed | Unemployed | Unemployed for one year | Unemployed for more than one year | Unemployed for more than two years | Unemployed for more than three years |
|---------------------------|-----------|------------|-------------------------|-----------------------------------|------------------------------------|--------------------------------------|
| Civiform | 1 | 20 | 1 | 0 | 1 | 2 |
| IFRTS | 0 | 14 | 1 | 0 | 0 | 0 |
| ISON PSYCHOMETRICA | 3 | 6 | 1 | 0 | 0 | 0 |
| VHS CHAM | 0 | 1 | 1 | 4 | 0 | 6 |
| UNIVERSITATEA PETRU MAIOR | 1 | 11 | 0 | 0 | 0 | 0 |
| BEST Institut GmbH | 8 | 3 | 2 | 0 | 2 | 0 |
| Danmar Computers LLC | 3 | 9 | 0 | 2 | 1 | 0 |
| Total | 16 | 64 | 6 | 6 | 4 | 8 |

Length of education

| Partner involved | 1-8 years | 9-13 years | 13-17 years | 17 and more years |
|------------------------------|-----------|------------|-------------|-------------------|
| Civiform | 2 | 15 | 7 | 1 |
| IFRTS | 0 | 7 | 7 | 1 |
| ISON PSYCHOMETRICA | 0 | 3 | 6 | 1 |
| VHS CHAM | 1 | 7 | 3 | 0 |
| UNIVERSITATEA PETRU MAIOR | 1 | 1 | 10 | 0 |
| BEST Institut GmbH | 1 | 14 | 0 | 0 |
| Danmar Computers LLC | 2 | 8 | 1 | 4 |
| TOTAL | 7 | 55 | 34 | 7 |

Status

| Partner involved | Married | Single | Divorced | Widow | In a relationship |
|-----------------------|---------|--------|----------|-------|-------------------|
| Civiform | 8 | 7 | 1 | 0 | 9 |
| IFRTS | 4 | 7 | 0 | 0 | 4 |
| ISON PSYCHOMETRICA | 3 | 6 | 1 | 0 | 0 |
| VHS CHAM | 1 | 7 | 2 | 0 | 2 |
| UNIVERSITATEA | 8 | 3 | 0 | 1 | 0 |



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|----------------------|----|----|---|---|----|
| PETRU MAIOR | | | | | |
| BEST Institut GmbH | 6 | 5 | 0 | 0 | 2 |
| Danmar Computers LLC | 9 | 3 | 2 | 0 | 1 |
| Total | 39 | 38 | 6 | 1 | 18 |

Professionals

Gender

| Partner involved | Male | Female |
|---------------------------|------|--------|
| Civiform | 3 | 3 |
| IFRTS | 3 | 2 |
| ISON PSYCHOMETRICA | 0 | 5 |
| VHS CHAM | 3 | 2 |
| UNIVERSITATEA PETRU MAIOR | 2 | 3 |
| BEST Institut GmbH | 1 | 2 |
| Danmar Computers LLC | 2 | 3 |
| Total | 14 | 20 |

Work experience

| Partner involved | less than one year | from 1-3 years | from 4-6 years | over 6 years |
|---------------------------|--------------------|----------------|----------------|--------------|
| Civiform | 0 | 0 | 1 | 5 |
| IFRTS | 0 | 1 | 1 | 3 |
| ISON PSYCHOMETRICA | 0 | 1 | 1 | 3 |
| VHS CHAM | 0 | 3 | 0 | 2 |
| UNIVERSITATEA PETRU MAIOR | 0 | 1 | 1 | 3 |
| BEST Institut GmbH | 0 | 2 | 1 | 0 |
| Danmar Computers LLC | 0 | 1 | 1 | 3 |
| Total | 0 | 9 | 6 | 19 |

Professionals' experience in working with EFD individuals

| Partner involved | yes | no |
|---------------------------|-----|----|
| Civiform | 0 | 6 |
| IFRTS | 0 | 5 |
| ISON PSYCHOMETRICA | 0 | 5 |
| VHS CHAM | 0 | 5 |
| UNIVERSITATEA PETRU MAIOR | 0 | 5 |
| BEST Institut GmbH | 1 | 2 |
| Danmar Computers LLC | 0 | 5 |
| Total | 1 | 33 |

5. Main results

a) Adult results - Qualitative data - questionnaire

The results of the data analysis collected through the questionnaires highlight that adults think their most problematic EF deficits come from **working memory** and **difficulty with emotional management**. Working memory and emotional management have significant higher scores than the other three scales. Adults highlight these two EFD as the most important for them, as it seems that they have difficulty in holding information and managing emotion.

