creICTivity

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# USING CREATIVITY TO SUPPORT ADULTS IN ICT EDUCATION

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**Using Creativity to Support Adults in ICT Education**

**(The creICTivity project )**

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# PREFACE

This book contains the results of the creICTivity project. The project was designed and implemented with the goal to highlight the importance of creativity in adult education and more specifically its potential in ICT education of adults.

The book is comprised of 3 parts. It starts with the methodological part entitled Using creativity to support adults in ICT education - Teaching methodology for adult educators. This part discusses creativity and provides some useful methods and approaches to foster creativity of adult students with low ICT skills.

It is followed by creICTivity learning modules and creativity enhancing games designed in line with the methodology described in the first part.

The final section is the Design Thinking Workshop Guidebook that provides instructions and materials for implementation of workshops designed to research and discover characteristics of different groups of adult students in regard to ICT education.

The book intends to motivate educators to become more aware of the usefulness of creativity in education and provides them with theoretical basis and methodological support to introduce more creativity into their educational work.

# SECTION 1: USING CREATIVITY TO SUPPORT ADULTS IN ICT EDUCATION - TEACHING METHODOLOGY FOR ADULT EDUCATORS

## FOREWORD

CreICTivity project connected six partners, Društvo DISORA (Slovenia), Učilište Magistra ustanova za obrazovanje odraslih (Croatia), NAVICULAM Sp. z.o.o (Poland), Institut für Internationale Bildungs-und Arbeitsmarktprojekte (Germany), Neotalentway (Spain) and Tokat Gaziosmanpasa University (Turkey).

The project has two main topics – creativity and ICT. ICT was the »medium« through which we tried to better understand and present the topic of creativity.

The partners share a common interest in creativity. Part of the appeal lies in its elusive nature that makes it a hard to define and somewhat mysterious quality. The rest is in its applicability in education and problem solving which makes it interesting and useful for educators of all kinds. At the same time creativity is often overlooked as a component of the educational process, especially in adult education; another reason why we decided to make it the focus of our project.

We found out that creativity truly comes in many forms and that it can be applied in most life situations. To make the often abstract concept of creativity more »tangible« and connected to the very practical skill of ICT, we decided to adopt the concept of **practical creativity**. Practical creativity is in essence the ability to be creative in solving various types of problems.

ICT was chosen for three reasons. First, it is a very relevant skill. It is actually surprising how big the digital skills gap in Europe still is: 169 million or 44 % of Europeans aged between 16 and 74 lack basic ICT skills.[21] Clearly new and different approaches for effective teaching of ICT are a welcome addition to any educator's toolbox.

Second, to low ICT-skilled adults ICT often seems like a problem to which they cannot find a solution. We approached ICT use from the perspective of a series of problems that can be (more effectively) solved if practical creativity is introduced into the learning process.

Third, ICT is a topic relevant to all project partners. Učilište Magistra, Institut für Internationale Bildungs-und Arbeitsmarktprojekte and Neotalentway as educational and training institutions will be able to use the project results and lessons learned in their regular work. The same is true for NAVICULAM and Društvo DISORA who provide ICT education to adults on a smaller scale. Tokat University is an academic institution with a lot of theoretical knowledge about creativity. They are very practically oriented and often apply theoretical knowledge in their educational centre so the project results will be useful to them from a theoretical and practical standpoint. Through them the project will reach the academic field which is not often the case with adult education projects.

Apart from improving our own knowledge about creativity and ability to use it in education, the aim of the creICTivity project was to give ICT educators an opportunity to become more aware of creativity as an element of education and look at the ICT teaching from a different perspective. We hope that by becoming more aware of the value of fostering creativity in the learning process they will be able to connect with their learners better, engage them more and achieve better learning results in the area of ICT skills and other topics.

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21      European Commission, (19. 10. 2017). The Digital Skills Gap in Europe. https://digital-strategy.ec.europa.eu/en/library/digital-skills-gap-europe

## The Partners

Coordinator: Društvo za izobraževanje in socialni razvoj



Društvo DISORA (Association for education and social development) is an NGO from Maribor, Slovenia. We provide informal education in the area of soft skills and basic skills to various vulnerable groups of population. We also focus on the development of innovative educational methodologies connected to soft and basic skills.

https://www.facebook.com/drustvo.disora



Uciliste Magistra is a privately owned, non-profit adult educational institution established in 2002 in Zagreb, Croatia, where it is also located. We are specialized in education regarding economics (eg. book-keeping education), special care for elderly citizens, young children and sports educations. We also organize various informal educational programs. We provide quality education based on the concept of lifelong learning, mobility and the development of human resources as the greatest value of society. Uciliste Magistra has participated in several EU and national projects in the last years.

https://www.facebook.com/SkolaVasegUspjeha



INIBIA is the Institute for International Education and Labour Market Projects and works since more than 25 years in international project management. INIBIA is managing European networks and develops new approaches for education, training and labour markets. INIBIA is organized as EEIG (European Economic Interest Group) with 2-5 international experts from Germany, Spain, Kosovo and France: Dieter Schulze (executive manager) and André Arnera. Other partners are temporary partners in the respective projects. INIBIA has its special competence field in developing strategies to improve lifelong learning and employability (especially for disadvantaged target groups), to find answers regarding the demographic changes and promote regional development.

http://www.inibia.eu/

NAVICULA.M is a training institution that started in 2001 as a Service Bureau for European Initiatives, which has been registered with the Provincial Labor Office in Lodz as an employment agency and certified training institution. Initially, it focused on training for the unemployed, especially for socially excluded groups. By 2018, 21,000 people had been trained. The most popular training program was ABC of small business. Those who completed the training were prepared for employment based on the self-employment model. After years of activity, the organization began to explore new forms of informal education for adults. Among other things, it began producing educational and instructional videos, educational animated tutorials, educational comics, educational smartphone games, and educational platforms. The institution works on behalf of local, state, business entities. Currently, the training courses provided are mainly for job seekers and employees of local government units and small businesses. In training, it mainly uses new Internet communication technologies for expanding forms of adult education.



Neotalentway is an educational and training consultancy that focuses on skills development, talent management, digitalisation and entrepreneurship. It is a company focused on increasing quality in all processes for maximum personal and professional development.

https://www.facebook.com/Neotalentway



Gaziosmanpaşa University is a higher education institution. It has academicians with various faculties and different skills. Gaziosmanpaşa University is an expert in developing training curricula using different methods. In this context, educational curricula and international projects that use the storytelling and design thinking methods have been prepared in our institution

https://www.facebook.com/toguresmi

# 1. Briefly about creativity

## 1.1 Creativity through history

Through history people were fascinated by creativity and tried to explain and understand it. For a long time, creativity was seen as a creative force granted to artists by some deity in order for them to create works of art. Greek philosopher Plato called it »divine madness« as it seemed to him that artists were possessed and not fully responsible for their creations. Even later artists like Van Goghg thought that some external force helped them create their art.[22]

In the middle ages creativity was more closely connected to divine creation and the term »creatio ex nihilo« or creation from nothing. Thus creativity was still seen as a trait gifted to humans by God.[23]

In the Renaissance artists like Michaelangelo and Leonardo Da Vinci started proposing that art is created by humans. This is also when artists started signing their works to show they are the creators.[24]

In the Enlightenment period philosophers like Hobbes brought creativity from the realm of religion and the divine to the domain of secularism and science by proposing that human society can make progress through the use of creativity.[25]

In the early 20th century Sigmund Freud proposed that creativity is the result of the struggle between the ego and the super ego that goes on in every person. But it seems that he still thought that creativity is reserved for exceptionally gifted individuals like Einstein.[26]

Science based research of creativity started only in the 1950s. Therefore, from a scientific perspective, creativity is a quite new and not extensively researched concept. In fact, **from 1975 to 1994 only 0,4 % of all psychological research dealt with creativity**. This tells us how complex and difficult to define creativity is despite arguably being the highest and most widely applicable human cognitive function.[27]

## 1.2 Creativity as a modern concept

Since the 1950s various scientists tried to define and measure creativity. Since then they came up with **more than 60 definitions** of creativity, showing again how elusive the concept is.[28]

Despite this diversity of opinions there are a number of characteristics of creativity that seem to be widely accepted by experts. Here we summarise the most prominent ones that in our opinion are useful for all that wish to understand creativity better and incorporate it in any way into ICT education, or education in general.

It seems that **intelligence and creativity are not closely connected** – one does not necessary need the other.[29]

Some suggest that **giftedness** connects both on some level. Creative people have the ability to establish connections between parts of the brain that are usually not connected. **Anybody can be creative on some level.**[30]

This was the starting point of the creICTivity project because it led us to the idea that creativity can be fostered and improved also in people with average or below average learning abilities. Because it is so universal it can be incorporated into any educational situation or topic.

Below are some other established observations about creativity that can be useful for educators who wish to incorporate creativity in their educational work.

**Creativity is the ability to make new connections between existing things and concepts and to see new alternatives and solutions to problems.** Creative process creates something new or unusual **but also useful**, it can be a thing, a product, an idea or a solution to a problem.[31]

22    Shryack, S. (February,2017). The History of Creativity. https://www.sari.studio/blog-1/the-history-of-creativity
23    Ibidem
24    Ibidem
25    Ibidem
26    Lehane, S. A brief history of creativity. https://www.creativejunglecompany.com/creativityblog/a-brief-history-of-creativity
27    Ibidem
28    New World Encyclopedia. Creativity. https://www.newworldencyclopedia.org/entry/Creativity
29    New World Encyclopedia. Creativity.
30    Ibidem
31    Ibidem

Characteristics of creative thinking are:

- Imagination,

- Originality,

- Innovation,

- Divergent thinking[32],

- Development of new relationships between ideas, concepts, situations etc.

This type of thinking leads to the creation of new or better ideas, solutions to various types of problems, increased efficiency or effectiveness of processes and more.[33]

Broadly speaking creativity has 2 main principles – **problem finding** and **problem solving**. This speaks to its practical use.[34]

For the creative process to occur a number of ingredients are required. The ingredients vary to a certain degree but they can be grouped in 2 sets of elements.