Working memory refers to the capacity of holding information in our mind at any one instant. The root of age-related cognitive decline may refer to a reduced ability to ignore distractors. A recent study shows that older adults put more efforts into focusing in order to compensate the decreased ability to hold information in working memory. In its article *'How to improve Your Working Memory and Attention'* Dr. Tali Shenfield confirmed that working memory is one of the first cognitive functions to decline as we age. When working memory is weak, it is difficult to stay focused, ignore distractions, plan our next steps, remember instructions and start/finish tasks. Working memory deficit affects also other abilities as verbal ability (as example find the proper word to express themselves) and the ability to commit new information to long-term memory storage. Adults reporting that their working memory is not functioning as well as in the past are probably just experiencing cognitive overload. In order to reduce cognitive overload, it is necessary to delegate some of the memory tasks to a calendar, electronic schedules, written reminders and other organisational support. Moreover, it must be important to train adult minds to not think about the tasks people are not currently doing. In fact, cognitive overload can happen when people feel worried or upset. In recent years, revolutionary research in neuroplasticity (Doidge et al., 2007) showed that the various brain functions can be trained and strengthened with carefully prescribed rigorous mental exercises (Klingberg et al., 2002).

Difficulty with emotional management is the second EF that has been reported by the interviewees. Effective emotional management affects cognitive competences. In fact, when our emotions are so intense that we become dysregulated, our cognitive function will not work at full capacity. According to scientists, emotions can be a scary thing for



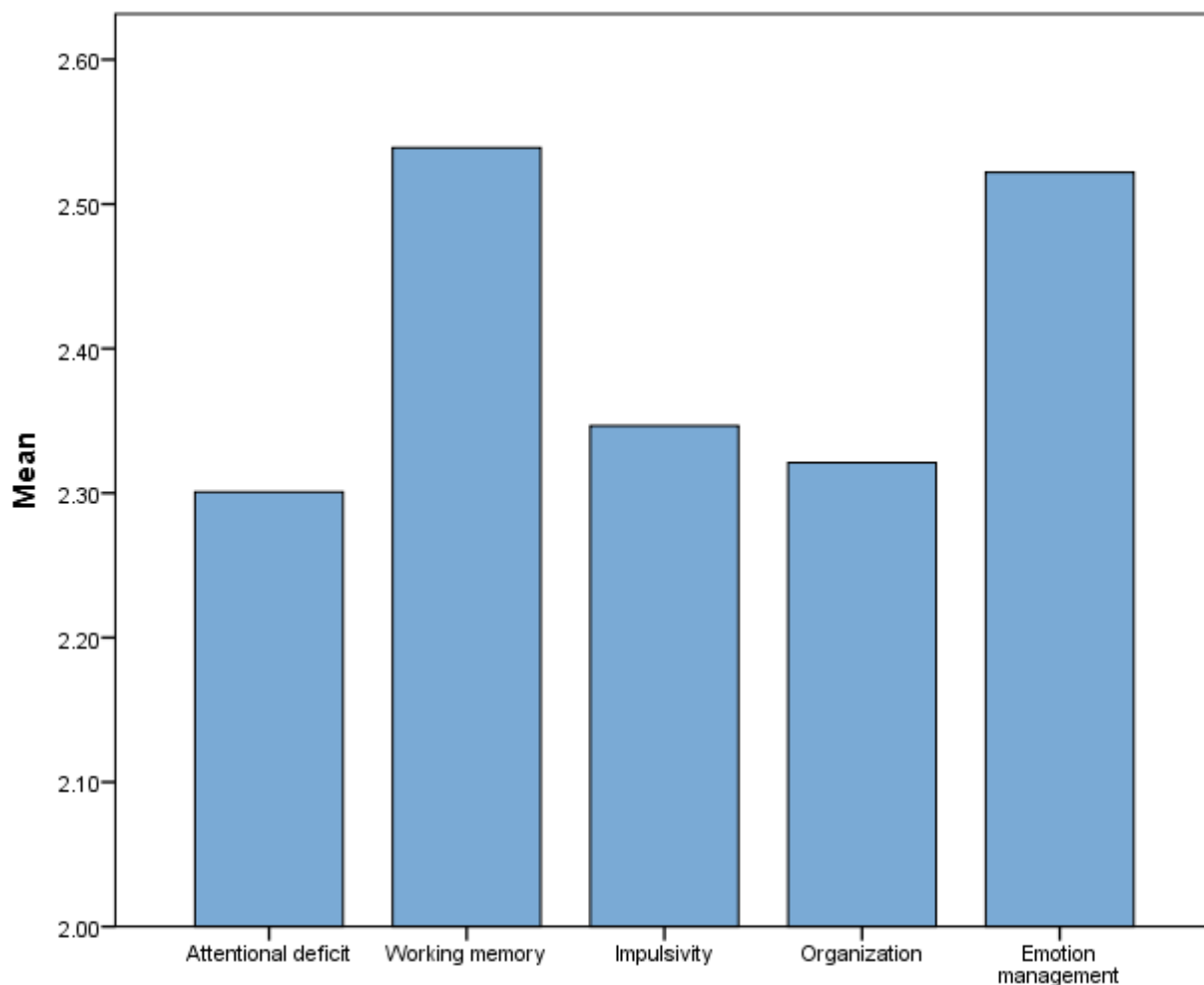
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adults and this mainly depends on the fact that they sometimes do not know what to deal with them. Identifying emotions is the first step on learning how to cope with emotions.

The graphic below shows the score adults provided to the five EF skills.