According to some experts the needed ingredients are:[35]

- Some level of expertise or skill (knowledge)

- Creative thinking skills (ability to use imagination and be flexible when approaching problems)

- Intrinsic motivation (interest, curiosity, satisfaction, personal challenge)


While others see creativity as a combination of 4 elements:

- Creative person

- Creative process

- Creative environment

- Creative product

It is not clear which element, if any, is the most important.[36]


Creative process can be described in 4 stages:[37]

1. Preparation: gathering information, thinking about the problem, increasing our knowledge, it's an internal and external process

2. Incubation: gathered knowledge solidifies in our mind, new ideas and connections are formed, it is a more subconscious process

3. Illumination, the Aha! moment. New ideas and connections arrive to the conscious mind from our subconscious mind.

4. Verification: here we consciously work on the new idea, finalise it and test it practically.

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32    Style of thinking that tries to find many solutions to a given problem. It is a non-linear »stream of consciousness« type of thinking, often connected to brain-storming method.
33    Ibidem
34    Nikolopoulou, K. (2018). Creativity and ICT: Theoretical approaches and perspectives in school education. Research on e-Learning and ICT in Education: Technological, Pedagogical and Instructional Perspectives, 87-100.
35    Al-Ababneh, M. M. (2020). The concept of creativity: definitions and theories. International Journal of Tourism & Hotel Business Management, 2(1), 245-249.
36    Al-Ababneh, M. M. (2020). The concept of creativity: definitions and theories.; New World Encyclopedia. Creativity.
37    New World Encyclopedia. Creativity.

## 1.3 Measuring creativity

Measuring of creativity was not the aim of the creICTivity project as this is a complex process demanding a level of scientific work well beyond the scope of the project. We however wish to present some information related to the measurement of creativity because they can offer additional insight into creativity and provide educators with some indications if any level or aspect of creativity is present in the education process.

The question how to measure creativity became relevant together with the research on creativity in the 1950s.

There are two main approaches to measuring creativity. The first one focuses on the ability to solve problems and the second one focuses primarily on psychometric characteristics, claiming that creativity is based on cognitive and affective skills and personality traits.

One of the first examples of measurement of creativity was »Divergent Thinking Test Battery.« In this method, for example, a participant is asked to draw different meaningful shapes from a circle.[38]

Torrance tests are perhaps the most famous evaluation tools for creativity. These tests are presented in two forms »verbal« and »figural«. In the verbal part, there are different parts such as the question part, anticipating the reason part, producing an idea regarding the development of a product, giving examples regarding extraordinary examples of use, and asking extraordinary questions. There are different parts for the figural part as well: shape configuration, shape completion, and changing shapes using circles and lines.

Generally, the measurement of creativity differs in terms of definition and focus reference point. However, some criteria are taken into consideration during evaluation:[39]

**1.Fluency:** This shows the total number of ideas considering a specific situation.

**2.Flexibility:** This shows the number of categories of ideas considering a specific situation.

**3.Originality:** This shows the extraordinary characteristics of the idea considering a specific situation.

**4.Detailedness:** This shows the expandability of the idea and level of detail of the idea considering a specific situation.

**5.Transferability:** This shows the level of transferability of the idea into different fields considering a specific situation.[40]

Some examples of activities regarding measurement of creativity are:

1) How many times can you use a paperclip for different purposes?

2) Considering the relationship between a pen and a computer, what item can you find with a hat to create the same relationship?

3) If you thought gravity does not exist, how would the world be? Please define.

While not very accurate, we believe that traits like fluency, flexibility, originality, detailness and transferability can be observed during the educational process, giving educators some information on the level of creativity displayed by the learners. **Awareness of these traits** of creativity can also give educators the ability to plan and conduct the educational activities in a way that will foster these traits in learners.

## 1.4 Effect of creativity on education

One of the main objectives of the creICTivity project was to highlight the importance of creativity in (adult) education.

Based on our joint experience as (adult) educators and avid observers of the field of adult education it seems that creativity is still mostly neglected in educational practices for adults.

38      Guilford, J. P. (1967). Creativity: Yesterday, today and tomorrow. The Journal of Creative Behavior, 1(1), 3-14.
39      Torrance, E. P. & Myers, R. E. Teaching gifted elementary children how to do research. Eugene, Oregon: Perceptive Publishing Co., 1962. ; Fisher, B. J. (1995). Successful aging, life satisfaction, and generativity in later life. The International Journal of Aging and Human Development, 41(3), 239-250.
40      Torrance, E. P. & Myers, R. E. Teaching gifted elementary children how to do research.

We believe that this is the result of adult education as a whole being **focused primarily on quantifiable educational results** that can be recognised in some formal or informal way.

While this is very important it is also an approach to education that does not include the concept of creativity as it is very hard to quantify. Nevertheless, there are many benefits to introducing an element of creativity to the educational process, especially given the often informal nature of adult education.

When creativity is used in the learning process it:[41]

- Engages the learners and teachers
- Improves creative potentials of the learners
- Creates more relaxed and inclusive environment
- Improves learning outcomes and retention of knowledge

This makes the educational experience more rewarding for all involved. The knowledge gained is more useful in real life. Learners and teachers become more creative and are able to use their creativity in everyday situations outside the classroom.

Learning with elements of creativity is **developmental and self-fulfilling education**. It develops new skills and knowledge but also attitudes needed for coping with difficult (learning) situations.

Fostering creativity in education **gives purpose to learning** because it makes adult learners more receptive to new ideas and possibilities, to try out new things and react more appropriately to changes in their environment.

Creativity is closely connected to **higher-level thinking processes** like **critical thinking, critical reflection and analysis of information**. These processes don't necessarily need creativity to occur but they are enhanced by creativity and vice-versa.

## 2. Fostering creativity in education

In this chapter we present the most important ingredients needed for fostering creativity in the classroom. We use the term »ingredients« because they seem like the best common term for the mix of conditions that need to be met, methods to be used and attitudes to be displayed. At the same time the term ingredients points to the elusive nature of creativity.

The ingredients described were selected and adapted from the perspective of the creICTivity project but are nonetheless relevant for fostering creativity in any educational situation.

## 2.1 Basic building blocks of creativity in learning

Adults like **to build their own knowledge** through enjoyable learning process. To foster creativity, the learning process must be **simulative and involving**. This allows them to enjoy new (learning) experiences through exploration, deduction, analysis, synthesis, generalisation, abstraction and concretization.

They are able to build and redefine concepts and meanings through the prism of their personality which leads to creative learning and thinking processes. Learning is most effective if learners are involved in the process. To achieve their involvement, we must understand their motives, attitudes and goals.

In order for the learning process to foster creativity the learners must be able to:

- **Express your views, obstacles etc.**
- **Co-create learning content or process**
- **Formulate the problem before reaching the solution (defining or understanding a problem can even be more important than solving it)[42]**

41      Oprea, C. L. (2014). Interactive and creative learning of the adults. Procedia-Social and Behavioral Sciences, 142, 493-498.

42      Nikolopoulou, K. (2018). Creativity and ICT.

These 3 main factors depend on 3 components. They are listed in order of importance:

**1. The teachers teaching style and direction**

**2. Motivation and engagement of adult learners**

**3. The learning environment[43]**

The goal of a learning process that aims to foster creativity should be to maximise each of the three components. It is, at the same time, hard to say when they are sufficiently fulfilled as every learning situation, every group of adult learners and every teacher are different. The good news is that **creativity is** – for lack of a better word - »resilient« and can be fostered even if learning circumstances are not ideal. A skilled teacher, aware of the nature of creativity and its signs in learners, will be able to pick up on even the smallest creative impulse in the classroom and use it to improve the quality of the learning activity.

Another important factor that should be promoted through learning and must be mentioned is **divergent thinking**. Divergent thinking is flexible and original; it produces multiple ideas leading to solutions of various problems.[44]

Because now we know that creativity is not exclusive to exceptionally gifted individuals, perhaps the best way to foster creativity is to approach it like a skill. **Creativity is in essence a skill** because it can be stimulated and improved with certain methods and exercises under the guidance of a teacher with necessary skills and motivational attitude.

## 2.2 The approach
The three components described above are brought together with the right approach. **Creative Problem Solving model (CPS)** is recognised as the most effective approach for conducting creative learning in the classroom. The model consists of 7 steps:

1. Clarify and identify the problem

2. Research

3. Formulate creative challenges

4. Generate ideas

5. Combine and evaluate ideas

6. Draw up a plan of action

7. Implement your idea[45]

The model fits the goals of creICTivity well but it is also very general, allowing educators and learners to tackle different types of problems.

## 3. Creativity and creICTivity

## 3.1 Motivation for creICTivity
How did the idea to merge ICT and creativity into creICTivty came to be? During our educational work with adults we noticed that a portion of them does not have even the basic ability to use ICT daily for tasks like storing and organising data, communication, sending and receiving content, navigating websites and more. We consider these skills to be the basis of independent ICT use.

We observed that adults face a number of obstacles when they try to learn how to use ICT. There are different contributing factors: age, internal motivation, external motivation, aversion to new technology, general literacy, often negative educational experiences, preconceptions about one's own abilities, lack of learning

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43      Tsai, K. C. (2013). *Two channels of learning: Transformative learning and creative learning. American International Journal of Contemporary Research, 3(1),* 32-37. ; Nikolopoulou, K. (2018). *Creativity and ICT.* ; Oprea, C. L. (2014). *Interactive and creative learning of the adults.*
44      *New World Encyclopedia. Creativity.*
45      *Creative Education Fundation. What is CPS?.* https://www.creativeeducationfoundation.org/what-is-cps/ ; Baumgartner, J. *The Basics of Creative Problem Solving – CPS.* https://innovationmanagement.se/2010/06/02/the-basics-of-creative-problem-solving-cps/

skills, lack of perseverance in learning, no access to quality learning opportunities etc.

Another observation we all had was that creativity is not represented enough in adult education. This motivated members of Društvo DISORA to start exploring the topic and inviting the partners that had interest, enough know-how to tackle the topic and the ability to use the project results. Soon it became evident that creativity can be a very useful addition to education, especially when dealing with learning topics that, for various reasons, seem hard and abstract to adult learners.

Creativity is universal. It can be used to better define, understand and solve almost any problem. It is a trait that thrives in group situations while at the same time allowing individuals to express their individual potential. It also does not strictly require a person to be a great writer, extremely eloquent speaker or a very extroverted person to be able to express their own creativity, giving learners of all types an opportunity to benefit from learning that fosters creativity. Creative learning is often closely connected to concepts like »natural learning« and »transformational learning«, it is said that it gives learning meaning and purpose.

This led us to connect ICT and creativity. We often saw that adults were »stuck« with some ICT problem that was maybe quite small but for them it represented a challenge they were not able to overcome on their own. It seemed like they are lacking some essential piece of information or context to understand the problem.

As (adult) educators we knew that traditional ICT learning often makes learners passive observers, learning is too fast and often abstract which produces poor educational results. This kind of learning cannot adequately address the challenges adults face in ICT education. On the other hand, many of these inadequacies and challenges can be addressed if we foster creativity in adult learners. If we present the lack of ICT skills into a series of problems or – even better – challenges that need to be understood and solved, ICT becomes an excellent topic to approach from the perspective of creativity. It becomes a way to help adults learn an essential skill and develop their creativity at the same time.