Graph 1: Sample of distribution on five EFS

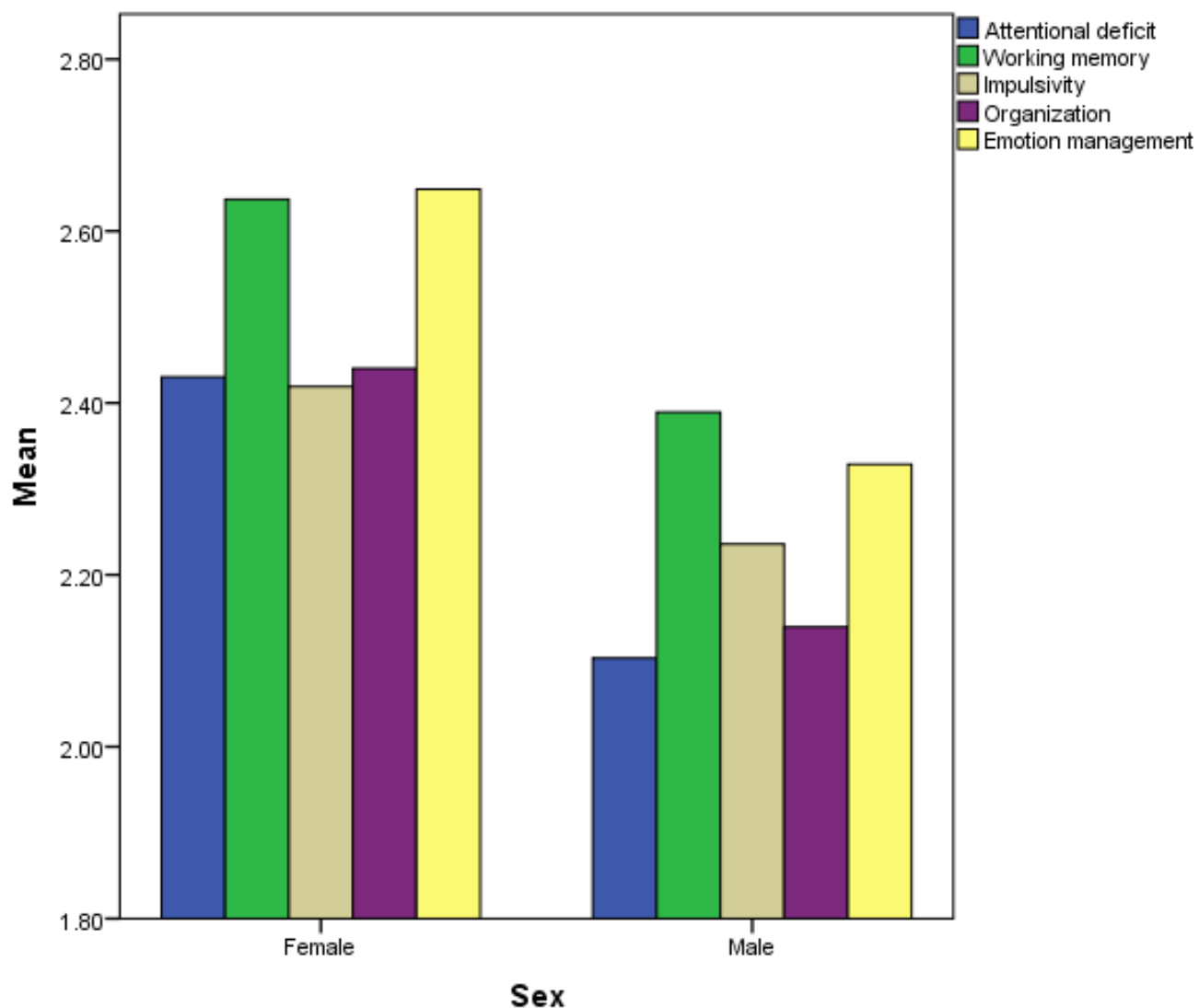
Taking into account the gender, females reported greater problems than males. Males scored higher in working memory in relation to the other EFD (see graph 2).



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Graph 2: Distribution of gender on five EFS

Comparing the data of the different Countries represented in the project partnership, adults from Greece and Romania manifested greater deficits than the rest of the respondents in Austria, Italy, France, Poland. The reason for this is that the Greek and Romanian partners involved adults with high executive function deficits, but the other project partners mainly involved adults enrolled in vocational training centres, so adults who can present executive function deficits without any certification.

Regarding the **attentional deficit scale**, the graph highlights that the two items that seem most problematic are: "to switch from doing one thing to another" and "to forget aspects of daily activities" such as returning phone calls or paying bills. Regarding the **working memory scale**, this is one of the most problematic EFDs and the most problematic items that were highlighted by the interviewed adults were "requesting additional instructions when performing a task" and "avoiding tasks that seemed boring to adults". In relation to the **impulsivity scale**, two items emerged as the most problematic with significantly higher scores than the other five items: 'talking to myself in situation where control is required' and 'getting frustrated when things are going too slowly'. Considering the **organisation scale**, all the analysed items reported the same score, no item emerged as indicating significantly causing more problems in comparison to other items. **Emotional management** - EF is another one that is considered to have significant impact on daily routine of adult people. The most significant item is the one related 'having trouble with getting to sleep as my mind is going around and round'.