## 3.2 Creativity in the framework of creICTivity

As mentioned at the beginning, creativity is a vast concept. For the purposes of the project, we needed to give it some context and direction.

To give it direction, we needed to define the main characteristics of the learning that we wish to promote with the project. That is the learning that takes the natural creativity of learners and uses it to help them understand and use ICT.

The building blocks of this kind of learning are:

- Interactivity
- Playful attitude
- Discussion
- Providing context
- (Critical) reflection
- Spirit of experimentation

This kind of learning promotes personal growth and unlocks the potential of the learners, resulting in their ability to **creatively interpret the knowledge gained**. In the case of ICT to be able to contextualise their knowledge on the basis of the ICT challenges presented to them and apply it in different situations and even see the common thread between them.

Regarding context, the type of creativity fostered with creICTivity can best be described as **practical creativity**. Practical creativity manifests as the ability to solve problems.

## 3.3 Adults, ICT and »habits of mind«

Because of different factors that form their life experiences, adults develop certain ideas and attitudes about many things. These ideas are often hard to change and are sometimes called »**habits of mind**«. ICT is a topic that forms especially strong »habits of mind« because many adults did not grow up with ICT and often see it as an inconvenience rather than something useful, they lack training in ICT, don't have time to learn it or are unsuccessful when they try.[46]

»Habits of mind« are ideas that are »unexamined«. They form »boxes« that »trap« our ideas, prevent them to develop further and our knowledge to grow. Learning that fosters creativity is a good way to change our »habits of mind« as creativity brings flexibility and an element of (self) examination to our thinking. Creative thinking is not called »thinking outside the box« by accident.[47]

ICT as a topic is also very suitable for fostering creativity. It allows interaction, participation and active demonstration of knowledge or creations. This gives learners an opportunity to present their accomplishments and originality and gives them a sense of accomplishment. ICT also allows learners to experiment with ideas in a safe environment and to repeat the process many times without negative consequences in they make a mistake. ICT can be used at various times and places also outside the classroom, for example mobile phone. If used correctly ICT is one of the most important tools to develop cognitive, social and technological skills. Use of ICT as a learning tool produces quick results, allows making changes and trying out alternatives. Interactive nature of ICT engages learners. Ability to store, transform and change information and results allows learners to analyse, interpret and synthetize. Knowledge can be more easily and quickly shared among teachers and learners. All this fosters creativity.[48]

## 4. Methodology of creICTivity

## 4.1 Design thinking

The goal of the CreICTivity project is to achieve effective learning outcomes for adult learners. For this, the needs of the target audience must be understood. To explore the needs of adults with low ICT skills we used the **Design thinking method**. It is a method well suited for adult education. It allows the target audience to explore and define their own needs and the educators to **empathise** with them. As such the methods allowed the target group to actively participate in the creation of the project results.

Design thinking challenges assumptions and redefines problems and is most useful for making sense of ill-defined or unknown problems. In our case the problems were:

1. perception and attitudes on creativity by ICT adult educators – how they understand it, are they willing and able to use it etc.

2. needs and obstacles of low-ICT adults regarding ICT learning

More about the design thinking method and how to conduct design thinking workshops can be found in the **Design thinking workshop guidebook** that we created in the framework of the project and is freely available as a separate project result in all partner languages and English.

## 4.2 Challenge-based learning

The second method is challenge-based learning focused on ICT.

The main goal of this approach is to engage the learners to look at their lack of ICT skills as a series of problems or challenges that can be analysed, understood and solved. The challenge is solved when a learner knows how to perform something they did not know how to do before and is perhaps even able to apply this new skill in a different (but similar) situation.

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46          Tsai, K. C. (2013). Two channels of learning.
47          Ibidem
48          Nikolopoulou, K. (2018). Creativity and ICT.

To give the approach some structure and form, we created **6 ICT learning modules.** Each module is centred around **a challenge** or in some cases two. Each challenge describes a real-life ICT-related situation that everybody can encounter (for example adding an attachment to an email to send a family photo to a relative) and that demands a relatively basic level of ICT skills and understanding to solve.

The challenges are important for two reasons.

First, **they help us »organize«** different aspects of ICT skills into logical units and then describe them in the form of easily relatable everyday situations that include ICT skills, like the one mentioned above.

And second, **challenges help foster creativity in learners.** There is a school of academic thought that believes that creative learning takes place (only) if learners are faced with a series of engaging challenges.[49]

Because the challenges we created are intended for adults with low or no ICT skills, they can be described as simple for a skilled or maybe even average ICT user. **High difficulty is not the goal.**

The challenge must be demanding enough to pose a challenge while at the same time simple enough to keep the learners motivated and engaged. Solving a reasonably demanding challenge will give the learners sense of accomplishment and validation, failing because it was too hard will frustrate them.

Challenging-enough level of difficulty is especially important. Adults like to build their own knowledge through a pleasurable learning process. To foster creativity, their learning process must be **simulative and involving**. This allows them to enjoy new (learning) experiences through exploration, deduction, analysis, synthesis, generalisation, abstraction and concretization. They are able to build and redefine concepts and meanings based on their experiences which leads to creative learning and thinking processes. Learning is most effective if learners are involved in the process. To achieve their involvement, we must understand their motives, attitudes and goals.[50]

This is why when creating the modules, we focused on creating versatile challenges that contain enough basic and universal knowledge that adult learners can »discover« through learning that promotes creativity, supported by dedicated ICT teachers.

Examples of the challenges created in the framework of the creICTivity and some additional exercises for fostering creativity are collected in a separate document entitled **creICTivity learning modules and creativity enhancing games** that is freely available as a separate project result in all partner languages and English.

## 5. Steps of the creICTivity learning process

CreICTivity learning process follows the key steps of the **Creative Problem Solving (CPS) model**.

The process is founded on two ideas

- Everyone has potential to be creative
- Creativity is a skill that can be developed

Some of the steps of the model have been adapted to better fit the informal nature of adult education and learning needs of adults with low ICT skills. Steps 1 to 3 are exploratory and preparatory while steps 4 to 7 demand active participation from the learners and interaction between the learners and the teacher to solve the ICT challenges.

Here we describe each step, adding to them some additional comments on the role of teachers and learners as well as the thinking processes and changes in attitudes that are the goal of the process.

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49      Tsai, K. C. (2013). Two channels of learning.
50      Oprea, C. L. (2014). Interactive and creative learning of the adults.

**Step 1: Identify the problem**

The problem to identify is: »Which ICT skills are our learners lacking?« This can be initially done by talking to the learners about the ICT skills they wish to learn or improve in. This can be one specific skill like how to add attachments to emails and other types of messages or it can be more than one skill. By talking to learners we make sure that they will be interested in learning. Methods like surveys with open-ended and closed-ended questions about subjective perception of the level of ICT skills can also be used.

The teacher can also identify the most relevant skills from their previous experience with a specific group of learners if the experience has provided enough information about the lack of certain ICT skills. Usually the combination of direct communication with the learners and adding elements from previous experience with them will lead to the most accurate identification of the problem or problems.

Objectives of step 1:

- Getting to know the topics the learners lack

- Selecting the most important ones (if the number of topics is very high)


## Step 2: Research and clarify

Once the teacher has identified the problem or problems, it is time for a deeper research that will clarify them better. This can be effectively done using the **Design thinking method**.

Design thinking is used to find out more about problems and situations that are unknown or not sufficiently known. It is often used to bring clarification about the needs and attitudes of certain groups of people toward a certain problem. It uses **empathy** to help members of the group immerse themselves in the topic from different perspectives and in the process formulate answers to questions they didn't even consider before. The method fosters creative thinking by introducing methods like brainstorming and ideation[51] to the thinking process.

As such it is very useful for help adults with low ICT skills to examine and better define the skills they are lacking and the obstacles they face to improve them. This activity can help the teachers and the learner identify new and different lack of skills as in step 1.

Objectives of step 2:

- Empathise with the members of the target group and see ICT from their perspective

- Get a clear picture of the reasons for the lack of their ICT skills and of the obstacles to obtaining them

- More precisely define the ICT skills to address with the learners


## Step 3: Formulate creative challenges

After the information obtained during the Design thinking activity is known it is used to create corresponding ICT challenges. Formulating a challenge as a starting point of creative learning is extremely important.

The challenge »organises« several ICT skills into a relatable and understandable situation. The challenge is also what engages the learners and fosters creativity, because it motivates the learners to (critically) reflect, imagine, propose and test solutions to the challenge. All these are important steps leading to creative or »out of the box thinking«.

For the challenge to have this effect on the learners, it must have **the right level of difficulty**. What that level is depends on the group in question.

In general, **the challenge must be difficult enough to present the learners with engaging challenges at the edge of their abilities** but not so hard that they are not able to relate to it and solve it with some direction from the teacher.

The challenge must also present some sort of **relatable situation** that the learners encounter often enough.

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51      *A process of developing new ideas related to a certain topic or problem. It includes techniques like brainstorming, idea mapping and SCAMPER. It is closely connected to creativity. Also a part of Design thinking method.*

For example, one of the challenges we prepared is:

»A relative sent you an e-mail with some photos of their new born baby. You wish to have some of the photos developed and framed. You have to select the best photos and somehow transfer them to the photo studio«.

This challenge speaks to seniors as well as adults of different ages. It involves a number of basic but important ICT skills like using email, downloading attachments and finding them on a computer, attaching selected files and sending them via email.

Because they are presented in the form of a relatable challenge they become much more »concrete« in the minds of the learners. The challenge also demands that the steps needed to complete it are understood separately as well as a whole that needs to be completed in a specific order. This gives the ICT skill **purpose and context** that makes them more connected to real life.

To make the challenge a little more complex, we added an extra twist to the situation:

»Internet connection is not working. How do you transfer the photos to the photo studio without using the internet? «

With this addition we invite the learners to think even more »outside the box« and understand that photos (and other) types of information can be transferred using simple USB devices which is a very useful skill in many situations.

Objectives of step 3:

- Turn lacking ICT skills identified before into engaging challenges for adult learners

- Finding appropriate level of difficulty to at once motivate and challenge the learners

- Constructing the challenges in a way that shows a clear objective but does not directly point out the necessary steps to reach it


## Step 4: Reflect on the challenge

With this step we want to stress the importance of reflection for the creICTivity learning approach. Reflection allows the learners to »spend some time« with the challenge before engaging with it practically. By reflection we mean discussing and analysing the challenge in a group setting with support of the ICT teacher.

This process includes two main components – **experience sharing** and **critical reflection**. Sharing experience is a very important step in understanding the challenge.