Analysing the distribution of the responses for each item in the scale, adults highlight that they are 'in general' or 'often' able to focus on details. It is nearly the same for the ability 'to pay attention to several tasks at a time', on which the higher scores are between 'sometimes' and 'often'. On the contrary, it seems that adults have an extraordinary ability to 'listen carefully when someone addresses them directly'; the majority of our interviewees replied that they 'always' or 'often' listen carefully. Regarding the other items such as the ability 'to successfully finish the tasks they started' and 'to easily organise their tasks or their activities' the main response was 'often'. On the contrary it seems that interviewed people have a higher score in the abilities to 'take care of their personal items', 'set their priorities correctly and easily', 'organize their tasks and activities', 'well organise things in their office and room'. Regarding **working memory**, the specific items that provide deep information on this EF are the ability 'to memorize new concepts without difficulty' (the majority of the interviewed people replied that they often have had this problems), the ability 'to forget what they intend to say if they do not say it in the right away' (the majority chose sometimes to represent this skill), the ability to 'remember easily the names of people they have met several times' (the majority of our interviewees admitted having difficulties as they just chose 'sometimes' to represent this ability).

In reference to the ability to **organise themselves**, our interviewees admitted to often need to 'request additional instructions when they needed to perform a new task'. It seems that adults need to be involved in more active and interesting activities as they usually try to 'avoid the tasks that seem to be boring/uninteresting to them'. Some of the adults admitted to 'need someone to motivate/control/guide them in order to complete their professional duties'.

Regarding the items related to the **ability 'to listen carefully'**, despite the fact that the majority of the adults scored high on the skill to 'listen to people carefully', they also admitted that they sometimes suddenly 'respond before the question is formulated'.

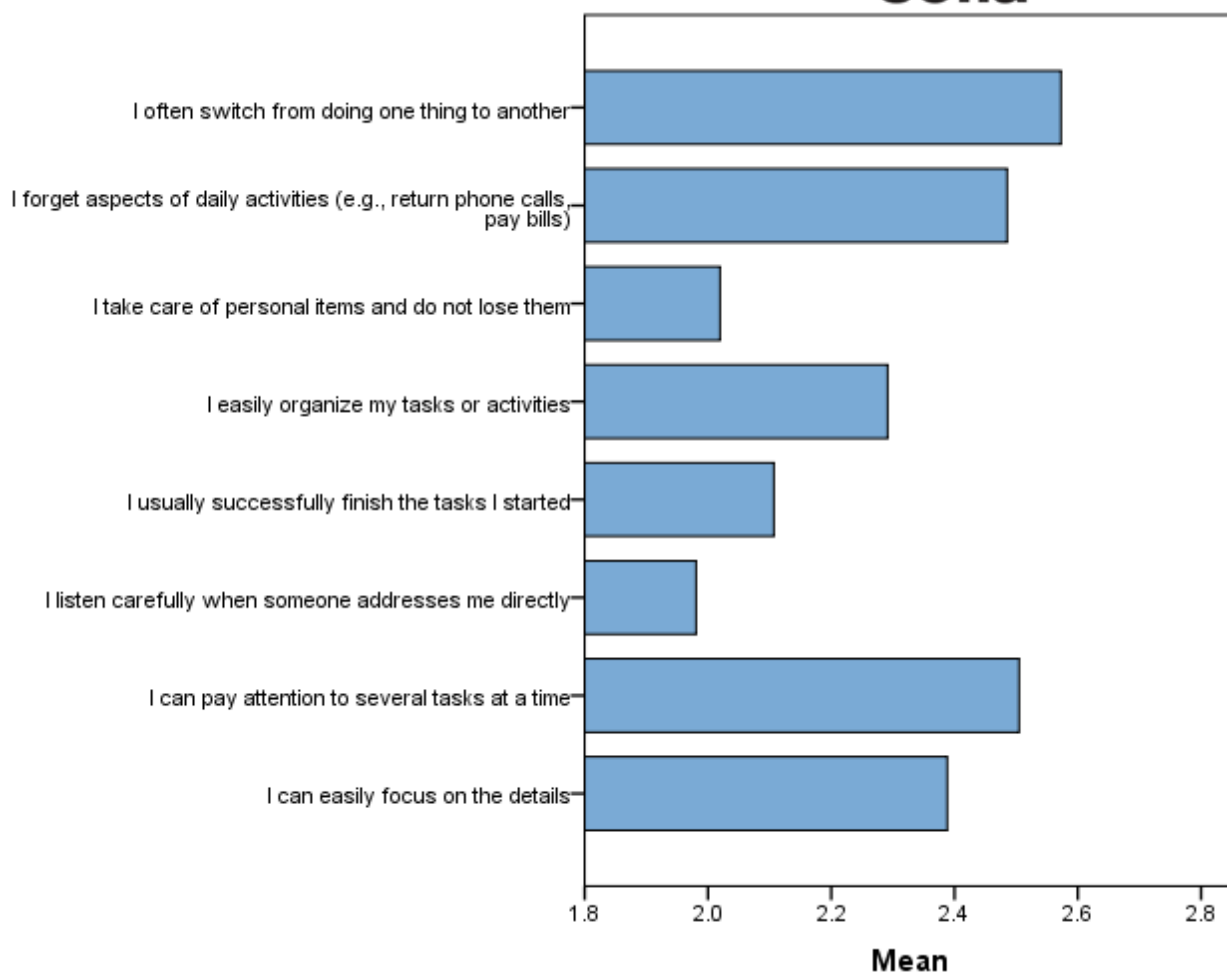
In line with the ability of **emotional management**, adults reported that they often 'react quickly to what others are doing and saying' and that they 'take impulsive decisions'. It seems that 'things have to go on quickly on the right track otherwise they tend to get easily frustrated' and they confess to 'be impatient when things are going too slowly'. Moreover, they admit 'to need to talk to them- selves in situations where higher self-control is required'.