The process starts with the introduction of the challenge. The teacher presents it and invites the learners to share their experiences: *Were you ever in the same or a similar situation? How did you handle it? What was the biggest problem for you? etc.*

**For adults learning is in essence making sense of their life experiences which makes experience the basis for their learning**. Experience puts the learners **outside their comfort zone** and motivates them to examine their assumptions about their ICT (in)abilities. By sharing they create a shared experience and create an atmosphere of empathy that contributes to a safe learning environment.[52]

**To make the learning meaningful**, experience sharing must be accompanied by critical reflection: in this case a guided and honest examination of obstacles that stand between the learners and the ICT knowledge needed to complete the challenge in question. These can be anything from not understanding the context to not knowing how to execute a specific ICT command (for example add an attachment) or even a psychological fear of using ICT.[53]

Critical reflection impacts how the learners understand the challenge and see themselves as ICT users. By putting their obstacles, fears and lack of knowledge into words and sharing them with others they are in essence **re-stating the challenge and better defining the shortcomings they need to overcome to solve it.**

In this way they are examining their »habits of mind«, allowing themselves to see new connections and meanings, the signs of creative thinking. At the same time, they are providing the teacher with valuable information about their ICT abilities and attitudes.

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52      Tsai, K. C. (2013). Two channels of learning.
53      Ibidem

Critical examination helps the learners to »separate the wheat from the chaff« by eliminating some of their unfounded fears and poor ICT reasoning. This leaves them with (better) understanding of the ICT challenge in front of them and of the main obstacles they face on the way to solving it.

This process can be summed up well with the quote by George Keller[54] who said »*Creativity, it has been said, consists largely of rearranging what we know in order to find out what we do not know.*«

Objectives of step 4:

- Allow the learners to think about the challenge

- Using combined group experience to understand the difficulty

- Reflect on personal obstacles to understand and solve the challenge

- Challenge »habits of mind« the learners have

- Improve motivation and confidence of learners to tackle the challenge

## Step 5: Generate ideas

While step 4 focuses on improving the learners' understanding of the obstacles that a proposed ICT challenge presents to them in terms of skills and attitudes, step 5 focuses on understanding the nature and the context of the challenge.

We believe ICT knowledge is only really useful if it can be used in a proper context. This is why we designed our ICT learning modules around a challenge. A challenge demands that the learners understand not only individual ICT commands but how they work in a sequence, what results can be expected when we execute them etc.

First the learners look at the challenge and try to find a solution or solutions to it. This can also mean they need to »define« them.

If they look at the challenge »A relative sent you an e-mail with some photos of their new born baby. You wish to have some of the photos developed and framed. You have to select the best photos and somehow transfer them to the photo studio«.

they can, for example, come up with three viable solutions:

1. We send the selected photos to the photo studio via e-mail and ask them to develop and frame them for us.

2. We transfer the selected photos on a USB stick and take them to the studio ourselves.

3. We us a printer to print the selected photos and frame them ourselves.

The number of solutions depends on the challenge presented. The teacher should motivate and guide the learners to generate multiple possible solutions. For this the learners must use divergent thinking. If the learners are able to find more than one viable solution, this is a sign of a creative thinking process.

To separate viable solutions from non-viable ones, the teacher must help the learners with his knowledge. The learners must also stop thinking divergently and switch to **convergent thinking**[55].

If many solutions are found, it is ultimately up to the learners and the teacher to decide which ones they wish to try out in practice.

Next the learners and the teacher try to define the actions they need to execute to implement the selected solution. The steps can be described in a broad but clear enough way.

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54          *An American scholar of higher education (1928-2007)*
55          *Style of thinking that tries to narrow down the possible solutions to a problem to find the most suitable one or ones on the basis of previous knowledge and new facts presented.*

For solution number one (We send the selected photos to the photo studio via e-mail and ask them to develop and frame them for us.) they can say:

Action 1: We open the e-mail message containing the photos

Action 2: we download the attachments to our computer

Action 3: We find the downloaded attachments and select the photos we want to develop

Action 4: We create a new e-mail message to the photo studio describing what we want

Action 5: We attach the previously selected photos and send the message

The actions must be described accurately enough and clearly enough to make sense to the learners. The teachers should allow the learners to formulate the steps in terms of content and order of execution but should provide guidance if they get stuck. The same can be done for all proposed solutions.

Objectives of step 5:

- Find as many viable solutions to the challenge as possible

- Describe the actions needed to complete the found solutions

- Put the actions in the right order

- Discuss the actions to check the learners' understanding

## Step 6: Implement solutions

Now it's the time to complete the solutions and steps formulated in step 4 and 5 in practice.

The teacher first recaps the challenge, the solution and the steps that will be taken to complete it.

Then he or she demonstrates the steps for the learners using a projection screen for all to see. The learners try to replicate the ICT commands.

The teacher should comment and describe the process so that **the line of thinking** about the challenge started in step 4 (reflect on the challenge) and continued with 5 (generate ideas/plan of action) **is maintained**. They should explain how each action is performed from the technical standpoint (how to download the attachments, how to locate them on the computer, how to select the ones we need etc.) but also what is the result of each command or action executed and how it moves the learners closer to completing the challenge.

Demonstration should be accompanied by a real-time dialogue between the teacher and the learners, describing the process, resolving problems if they occur and using mistakes as learning opportunities. The teacher should give the learners **the feeling of autonomy** in their actions and only intervene (or the assistant) when they get stuck and can't correct their mistake on their own.

Main objectives of step 6:

- Demonstrate all the needed actions to implement the solution

- Support the demonstration with vivid explanation of each action taken

- Support the learners so they can complete one or more solutions

- Increase the learners' feeling of autonomy as ICT users

**Step 7: Reflect and generalise**

In practice it is often the case that the learners are able to complete some ICT task in the classroom but are unable to do so later at home or in a situation that is similar but not the same as the one they tackled in the classroom.

It seems that the knowledge they gain is not understood on a deeper level, they have trouble generalising it, finding similarities in different but analogous situations and using it in confidently in various contexts.

For this reason, **reflection with an attempt at generalisation of gained knowledge is needed** in the last step of the process.

The teacher guides the learners through the process once again, asking about the experience. *How did you experience each step of the process? Which new ICT skills did you learn? How useful was your previous knowledge? What was the biggest realisation for them? How did their view of ICT usage change?*

The learners should comment on new skills they learned as well as on any new insights and connections between ICT operations they established.

This step is also an opportunity to clarify any remaining questions that still remain regarding the ICT challenge.

In order to be more confident and independent ICT users, **the learner should ideally be able to generalise their ICT knowledge and apply it in similar situations**. At the end of this step the teacher asks them to come up with some real-life scenarios similar to the challenge in question where the same ICT skills could be used to solve them.

Objectives of step 7:

- Reflect on new knowledge and new insight into ICT

- Reflect on the learning experience

- Leading learners to find different real-life situations where new gained knowledge can be applied

## 6. Basic principles of the creICTivity learning process

CreICTivity is based on **3 principles** that each contribute to fostering of creativity in learners.

### 6.1 Interactive learning

Interactive learning depends on the relationship between:

- Teachers and learners

- learners and other learners

- learners and ICT

**Interactivity comes from active participation of both teachers and learners, as generators of knowledge**. The learners are »subjects« of learning with a lot of agency over the learning process and the teacher is their »guide«. ICT is the subject that needs to be explored and understood.[56]

Interactivity offers the learners a pleasurable learning experience by allowing them to be **active builders of their knowledge**. This is achieved through exploration, analysis, synthesis, generalisation and practical application. The results are new practical ICT skills but also deeper and better structured knowledge of ICT.

**Interaction between the teacher and the learners leads to creativity if the right conditions are met.**

56        Oprea, C. L. (2014). Interactive and creative learning of the adults.

The teacher must organise the information and conduct the learning activity in a way that:

- Animates and incites the learners
- Allows contributions from all learners
- Keeps learners motivated and invested in the learning process
- Promotes divergent thinking
- Establishes connection between theoretical knowledge and practical use

For this to manifest, the teacher and the learning environment must:

- Encourage the learners to ask many questions
- Not provide direct answers but guiding learners to find solutions themselves
- Be flexible and adapt methodologies when needed
- Use mistakes as learning opportunities
- Use methods like brainstorming and open questions that generate ideas
- Focus on the process not the solution
- Focus on solutions to everyday problems
- Encourage communication and discussion between learners and between teachers and learners
- Stimulate the learners to consider new concepts and ideas
- Support independent and autonomous thinking among learners
- Support critical thinking and searching for alternatives
- Support reflective self-learning, finding knowledge on one own initiative
- Minimize the factors that hinder the learning process and cause frustration[57]

The learners will respond to these conditions positively. They will engage and contribute to the interactive nature of the learning process by following the teacher's lead while using their own creativity to find solutions to ICT challenges. In this way the teacher and the learners create an **authentic learning experience[58]** with meaningful results for both learners and teachers.

Interactivity also includes interactions between the learners. Peer-to-peer learning and exchange of ideas is highly welcomed as by »collaborative and peer-group endeavours, creativity is generated in a most effective manner«.[59]

## 6.2 Co-creation of the learning process
Co-creation occurs when the learners not only actively participate but actually contribute content and to a degree direct the learning process. CreICTivity allows that at several stages of the process.

1. Step 2 (Research and clarify): the learners actively participate in the empathy map activity. The activity demands that they reflect on the obstacles preventing them to be independent ICT users, they also need to put themselves in a position of other low ICT-skilled adults. In this way they are the main creators of valuable information that the teachers will use to prepare the ICT challenges.

2. Step 5 (Generate ideas): Learners are encouraged to find multiple viable solutions to ICT challenges. They are in real-time co-creating the learning content to be tried out in the next step.

57       Ibidem ; Nikolopoulou, K. (2018). Creativity and ICT.
58       By authentic we mean an experience that privides lerners with an immersive learning experience that imprints on them more than just superficial knowledge.
59       Galbraith, M. W., & Jones, M. S. (2012). Creativity: Essential for the Adult Education Instructor and Learner. PAACE Journal of Lifelong Learning, 21, 51-59.

3. Step 7 (Reflect and generalise) By finding examples that are similar to the ICT challenge they solved, the learners again co-create the results of the learning process.

This deep level of involvement has other positive effects. To the learners it gives:

- Felling of personal investment and immersion in the learning process
- Sense of achievement when they have a creative idea or compete a task
- Sense of empowerment because they generate solutions to the problems

Co-creation also demands that the learners restructure their knowledge by finding new correlations between bits of ICT knowledge and to think about it contextually. All of these cognitive processes strengthen creativity.