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a) Trainers results – Quantitative data -Questionnaire

From the questionnaires filled out by the trainers, the results show that the most defective EF is **organization at work**, in other words, the lack or the incapacity of ordering and setting priorities of work processes at various levels. Organizing skills at work is closely connected to the problem of time management, to the problem to set list of priorities and the inability to transfer the necessary resources for the fulfilment of one's work in time and space. The difficulties that have been noticed are related precisely to a lack of vision of the tools/tools needed to perform a given task. For example, in training courses for cooks, you can notice how many adults in the preparation of their work station forget the necessary equipment for the performing of their tasks. This lack of organization causes a significant loss of time at work which results a lower efficiency. Therefore, the main need is to create a series of exercises / tools (list of priorities, list of mandatory steps in a given job and so on) that can help to strengthen organizational functions.

The trainers interviewed proposed the following effective ways to improve this EF:

- More frequent exercises
- Make more use of practical experiences
- Use of Check Lists
- Repetitions of work sequences in the most correct way
- Use of corrective feedback to show the correct planning sequence
- Use of video supports and images for the creation of mental concepts

The second major problem faced by trainers is related to the ability **to stay focused for short and long periods**. The ability to stay focused is necessary in any type of work in order to complete the task or be able to receive important information. The trainers have observed that part of the learners can stay focused only for short periods and, therefore, they can only partially complete a job or they forget to perform processes that are part of a given task. Then, this lack can be related to the inability to organize one's work because in order to do this, the attention must be at a maximum level. We must also add that there is a lack of mental flexibility, a lack of patience in learning, a lack of awareness of relying on attention to self-motivation in learning and low self-esteem in listening with conviction because the adult usually does not believe he can do it.

According to the responses of the educators, the most helpful methods to improve the above mentioned executive function are the following:

- Active involvement in the exercises
- Co-activity planning
- Propose challenging and non-boring tests
- Increase informal classroom situations
- More practical exercises
- Alternate various tools during lessons (video, group activities, tests, etc.)



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The third major problem encountered by trainers is **emotional control** that is an essential part of managing one's job or assigned task. What best identifies emotional control in adults is the judgment phase that conditions performance and therefore causes the adult not to accept the evaluation of their work. This problem is related to insecurity compared to the skills acquired and the ability to manage stress during work / exercises.

Taking into consideration the data collected from the trainers, the best ways to help adults in improving this deficit are listed below:

- Accustom people to stress within training
- Simulation of real life or work
- Learning by imitation or by the teacher showing a strategy to deal with a situation or multiple situations
- Using irony to play down situations of judgment
- Gathering individuals who have more emotional difficulties in peer tutoring group activities

The two last EF that are important to the **working memory and impulse control**.

Working memory is closely related to the difficulty of sequencing different work processes, difficulty in understanding before and after, poor ability to organize work by completing it, difficulty in keeping the instructions in memory, little autonomy in executing assigned tasks.

How to avoid this:

- Make people more responsible by making them more autonomous
- Intensify exercises that help improve memory
- Repeat the steps or instructions to be repeated several times
- Set a routine in the use of equipment or performing a task

Finally, Impulse control is closely related to the difficulty of **postponing the satisfaction of a need** that for the adult, in a given memento, seems impossible not to satisfy.

How to avoid this:

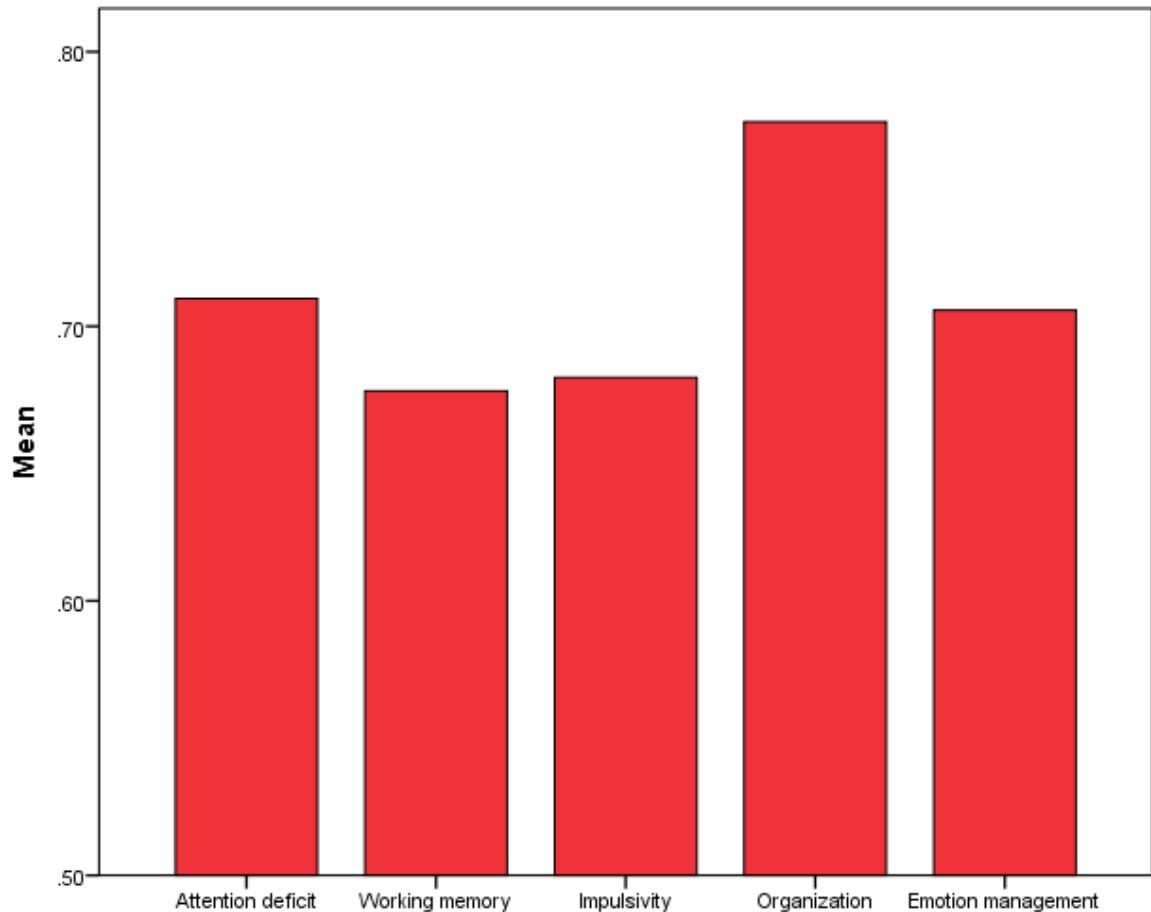
- Trying to meet the needs before an exercise or an assignment starts
- Prevent the need of the adult
- Promote movement as an activity to stimulate inhibition and self-control



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b) Adults results – Qualitative data -Focus group

Focus group is a qualitative methodology that is useful to gain an in-depth understanding of social issues and in our case of the executive functions skills of adults. The method aims to gather data from a purposely selected group of individuals that can provide interesting information regarding a specific topic. All partners of the SOFIA project organised focus group meetings with two different typologies of beneficiaries such as adult and or professionals such as trainers, teachers, educators. The facilitator wrote a report at the end of each meeting. These meetings lasted for 2 or 3 hours with the presence of a facilitator who invited participants to talk to each other in depth about the issues being analysed and sometimes an observer who helped the facilitator taking notes.



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The difficulties of adults with EFD, according to their statements, are manifested in all five areas identified, namely focused attention, working memory, impulse control, organization and planning, and emotional self-regulation. Although we noticed slight differences between respondents from different participating countries (mostly for respondents in Germany), there was still a large agreement among the majority of the respondents. Respondents asked to define certain concepts related to EFD (in Italy) provided fair answers.

Difficulties in concentrating attention:

- Difficulties concentrating attention over a longer period of time or on multiple tasks at the same time. (Poland, Romania)
- They cannot do multitasking; some try but are inefficient.
- The main identified factors of distraction by adults with DFE were: mobile phone, facebook/internet, environmental noise, (traffic, classroom), television (Romania), smoking (Germany) emotional problems (Italia).
- The tendency to say yes to several things: the reasons vary depending on countries
Germany: It is easier not to have to argue a response, Romania: I do not know how to say no

Difficulties in working memory / selective attention

- They often forget what they have to say if they cannot say it immediately (although respondents from Germany rarely report such problems)
- They forget to bring home the things they need to complete an activity or work
- They have difficulties in remembering people's names, even if they had met them several times. In Germany, only a quarter of the participants say they have such problems
- Despite efforts to be on time, they are often late at work, and also at other activities they are involved in.
- Adults, depending on their personality and the level of confidence in their own forces, when they are to perform a new task they require additional information or choose not to ask, even though they needed it. Participants from Germany, Greece, Italy ask for additional training frequently and appreciate that this is normal
- To retain new aspects, we have identified that some have effective methods (notes, call friends to remind them), follow a logical scheme in the sequence of actions, tend to automatization (Italy)
- Establish an order of priorities less effective (repeats endlessly). Romania, Italy.