## 6.3 Understanding the challenge
Practical creativity leads us to solutions of various problems but understanding the problem (or an ICT challenge) we are trying to solve is equally if not an even more important part of the creative process.

In the case of the creICTivity ICT challenges understanding them means the following:

- Ability to better understand the situation that introduces a challenge (context)
- Ability to better identify obstacles to solving the challenge at hand (critical reflection)
- Ability to better understand how to solve the challenge (practical use of ICT skills)

The following 3 steps of the creICTivity process help learners gain better understanding of the challenge the most:

1. Step 2 (Research and clarify): The learners are put in a position to re-think their own thinking and actions related to ICT. This reveals to them new information about ICT as a skill and themselves as ICT users.

2. Step 4 (Reflect on the challenge): Reflecting on the situation introducing a given challenge contributes to the sense of »realness« of the challenge. It provides more context by connecting ICT actions (like saving and transferring files, adding attachments, using USB devices) to experienced real-life situations.

3. Step 6 (Implement solutions): Trying out various solutions to a given challenge adds even more real-life relevance to individual ICT skills and actions. It directly shows the results of each ICT action performed. This step connects ICT theory and practice, showing learners that a real life challenge can indeed be solved using ICT.

This process can be compared to uncovering previously unknown pieces of a puzzle or decoding a coded message. It provides the learners with very important information that help them better organize their thinking, identify holes in their knowledge that need to be filled and start mapping a plan of action.

Understanding of a challenge makes the solution of a challenge more meaningful and leads to a deeper **insight** which is the most important goal of creICTivity.

# 7. Learning approach and roles

## 7.1 Role of the teacher

The teacher is the most important link in the process of fostering creativity because **»the students need the permission to be creative and, in some cases, direction as well«**.[60] They also have the best knowledge of the topic of learning and an understanding of why and how to foster creativity.

The teacher must not only convey knowledge but also show the learners that creativity in their thinking and actions is desired. To achieve this, the teacher must adopt the right approach and role. He must strive to:

- **Create an authentic learning experience**

The teacher must **approach learning with enthusiasm**, showing the learners that he is passionate about ICT and project this attitude onto them. He must show that he **genuinely understands** their learning needs and obstacles and wants to be their teacher.

Authenticity is further strengthened through presentation of real-life situations related to the use of ICT in the form of well-crafted ICT challenges. The learners will respond with genuine interest and attentiveness.

- **Facilitate creative thinking**

To stimulate creative thinking in learners, the teacher must also have a creative mind-set. He must understand the basics of creativity and how it can be applied in the context of ICT learning. He must also show some creativity when preparing ICT challenges and conducting the learning process in order to stimulate creativity in learners.

He must allow the learners to be creative by supporting **divergent thinking**. This can be best achieved by engaging the learners in dialogue and discussion about ICT challenges, asking **open ended questions** that put learners **just enough outside their comfort zone** regarding their knowledge. This will challenge their »habits of mind« and put them in a situation to think »outside the box«. They can use **brainstorming** to generate multiple ideas. Here the quantity over quality of ideas is allowed as a high number of ideas is one of the signs of creative thinking. The ideas must of course be examined and only the best ones should be used in practice.

The teacher must provide the learners with enough guidance and support to keep them interested and engaged while **not showing them the solution directly**. He should pose questions and describe scenarios that provide enough clues to stimulate higher cognitive level processes and allow learners to connect the dots that lead to the solution of the ICT challenge at hand.

This process of interaction can look something like this example from Slovenian group:

Teacher: »The internet is out. What can we do to transfer some photos to another computer?«

Learners: »We wait for the internet to come back. « (An unexamined thought, a »habit of mind«.)

Teacher: »Do you know any method of transfer that does not require the internet? « (Challenges the »habit of mind«)

Learners: »We copy them on a cd?«

Teacher: »A possible solution but not the simplest and the most practical one. Are there any devices that can help us with that?«

Learners: »These sticks or keys…« (A new connection is created, a new context and meaning.)

Teacher: »Yes. You are thinking correctly but probably have not used them before.«

Learners: »Yes.«

Teacher: Shows a USB stick and describes what it does and why it is a better option than copying files on a cd.

Another good way to facilitate creativity is **using mistakes as learning opportunities**. Mistakes in thinking

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60      *Tsai, K. C. (2013). Two channels of learning.*

or acting are in essence small **problems that can be analysed and examined**. This can be especially well done in a group setting where learners can help one another find flaws in their ICT reasoning and actions. Learning from mistakes will also change the mind-set of learners who often can't confidently use ICT because of fear of making a »mistake«. Analysing their mistakes will empower them and make them more open to new learning experiences.

**Games and roleplaying** can also be used to foster creativity. Putting the learners in a scenario where they need to think about ICT in a completely unorthodox way demands that they reimagine what ICT is and how it can be used. **For this purpose, we prepared a number of creativity-boosting games and scenarios centred around ICT.** They can be found in a separate document entitled **creICTivity learning modules and creativity enhancing games** that is freely available as a separate project result in all partner languages and English.

- **Provide guidance and support**

Allowing the learners to think creatively about ICT is important but it can lead them away from practical solutions if they don't have sufficient guidance. The teacher must bring his educational experience and ICT knowledge and intervene when learners get stuck in their thinking or actions. As said before, the teacher must put learners **just enough outside their comfort zone** regarding their knowledge **but he must also provide them enough support** to find a solution.[61] Finding the right balance between the two is a skill that the teacher must develop. If the balance is not maintained, the interactive nature of learning is also lost.

The teacher should also **interpret ICT as a subject of learning**. Adults often can't follow or comprehend how ICT works because they need to know **what happens** when they click on something and **how it happens**. But with ICT they can only see instant results. In the mind of many adults this makes ICT incomprehensible and inaccessible.

The teacher can help them fill this missing part of the puzzle by acting like **an intermediary between the learners and the technology.** He can tell and explain to them what ICT can do and can't do. This is especially important for seniors and others who have trouble adapting to changes in technology.

Another form of support is provided by **using appropriate language**. The teacher should be aware to use simple and very descriptive language. Technological and English terminology should be avoided. The language should be adapted to the understanding of the learners. Terminology that needs to be used should be additionally explained in simple terms. Vivid analogies can be used to describe ICT concepts and processes.

To provide sufficient guidance and support the teacher should develop **empathy for the learners.** He must be able to **»put himself in their shoes«** by getting to know and understand their learning characteristics, motivations, obstacles and talents.

- **Monitor the learning process and be aware of the role of creativity in it**

To foster creativity in learners, the teacher must understand basic characteristics of creativity and its role in education. On the other hand, **the learners don't need to be given this information** as thinking about it can be a distraction. More creativity should be a direct result of the learning process.

They must also be aware of how the process is progressing and how the learners are participating. This allows him to adapt to their level of knowledge and ability. He can for example offer more information to them if they can't find a solution to the challenge or push them divergently by asking them to find more viable solutions if they exist and were not yet identified.

The teacher can also get a sense of how creative the learners are by paying attention to some observable signs of creativity:

- Fluency: Are the learners able to propose a number of possible solutions to the ICT challenge at hand.

- Flexibility: Are the ideas proposed all the same or was there variation in thinking.

- Originality: How original, different or unusual the ideas are.

- Detailedness: How much detail are the learners including in their ideas, are the steps defined and make sense in the context of the challenge.

61       *Tsai, K. C. (2013). Two channels of learning.*

- Transferability: Are the ideas presented in a way that allows them to be used in similar or analogous situations.

It is important to know that **even simple ideas can demand a lot of creativity from adult learners because their knowledge is low**. Especially **detailedness and transferability** are good indicators of higher cognitive functions and creativity because they point to a deeper understanding and generalization of knowledge.

## 7.2 Role of the learners

The learners are the recipients of knowledge but also the co-creators of the learning process. They must accept the teacher's »**permission**« to be creative.[62]  They bring their experience (good or bad) with the learning topic, their intrinsic motivation, curiosity and potential for creative thinking that the teacher can strengthen. Only with their active participation can the learning process be interactive. By interacting and communicating among themselves they teach also one-another and by doing so develop their own creativity

## 7.3 Role of the environment

There is no definitive rule on how to set up a creative classroom. It can be said that it must be flexible, allowing different types of learning styles from group learning to individual learning. Various types of furniture from chairs to sofas can be used. The rooms should be bright enough and free of distractions to allow effective communication and flow of ideas.

**More important is the environment all the participants create.** The environment that supports creativity combines **freedom of expression** and security, there must be a **high degree of tolerance** and openness for divergent problem solving. The environment **must not be highly hierarchical**, it must allow independent and self-initiated thinking about the subject matter. The environment must also encourage self-reflection.

## 8. Learning techniques

When preparing and planning the learning activities, educators should keep in mind that the activities must be as simple as possible to implement while focused on the learners. Here we present some techniques that can be used. They are not only simple to implement but they also help the learners improve their creative thinking.

- **Discussion**

Although obvious, the importance of discussion must be pointed out. Discussion supports interactivity by engaging the learners. It allows participation, sharing of ideas and challenging habits of mind«. **Storytelling** is also a useful method for sharing experiences. Learners can tell personal stories about ICT use, teachers can tell "origin stories" of the ICT challenges etc.

- **Brainstorming**

Brainstorming allows learners to think more »freely« about ICT. They can focus on the big-picture without worrying about specifics they maybe don't know. Brainstorming involves the whole group, taking advantage of collective knowledge and experiences. Brainstorming fosters higher-order thinking processes and creativity. The method is well known among educators. There are a number variations of the brainstorming method and many easily available resources to learn more about them and choose the most appropriate one.

- **Restating the challenge**

By restating the challenge, the learners describe it in a way that they better understand and are then maybe able to think about it easier. Restating demands a certain level of knowledge and imaginative thinking. It builds new meaning and insight. It allows learners to co-create the learning process.

- **Dividing or reducing the problem**

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62        *Tsai, K. C. (2013). Two channels of learning.*

Sometimes an instruction like »send a picture to a friend via email« is to general for adults and they don't know where to start. Dividing the instruction in smaller steps like »first, take a photo with your phone«, »find the picture gallery on your phone or on your computer«, »log in into your email account«, »start a new email message«, »look for the attachment icon« etc. presents a more detailed picture that gives more information and fills in the gaps in the learners' understanding of ICT.

- **Building on existing knowledge**

Sometimes adult learners already have some relevant knowledge but they don't know how it fits into a bigger picture of ICT use. If they demonstrate such knowledge, the teacher should explain how it can be used to complete the challenge and encourage them to develop it further. To promote active participation, the teacher can ask the learner with the knowledge to explain and demonstrate it to the rest of the group.

- **Using mistakes as learning opportunities**

Mistakes in thinking about and in using ICT are very common and adults are afraid to make them. A mistake can be used as a learning opportunity. By examining a mistake in real-time the learners can learn what not to do and also that making mistakes is a normal part of ICT use that cannot be avoided and should not be feared.

## 9. How creICTivity fosters creativity

Depending on the main goal, education with elements of creativity can be described as »creative education« or as »education for creativity«.[63]  **creICTivity is »education for creativity«** because the learners must learn to think about ICT creatively to use it properly.

We believe that the methodology and the basic principles of creICTivity are well suited to achieve this goal **because they lead to 4 changes in cognition and attitude essential for development and strengthening of creativity.**

The processes described below are more prominently present in some of the steps of the creICTivity learning process but usually go on throughout the entire process. Like creativity, they are not easily quantifiable and do not necessarily occur linearly.  They are:

- **Making sense of experience**

Experience is the starting point of learning for adults. It provides context and strongly influences »habits of mind«. If experience is bad and not examined, »habits of mind« stay unchanged which hinders educational and personal development.[64]

Learners make sense of their ICT-related experience most directly in steps 2 and 4 of the creICTivity learning process by trying to empathise with adults in similar situations as their own using the Design thinking method and by sharing and comparing their own stories of ICT failures or successes with other members of the group.

- **Creating new meaning through critical reflection**

Interactive learning with critical reflection of actions, attitudes and procedures can lead to **creation of new meaning** for the learners**.** This leads to better understanding of ICT as a skill and also to a more meaningful interpretation of past ICT experiences. »Habits of mind« are being examined.[65] This process goes on mostly in steps 2, 4, 5 and 6.

Through discussion, reflection, re-statement of the challenges the learners go through a process of **mental simulation**. Mental simulation actually engages some of the same cognitive processes that are active during practical work. Bits of knowledge are rearranged and connected in new ways and clearer **mental images** regarding ICT are created.[66]

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63      Tsai, K. C. (2013). Two channels of learning.
64      Ibidem.
65      Ibidem. ; Oprea, C. L. (2014). Interactive and creative learning of the adults.
66      Agnati, L. F., Guidolin, D., Battistin, L., Pagnoni, G., & Fuxe, K. (2013). The neurobiology of imagination: possible role of interaction-dominant dynamics and default mode network. Frontiers in psychology, 4, 296.

- **Developing insight (the Aha! moment)**

The process of making sense and reflecting on one's experience and searching for solutions before trying them out transforms the way learners think about CTI. Through a process of incremental knowledge gains associations between experiences, new information, actions and their results are generated. Bits of loosely connected knowledge and ideas are being rearranged and assembled into a more coherent »picture« of ICT.

This leads to an often sudden realisation or the Aha! moment as in »Aha! This is how this is done!«. The Aha! moment is also known as insight and is closely connected to creativity and the process of problem solving[67].

This process occurs most prominently somewhere between step 4 and step 7 of the process.

- **Generalization and concretization of knowledge**

If the learners are able to create new meaning and insight, they already reached a higher level of ICT knowledge and skill and creative thinking ability. However, there is one more **qualitative leap** in their thinking they can achieve.

Generalization and concretization of knowledge means to be able to effectively combine bits of knowledge and ideas in response to different situations. The knowledge becomes stable and can adapt to challenges, even if they are new to the learner. It can also be upgraded with new information and insights. This is the definition of practical creativity.

This process occurs most directly in step 7.

The nature of this processes is such that they encourage the learners to analyse, interpret and synthesise the information which engages **higher level cognitive processes** that reach their peak in generalization and concretization of knowledge. Knowledge gained in this way has higher applicative value and supports curiosity and the spirit of invention. This also results in higher retention of the learning results.[68]

Another positive aspect of this is that it allows al learners to develop their creative potentials, regardless of their precious knowledge, experience or cognitive ability.

It is important to understand that the knowledge gained during the learning process will further improve and become concrete only with regular practice and usage of ICT.


# 10. Comments about target groups

In this section we are presenting our observations and information gathered about our target groups. The information presented was gathered during the workshops using the Design thinking method, during the pilot trainings where we tested the ICT learning modules and during various interactions we had with members of the target groups. Each country worked with a different group of adults. The common point was the low level of ICT knowledge. The observations are not limited only to the adults who participated in the project but are valid for the group as a whole.


**Slovenia**


- **Group characteristics**

Seniors are members of a generation that did not grow up with ICT. They are not »digital natives« and they face a technology-gap that is hard for them to overcome. They have trouble learning about it because they don't understand how the technology works, they often don't understand the terminology used or sometimes even the purpose of some programme or application. This makes it harder for them to receive and process ICT-related information and makes them much slower and reluctant learners. Although there are limitations to how much they can learn, they can competently learn the things they are interested in, if they are allowed enough time and provided with enough support and understanding.

They have mixed emotions about ICT. Very often they are afraid of using ICT because they will »break so-

67      The connection is still not researched enough but there are many factors that point to close connection or simillarity between insight, creativity, the creative process and problem solving.
68      Oprea, C. L. (2014). Interactive and creative learning of the adults.

mething« or »delete some important information by pressing the wrong button«. They also mentioned fear about negative effect on their health from some form of radiation.

The main feeling seems to be fear and frustration because they feel they are not independent ICT users. This makes them even more likely to make mistakes which leads to more fear and frustration. Those who have some ICT skill thus mostly stay in their comfort zone and rarely seek to be more ambitious ICT users. Many of them are too afraid or indecisive to even try to learn the basics of ICT.

They have often been unsuccessful using ICT, because even a small unexpected problem is for them a disaster. We mentioned an example of not finding the @ symbol. This can completely throw them off and they can't continue with their work. Another example would be if an unexpected or not understandable window appears on their screen. They dont know if they should close it or not because they don't know what consequences this will have...again making their work unsuccessful. There are many examples of them being unsuccessful because they dent know how to react to small unexpected situations as they are not independent ICT users.

On the other side there is curiosity and the natural wish to learn. They are quite well aware that ICT is a great learning tool but they poorly understand its possibilities and limitations which leads to confusion and again to fear. Biggest motives for learning are the ability to communicate, to learn about healthy lifestyle and to follow the daily events.

Often making the first step and start learning is the biggest obstacle as they don't know where to start, who to ask etc. They also feel that they will not be understood by the teacher if they join some ICT class.

- **Obstacles and motivations**

A number of obstacles were expressed by seniors or observed by our ICT teachers. We grouped them by main themes.

**Technological gap:** This is a big one. It makes it harder for them to understand ICT. The technology is foreign to them and the feel that is changing rapidly, making it a permanent challenge.

**Expectations:** Their ideas about ICT are often unrealistic, because they do not understand its advantages and limitations. They sometimes expect too much from ICT like it is some kind of magical tool and other times they feel that they are not able to learn. Because of their poor understanding of ICT they are often unable to ask precise questions about it and use terms like »learning the basics« without knowing what these are. This means that they are not aware of all of their needs and obstacles they face.

**Attitude and lifestyle:** It is often said that seniors don't have enough time to do all, they want to do after they retire and this was confirmed also by our group. It seems that they feel that they can spend their time more productively then learning the tricks of ICT use. ICT is not the focus of their lives.

They are set in a strong daily routine and spending a lot of time on ICT is not a part of it. What they see to be more important are personal contacts with friends and family. Taking part in social activities like playing games or exercising. They can spend a lot of time caring for their spouse as they are older and need help and support through the day.

It seems that they are not willing to put as much time into learning ICT as they would need given their obstacles.

**Rigid way of thinking:** Mostly they see ICT as a series of independent functions that have to be learned by heart and repeated in the exact same order and under exact same circumstances…and if something changes this usually means a problem they can't solve. It can be said that they are not very well aware that in order to be more independent ICT users, they need to learn some basic ICT principles instead of following the same steps all the time. It can be said they are not aware that thare are some general principles that make ICT use simpler once you learn them. It also seems that they have trouble understanding what are realistic goals regarding learning and using ICT are when it comes to seniors. They often have high expectations and when they don't meet them they are unsatisfied with their ICT abilities and learning process in general.

It can also be said that they are not aware of the importance of practice and frequent use of ICT in order to internalise the knowledge and skills. Often they attend some ICT class and then expect that this is enough when it clearly is not. At home they use ICT rarely, maybe once every few days or even less when in reality they would need to practice daily for a long period of time

**Finances:** Most of seniors have low incomes so knowing what to buy is important. They are unsure what to buy. They do not know the technical terminology, don't know what type of computer, tablet of phone is the right one for their needs, also what they actually need. They are afraid the sellers will take advantage of

them and then they will overpay the equipment or not buy enough and miss out on something important. We saw a number of cases where seniors needlessly bought printers which they don't need, because they think they will write and print their writings out which they don't do. They are also not aware that printing in small quantities is better done at a print shop. The printers are bought but never used.

Main motivation for using ICT is to be in step with the times: to communicate with peers and family and to find various types of information, cooking recipes, daily news, obituaries etc. They are also aware that more and more services like doctor appointments are done on-line but this is a foreign idea to them and most of seniors are not skilled enough to do it. Learning how to use these services would be hugely beneficial.

- **How to approach and support them**

Addressing each of their needs as a separate problem is not a good strategy. Seniors will benefit the most if they gain a broader and generalised understanding of basic ICT skills. This is not easy but if achieved the benefits to the seniors will be great because their knowledge is the most fragile of all the groups of adults.

For this the teachers must be aware that seniors are not »digital natives«. This means that not only their skills must be improved but also **their frame of mind must be influenced** in a way that will accept ICT as a part of everyday life.

The teachers must work on building the **confidence** and **empowerment** of seniors as ICT users. This is perhaps the most important as it opens the door to more effective learning. This is best done by encouraging seniors to be regular ICT users and not to be afraid if they encounter a situation that is new to them. They must understand that making mistakes is part of the learning.

The teacher must also help seniors to **gain ICT experience** because experience is the foundation of learning. Seniors don't use computers regularly. It should be explained to them that regular daily use is normal and necessary for improving their ICT skills. With more experience, the knowledge they have and the mistakes they make will start making sense.

One way to do this can be through encouraging on-line **learning**. Seniors like to learn but they rarely use learning resources available online. The teachers should show them where to find various learning resources like free language courses to increase their ICT use.

Seniors also need advice and **guidance about which devices to buy**. They often buy things that are not best suited for their needs or even completely unnecessary. This just confuses them about ICT and creates more unnecessary expenses for them.

In terms of approach and methods, the most important is **interactivity** between teachers and learners. The teacher must invite the learners to actively participate in learning and give them the sense of agency. To achieve this **working in small groups** where learners can interact is probably the best way to go.