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- They find it difficult to mobilize for a complex task which involves several stages of work
- They have difficulty in keeping the instructions in memory
- When a task seems boring or not interesting, most people do not get involved
- They need someone to motivate / control / direct them to complete their professional tasks except for the respondents in Germany where most do not need it

Impulse Control Difficulties

- They tend to respond before the question is formulated, to react impulsively when others act inappropriately. However, they think they are controlling these impulses. Their reaction is based on the stimulus person and the temperamental type.
- They have impulsive decisions and then want to revise the decision they had taken or they tend to postpone decision making, needing the opinion of others.
- Most do not talk with themselves when they need to be self-conscious.
- They have difficulties in controlling the reactions while driving,
- They have a need to speak, to chat
- They have a difficulty in postponing the satisfaction of a need
- They have a difficulty respecting turn-taking during a conversation

Organizational / planning difficulties

- They tend to procrastinate.
- Even if they are planning their time, they fail to follow the planning. Again, the participants from Germany represent the exception.
- They cannot accurately anticipate the time needed to carry out an activity, and they need a longer time to start a task when it is more difficult.
- High difficulty in managing large projects. Just a few adults have declared that both their room and their office are in a mess, while others claim they are in order. (Germany)
- There are difficulties in setting priorities.
- They fail to meet the deadlines for accomplishing the tasks. Exceptions are made by participants in Germany
- There are difficulties in planning activities. Exceptions are made by respondents from Germany
- Organizational / planning difficulties



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- Even if they are planning their time, they fail to follow the planning. Again, the participants from Germany represent the exception.
- They cannot accurately anticipate the time needed to carry out an activity, and they need a longer time to start a task when it is more difficult.
- The tools and strategies that could help to improve to planning (Italy)
- Establishing a time to complete a task
- Division of shares to be carried out to reach a goal
- To be realistic and concrete when you want to achieve a goal
- To have patience

Difficulties in emotional self-regulation

- When being assessed they display: stress, nervousness (Greece), worries (Italia) negative emotions.
- More than half of the respondents declare that it is difficult to hide their behavioural manifestations of emotion; It is difficult to focus on solving problems or tasks when they have a negative emotion. Exception is made by respondents in Germany who claim that if they do not happen at the same time, they can manage and complete other tasks.
- Go easily and without reason from one emotion to another.
- Some of the respondents appreciate that they are dominated by some emotion to a greater extent than the rest of the people. Others disagreed.
- The tools and strategies that could help to emotion management (Italy)
- Engaging in activities that help to not worry anymore
- Accepting the difficulties and trials that life offers
- Exercising optimism
- Making a list of the positive emotions experienced during the day as a form of training towards emotions

c)Trainers results - Qualitative data -Focus group

From the analysis of the reports, it emerges that most trainers (with the exception of Romania and Poland) have not heard about the concept of executive function deficit but only of somewhat related concepts of ADHD, autism, cognitive functions, etc. Participants in Italy, observes how the teacher's profession also include the need to involve executive functions and sometimes to dedicate moments for their empowerment. After clarifying the meaning of the concept, most have argued that



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they work and worked with this category of adults and that they make their training very hard.

The most common issues identified by trainers in the EFD adult are: concentration problems, focusing on multiple tasks at the same time, organizing, planning and completing and finalizing tasks in time, failing to manage frustration, prioritization. Also, difficulties in remembering and reminding have been identified, inability to concentrate on pregnancy during negative emotions, requesting more information to solve tasks, impulsive decisions, lack of interest, poor adaptability, difficulty of awareness of the connection between body and mind (Italy).

Among the tools used by trainers to help adults with EFD, we mention:

- Presentation of the Course Agenda at the beginning of the training session: helps trainees to meet their expectations (reasonable expectations) to dose their energy, to clarify their objectives, to automotive
- Establishment of sub-objectives with the learners
- Using contracts to complete the work
- Including small pauses/breaks
- A colour code to navigate through the study to prioritize tasks
- Following the calendar initially set
- Using the task check lists
- Planning of transition periods and changes in activity
- Using flow charts to indicate the steps in a task
- Using notebooks, planners to record information
- Sequencing must come from the trainer's attitude
- Interactive teaching methods and the use of various tools to facilitate the training session (speech, diagrams and images, videos, podcasts ...)
- Creating an appropriate learning environment (considering light, temperature, visual and hearing stimuli...)
- Asking for frequent feedback from learners about learning contents

The useful tools that an EFD adult can help are:

- Google Calendar or iCal for time management (or any similar software)
 - Annex 30/30 (for Apple devices - free) for time management
 - TToodleDo (for Android) for organizing task lists and prioritizing tasks
1. The main reasons for distraction, noted by trainers, during activities are: Phone, facebook, ambient noise (discussions among other participants, street noise) task irrelevant visual stimuli (e.g., objects on the walls, too intense colours), dysfunctional negative emotional states, depression, anxiety.

2. Most investigated trainers agree that DFE adults are not multitasking people
2. The trainers use the following strategies to keep the learner's attention on a task:
 - Frequent breaks - (at 45 -50 Min)
 - Interactive activities
 - Practical Apps
 - Tasks presented auditory and visually
 - Appropriate motivation (focusing on the immediate needs of personal and professional life)
 - Co-design of their training
 - Challenging and not boring tests
 - Increasing informal situations outside the classroom
4. The tasks / activities that most adults with EFD most often focus on are: practical activities, individual activities in the form of games, interesting and fun activities, light, relaxing.