Using appropriate language is another important thing. The teachers must adapt the explanation so that senior understand it. Technological jargon and English terms should be avoided or explained properly. Simple and relatable analogies should be used to describe how ICT works, how

And most importantly, teachers must be **role models** to seniors. The seniors rely strongly on the teachers and admire their skills. The teachers must show **enthusiasm for ICT** and **empathy and understanding for the learners' needs**. If the learners see these qualities in their teachers, they will feel validated and safe and willing to learn.

## Croatia

- **Group characteristics**

Our groups were made of women with an average age of 40 and mostly completed secondary education. For them, is very important to stay connected and be available to family and friends so they use ICT every day but only for communication. Most of the participants need basic ICT knowledge. With different online platforms they make family/friends arrangements, share photos of loved ones and overall stay informed about what is going on with people in their micro-world. They found a way to learn ICT skills that allowed them to satisfy the need for connection and are self-taught. Many do not have the need or motivation to learn about complex ICT solutions.

They are aware that their life could be improved and simpler if they knew some other ICT skills, but it was not priority for them. So, they greeted us warmly and were open for learning. They know that ICT can be used in various ways but, as they said, it is easier to ask their husbands or children to do for them what they need, for example: making an appointment with a doctor, shopping, bank transfers… A small number of participants shows a desire to learn about mobile applications related to entertainment and leisure, software for monitoring and control of the content that their children are watching.

Generally, older participants have an attitude that using ICT is too complicated, they do not trust themselves that they will do what is needed to reach the outcome they want and need to be reminded that for confidence in ICT skills, practice is necessary.

Fear is the main emotion they are facing so they are scared that by using some of the ICT possibilities they would make a mistake that could not be corrected for example that they will lose money during online shopping or bank transfers. They are also familiar with the feelings of overwhelm and frustration when they have too many options to choose.

They also do not understand how ICT operations work and cannot imagine in their minds what is really happening when they choose some option. That was the big part for them of not being skilful in more ICT options.

But all of them were curious, open to experimenting during modules, trying creative games, and learning new skills. They understood that learning new ICT skills will be beneficial for their everyday life and they were ready to face their unpleasant feelings. Younger participants are more open and curious to learn new ICT skills, with less fear.

- **Obstacles and motivations**

There are several obstacles that were mentioned and observed and will be listed here. Of course, all of them interfere.

Emotional. Fear is basic emotion and women in our pilot training feared how they would be perceived by us and the group, would they understand challenges we offered them, would they do something that will not be fixable, would they be »a good student«.

Mental. Attitude about ICT skills that those are hard to learn and that they do not have the capacity to understand them and/or learn them. Linear thinking is also something that we had to deal with, and creative games really had helped a lot to soften the thinking about the ICT and find space for implementing new strategies.

Technical. Some of the women are overwhelmed how fast the technology progresses and the challenges for them is just growing. Also, some of them inherited mobile phones from their children and the system does not support some of the ICT operations.

Personal interests. The majority of women in our group just simply are not interested in ICT and although they are aware of the benefits and good impact that ICT skills can have in people's life, they use it only for communication with family and friends which is their primary interest.

The motivation for our group to learn more ICT skills is to make their life simpler and to be more independent users so they do not need to ask other people for help. They are aware that if they use more ICT options, they could save time and money. For example, they would not need to go to the shop but order online or they could make an appointment with the doctor just with several clicks.

All of them have things they like to do, or hobbies and they are aware that by using ICT they could search, find, and improve their knowledge of preferred subject. And they feel excited and proud when they learn something new.

Some of them want to learn what they think has a purpose in their lives, what will provide them with a better-paid job, extra income etc.

- **How to approach and support them**

As mentioned above, our group was made of women who have mainly finished going to school around 20 years ago and participating in some education is not something they do regularly. They shared with us about their concerns how this education will look like. So before meeting the group is important for teachers to be

aware that the participants could be cautious towards us and the education in general. Warm and friendly start will melt any first distance.

It is necessary that teachers try to connect to every participant by short eye contact and after introducing themselves to give some time for participants to ask questions about the education. In dialogue we can build trust that is important for cooperating and learning.

Paced humour is always welcomed and we want to teach in a relaxed atmosphere.

Really important is to actively listen to participants, their experiences, wishes and needs and in that way adapt the process. Some parts of the modules can be done quicker than planned, some slower. And it is good to have several ideas for the challenges so those can be adapted too.

It is also important to acknowledge every fear, frustration whatever shows up and make participants stop participating in the process. To give time is always a good idea.

Dynamics in voice and sentences of empowerment or just short physical exercise when energy tends to go down can easily make participants come back to track.

And sometimes just a quick reminder that development of every skill demands practice over time and that the participants have learned many skills thru life can have an effect of support.

## Germany

- **Group characteristics**

The target group in Germany consists of two classes of 17 older refugees each, who learn the German language in a vocational college and all the prerequisites so that they can then achieve German vocational qualifications in secondary classes.

Many of the migrants will never return to their home countries. A significant proportion are traumatised by the flight because they have experienced violence and death there, many have lost family members.

More than 50% of the target group have no school-leaving qualifications and some are even illiterate. They are therefore alphabetised in a foreign language (German). This double handicap makes it difficult for them to understand the German language, which they first have to learn to write. Few of them were only able to sign their names at the beginning, but were otherwise unable to write longer texts, let alone read them out fluently after a while.

The general education can be described as poor.  In any case, they are not considered "digital natives" because, apart from searching general topics and making phone calls or small text messages, they cannot even begin to make use of the possibilities of their technical devices. Topics such as security, advanced use of email and use of a browser are only poorly developed.

The migrants are highly interested and curious to expand their possibilities, but sometimes awkward in training and trying out methods and software that are new to them. And comprehension in the German language is still problematic. However, the groups help each other in understanding the requirements of the teachers and trainers.

- **Obstacles and motivations**

Particular problems are the low level of education, partial literacy and sometimes illiteracy, psychological stress and worries about their families back home.

One of the biggest obstacles is the infinitely high expectations. The migrants believe they can understand and implement everything immediately. They are sometimes prevented from doing so by their level of education and by their age, which slows down the learning process. The resulting impatience sometimes leads to aggression, which is not properly assessed by the people concerned and unfortunately often projected onto the teachers. These class and learning processes were or are usually successfully accompanied by social workers and usually also solved. This also hinders and slows down the achievement of learning goals.

Furthermore, the financial, psychological and spatial conditions at their places of residence in the city or in the countryside hinder free thinking and learning at school or in their supervising institution.

- **How to approach and support them**

In our school we educate a high number of migrants and have developed a multi-faceted approach that produces consistently good results in working with migrants, also in the area of ICT. Here we provide the main elements of our approach.

In order to be able to face all the obstacles in the learning process in a goal-oriented and problem-solving way, the mentors and teachers use a variety of methods. peer-learning" and different forms of group work are some examples. Educational staff is invested in the situations and needs of migrant learners and is in constant dialogue with them. The dialogue is honest and migrants are seen as equals who can contribute to our understanding and improvement of the learning process. Our staff has been building the understanding of migrants needs since 2016 and is still gathering and comparing new experiences. This makes us responsive and adaptive as educators. Language education is at the centre of everything, special care and time is devoted to explanation of terms and context, ICT terminology included. Because of linguistic obstacles more time is devoted to individual topic and the quality of learning outcomes is prioritised over speed.

Parallel to this, social workers and psychologists accompany the work of mentors and teachers sporadically and as needed.

## Poland

- **Group characteristics**

In the target group, 15 people received support, mainly unemployed and economically inactive people, from a county in the Lodz region, where the agricultural structure predominates. Lodz region, where agrarian structure dominates, there is poor access to services, such as training in new technologies in a sparsely populated areas, where the ability to operate and use new communication technologies is very important. The age ranged from 25 to 53 years old. All were from rural-urban areas, had primary and secondary education, most were women, 9 out of a group of 15.

- **Obstacles and motivations**

The group was poorly self-motivated, the main barrier being the effect of the threat of social exclusion, poor education, communication and economic exclusion. For these reasons, the training was organised in Leczyca, a city less than 60 km from Lodz. Besides, NAVICULA.M, cooperates very closely with the local Labor Office in implementing projects against social exclusion. The motivation to delve deeper and learn how to use devices that help in communication using Internet technology came later.

It was only when individuals began to understand that a smartphone could be used not only to watch tic-tac-toe but also to look for a job, send the location of one's location, receive emails and send, make attachments, record videos of classes to repeat material, receive a presentation and save it to the phone, take photos of the presentation and for presentations, then motivation increased in them. In general, the group should be characterised as poorly motivated to learn, to expand their horizons.

- **How to approach and support them**

A very important element of support for the group was the conversation before the pilot training with career counsellor and adult educator Anna Kornat. Each participant had up to an hour of consultation, mainly talking about training and gaining new knowledge of ICT skills took place during the development of the individual action plan. Incidentally, this is a recommendation for the pilot training, that individual action plans accompany the ICT training preparation path, which requires a special approach of the educator, and the way to work with the group.

The support itself was implemented in two days, a day of preparatory support and ICT, implementation of a module on the ability to use a smartphone or tablet in creating short videos and editing them, extensive use of cataloguing photos, searching for important content on the Internet using a search engine, payments.

Of course, the basic question is the use of creative methods to teach the target group, the best solution is to learn through games, using various methods of work such as Kahoot.

**Spain**

- **Group characteristics**

The group of unemployed 20-45 year olds is highly diverse, as it is made up of individuals who have grown up with technology and use it on a daily basis for different purposes. This group shows a strong interest in technology and uses it for a variety of activities:

- Work: In today's labour market, the internet and technologies are increasingly present, making digital skills indispensable. This group faces the demands of the labour market, which requires constant updating in order to become more competent at work and access better job opportunities. Mastering digital skills is essential to thrive in an increasingly digitised and highly competitive work environment. This is not possible without first possessing good basic ICT skills, the lack of which deprives numerous individuals of many job opportunities.

- Education: In recent years, education has undergone a transformation, with online and distance learning gaining popularity by offering greater flexibility. Therefore, the group's members see online training as an option to improve their education and thus have access to more and better job opportunities. Through the many online educational platforms, participants can acquire new knowledge and skills at their own pace and from anywhere, allowing them to combine various activities in their daily lives. In addition, there are many and varied courses on the Internet on different topics, allowing them to customise their learning according to their interests and career goals. Similarly to employment, individuals without enough ICT skills can't take advantage of these educational opportunities.