Working memory

1. They need additional information but do not all ask for it. There are differences due to the severity of the deficit, the temperamental type, the self-confidence, the culture they come from (have been or are not accustomed to asking for help)
2. When boring tasks are proposed, most are disinterested, bored, not involved, tend to postpone the task or abandon it.
3. Learner motivation strategies used by trainers to carry out the task are:
 - Step-by-step approach with immediate gratification
 - Providing students with personal benefit
 - Competition and reward
 - Providing positive feed backs in front of the group
 - Previous successes
 - Certificate

Impulse Control

Answers given by the interviewed trainers have shown that it depends very much on the type of personality. For this reason, their answers have been divided. Some participants appreciated that adults with EFD are talking a lot, responding before finishing the question, taking impulsive decisions and reacting negatively when challenged. There were, however, some participants (about one-third) that claimed the



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opposite point of view. The tools and strategies could help adults to improve their impulse control: (Italy) satisfying the needs before the beginning of the lesson, promoting sport activity to stimulate inhibition, modulation and self-control, meeting the student's needs.

Organization / planning

1. Adults with EFD have difficulty in organizing, planning, meeting the deadline when the task they have to solve is difficult or complex (they do not have the patience to finish, they cannot concentrate until the end, they are lost in the process, they cannot follow the planned steps).
2. Most have time management difficulties, are lost in details, postponing a task. Some trainers have appreciated that adults with EFD do not consciously delay tasks solving but do not know where and when to start. Representatives in Germany have not fully agreed that these adults would have problems organizing, planning or finalizing on time the tasks, appreciating that they delay decision-making and hide behind their colleagues, remain the last in their presentations, and therefore have more time to complete.

Emotional self-regulation

1. In assessment situations, adults with EFD are stressed, incoherent, confused, and nervous
2. After a strong emotion, most trainees noticed that adults with EFD have difficulty concentrating on tasks. They need time to calm down or somebody to help them.
3. When they have emotions, adults with EFD have the following manifestations:
 - Confusion (for example, they do not know what to say or interpret)
 - Nervousness
 - Refusal to participate in the activity
 - Verbal aggressiveness against the authority
 - Tendency to exaggerate emotional manifestations
4. Trainers have found that they help adults with EFD control their emotions when working with:
 - Breathing exercises, chatting with friends, sports, relaxing music, painting activities, colouring, meditation, playing with a small ball or a pencil in their hands, walking, running or exercising to control emotions when appear



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- Having a small number of trainees
- Providing feedback / reward immediately after showing the desired behavior
- Performing short tasks with breaks between activities
- Eliminating or reducing noise
- Alternate the type of activity-Get used to the stress of a practical test with drama activity
- Simulation of real life or work situations
- Learning by imitation, where the teacher shows a strategy to deal with stressful situations
- Using irony to cool down moments of tension

Methodology of peer tutoring, which consists in putting together, in group activities, individuals who show greater difficulty in emotional control with individuals who show greater emotional skills.

Conclusion

What can be the future relapses to the difficulties encountered by people in correctly activating Executive Functions? Is it possible to provide useful tools or suggestions? After reviewing the results from the questionnaires and the Focus Groups, what can be the valid tools to help adults demonstrating deficit in Executive Functions? The problems associated with working memory and emotional management should often be addressed, for example in the case of training courses, through specific modules in order to create protocols for the management of these problems. It is precisely by means of the continuous preventive exercise that it is possible to accustom people to manage their emotion appropriately (not to make impulsive decisions for the future) and to exercise the working memory that often influences the organization of one's work.

- 1) **Working memory:** most of the adults interviewed reported that their greatest difficulty lies in working memory like a difficulty of sequencing different work processes, difficulty in understanding before and after and inability to organize work by completing it.

What can we do:

| | |
|-------------|--|
| First step | Getting people to be autonomous in the performance of their duties, moving from a simple task to a more complex one. We must co-construct a path made of small steps, small actions, shorts steps that can help the working memory |
| Second step | We need to intensify exercises that help developing memory such as repetitions or instructions to be repeated several times and in a short period of time |
| Third step | Setting up a routine of actions or thoughts during the course of a given task |

- 2) **Emotional management:** is the second main EFD that has been reported by the adults interviewed lies to the fact that intense emotions can be dysregulating.

What can we do:

| | |
|-------------|--|
| First step | If we are in working groups, we can learn to better manage our emotions by how other people behave to get an example; if we are attending a course and we are about to start a test, it will be the teacher who will show the most appropriate strategies to solve a problem or different problems. |
| Second step | A solution to solve the emotion management is to work in a group of individuals who cannot manage their emotions with individuals managing under pressure. In this case, people learn from their peers by looking at contact abstraction and seeing from time to time the strategies that are adopted. |

These are just some of the steps that could preventively help adults in their work and their activities. In this case it is always better to create theoretical and practical bases that can be connected to an optimal functioning of Executive Functions.