- Leisure: Participants use ICTs in their free time to entertain themselves, communicate with others, shop and carry out various activities. For example, many purchases are made online, taking advantage of the convenience of searching and browsing a wide variety of products and services without having to leave their homes. In addition, during the pandemic, messaging and video-calling applications became indispensable tools for keeping in touch with loved ones and friends, overcoming the physical barriers imposed by movement restrictions. This group also makes use of social networking and online content platforms to share interests, discover new forms of entertainment and access a wide range of audiovisual content. For those without strong basic ICT skills many communication and entertainment options are not available and if they are, they are not utilized fully.

  Most members of this group are familiar with ICT and, in many cases, can perform tasks and solve problems on their own. It is also often the case that they cant accurately assess the actual level of their skils and can be negatively surprised to find out that they can't perform some relatively basic tasks required for learning or work. This gap in skills is often made worse by the unstoppable advance of technology, new challenges arise that they have to deal with, and sometimes it is not easy for them to find solutions. In addition, there are more and more new electronic devices and applications that, in some cases, require specific knowledge, such as the use of banking applications or administrative management. Despite the continuous changes in the world of technology, this group is interested in learning how to use new devices and applications that facilitate their tasks, improve their education or offer them other forms of entertainment.

- **Obstacles and motivations**

As mentioned above, technology is continuously advancing, posing new challenges for ICT users. Some of these challenges are outlined below:

- Need for constant adaptation: With so many advances and new devices, learning how to use them must be constant, as they are quickly integrated into different aspects of our lives. In most cases, this learning does not require much effort, but it does take time, as the fast pace of technological advances can cause some to feel overwhelmed or lag behind and lose interest in learning how to use ICTs.

- Autonomous learning: Many of the participants have learned to use ICTs autonomously and unsupervised, which can lead to inefficient problem solving or lack of knowledge of easier solutions. This

is because, while the ability to learn on one's own can be beneficial, there is also a risk of acquiring incomplete or incorrect knowledge. In addition, lack of supervision can limit opportunities to receive constructive feedback and to learn best practices in the use of ICTs.

- Information overload: this group spends many hours using ICTs and connected to the internet, which means that they are constantly surrounded by information. Information overload can lead to information overload and make it difficult to filter, process and select truthful information. This can lead to dispersion of attention, lack of concentration and difficulty in discerning between reliable and unreliable sources.

Despite these obstacles, the group is aware of the need for digital skills in today's times and how these skills benefit both their personal well-being and their professional development. These are some of their motivations:

- More and better job opportunities: Today, possessing digital skills is seen as an important advantage for finding employment and aspiring to better opportunities. Technology is increasingly integrated into aspects of our daily lives, including the workplace, and those who are familiar with it are more adaptable and can access more jobs.

- Continuous learning: ICT provides access to more resources and materials for learning about different subjects. This allows participants to expand their knowledge and skills throughout their lives, keeping up to date and prepared for the changing challenges of the work and personal environment. Continuous learning through ICT enables them to keep up to date in an ever-changing world and gives them a competitive advantage in the labour market.

- More options for communication and collaboration: thanks to the different digital tools, participants can connect and work with other people even if they are miles away and at any time. By having more options for communication and collaboration, participants can take full advantage of the benefits of technology to expand their network, boost creativity and achieve more efficient results in their tasks and projects.

- Inclusion and participation in society: Today's society is increasingly digitised and a large part of interactions, services and activities take place online. Participants are aware of the importance of having digital skills to actively and responsibly participate in this digital society, exercising rights, expressing opinions and contributing to public debate on online platforms

- **How to approach and support them**

To better determine the profiles and needs of this group, whether in terms of work or education, it is important to adjust the approach to teaching ICT to their situation and characteristics. Those more interested in using ICTs for education will want to learn about tools and resources that extend and facilitate learning, while those focused on the workplace will seek to acquire knowledge about using ICT in the workplace, as well as other skills to develop their digital capabilities.

While both groups have a common goal of using ICT for their personal development, be it educational or work-related, it should be made obvious to them that digital skills and the use of ICT are necessary and in demand in our daily lives, making them a perfect ally in both work and training. ICT is here to stay and knowing how to use it will make our daily lives easier and open up more opportunities.

That is why for ICT learning to be efficient, challenges should be designed to resemble real-life situations and provide examples and practical applications in different work and educational contexts. This will help participants to understand how they can use ICT effectively in their daily lives and in future employment opportunities. Interactive and participatory learning should also be encouraged, involving participants in practical activities and fostering collaboration among them. This can be achieved through group discussions, practical exercises, case studies and teamwork. In addition, it is important to take advantage of available

digital tools and resources that enable participants to learn in an active and autonomous way.

Since this group is already familiar with ICTs and how to use them, it is advisable to propose more advanced challenges that focus more on the latest ICT updates and how they integrate and change our lives. This will allow them to keep updating and exploring new technological possibilities.

## 11.Pilot trainings – country reports

### Slovenia

We conducted our pilot with seven seniors, six women and one man. They knew how to use the mouse, they said they know how to use emails, some of them occasionally used skype to communicate with friends and family. Searching for information on the internet, saving files and similar tasks was not something they can do well.

Our goal from the beginning was not for every learner to become proficient in all the skills contained in a given module because their knowledge and time constraints did not allow that. What we wanted is for everybody to at least gain an understanding of the steps needed to complete it, to improve their understanding of how the technology works and what it allows us to do.

Our seniors were the most interested in modules number 1, 2 and 4, 5 and 6 to which we devoted the most time.

We could describe their knowledge like this: they have some basic skills that are fragmented. They are not able to connect them in a series of ICT actions or upgrade them to the next level. They have hard time imagining how digital technology works. They lack confidence to try something new which limits their learning ability.

In challenge 1 they had trouble saving the attachments from email to their computer and finding them. Most were not able to do that on their own and there was an extensive conversation about »where do the attachments go when we save them«. This showed that they have trouble understanding the »where they are in the computer« and »how to move around«.   After the discussion, proposition and selection of ways to complete the challenge there was a sense that they understand better. Practically they were able to complete most of the tasks with some support from the teachers.

They were also enthusiastic to learn how to use USB devices to transfer files. They were surprised to find out how the USB »becomes a part of the computer«. This was a good lesson in practicality of ICT.

In challenge 2 we used WhatsApp to send photos to people and groups. They recognised how finding and attaching photos is similar to using attachments in an email. Creating a group and deleting it after was more difficult.

For on-line communication we used Skype and Googlemeet to talk to people. Establishing a single call was doable for most of them but they did not know how to do a group call or share a screen.

On average they had the most knowledge about fb which we tried as an example of social media use. This demonstrates the narrow focus they have as ICT users. They again saw a connection between adding a picture to a post to using attachments which was a nice observation showing that they can connect previously disconnected pieces of information if they observe them closely enough.

In on-line shopping we simulated a shopping attempt in a well-known on-line store. They wanted to try this as they have never bought anything online. They had trouble navigating the site as they are not trained well in on-line searching and search bars and key words are not well known to them. They had many questions about how on-line shopping works and especially about safety which was an important topic to cover.

The most obvious observation was how much the participants engaged in conversation and discussion of the modules and related ICT topics that emerged. The learners came alive when talking about their ICT problems and experiences. The y liked that ICT task were presented in a form of written challenges. They saw it as a story that they can think and talk about.

One of the learners made a comment: »Looking at computer use in a form of a written task helps me think about the task in more than one way. It is also easier for me to imagine the usefulness of ICT knowledge«. Interaction between the learners and the teachers occurred quite easily.

Approximately two weeks after the end of the pilot we conducted a short test to see how much they learned. They mostly reported that they feel they are better able to think about ICT use and that it makes more sense to them. They were not able to actually practically complete the challenges fluidly on their own but they were able to do some smaller part of the challenge like save a file on USB or take a photo and send it to a friend on WhatsApp. They were able to describe most of the steps that ned to be done in an understandable way, showing a greater level of understanding of the process.

It was also evident that they need more practical training and repetition to be able to work independently but that was expected given the level of their overall knowledge. At the same time, it was obvious that they in general had a better mental picture of what needs to be done.

They also commented on the overall experience being an interesting and engaging for them as learners. They reported being more relaxed during the sessions because it was not only about the clicking.

## Croatia

We organised our workshops in the town of Sisak and the participants were 10 women with an average age 40 and we were greeted warmly. All the participants use ICT on a daily basis mostly for communication and they were curious to learn more.

The topics of the modules we devoted the most time to were: Social media and Online services.

We started by introducing ourselves and were interested to hear some general information from the participants about their experiences and attitudes toward ICT. For all women, the major motivation for learning was a belief that with their improvement in ICT skills, they would be able to connect and communicate with family and friends easier and become more skilful in participating in online group communication. We were also discussing how many services like making an appointment with the doctor, shopping, bank transfers could make life simpler by using ICT.

The trust was established by open communication from the beginning and ice breakers games were the path to a more relaxing atmosphere and opening for trying out new ICT actions. All participated and it was visible how participants went more into the flowing.

The presentation and the discussion about the challenge went smoothly and participants could connect what was said to their everyday life situations. For most of the participants, the challenges were easy to solve, they were very engaged and openly shared their solutions. There were also some very creative ideas on how to explain to someone else what actions need to be taken to solve the challenge.

From the feedback, we got that the workshop was fun and useful experience and generally the participants would agree to be engaged in some similar activities.

## Germany

We conducted the test series with 17 older migrants, 11 of them women and 6 men. 3 women have difficulties reading and writing fluently. The trainings took place in a mixture of German, English and French because the clients come from Syria, West Africa and Central Africa.

All of them have regular contact with their families in their home countries. This contact takes place on different communication platforms and is therefore very different: Skype, WhatsApp and platforms unknown here and also via email.  But the main communication takes place via video connections or audio files. And mobile phones are still the main hardware they use, rather than computers, iPads, notebooks, etc., although most of them now own them.

Many did not know how to attach to emails, how to edit pictures or how to do simple internet research. The skills of these 17 older migrants were very differently distributed, which is why they were divided into three small groups for intensive support and training and some partial trainings were repeated up to 3 times.

A particularly big challenge was how to back up photos and files to a more permanent medium than the mobile phone. Furthermore, the different possibilities of social media (e.g. group conversations as audio or in writing, deleting and adding friends, etc.) were usually relatively unknown or accompanied by uncertainty.

Especially when using the browser, considerable problems were visible, even when they used the browser's translation functions. This refers to internet research, use of online banking as well as online shopping.

In the tests about 3 weeks after the pilot trainings, it could be seen that the security had increased significantly. From our point of view, this is due to the fact that we had carried out the pilot trainings up to 3 times. And this is also a very important finding:

Older migrants with language difficulties and little IT experience need two to three times the time for this training.

It was confirmed to us (personally and via the evaluation results) that the printout of the different modules and instructions are very helpful and a great support for the training at home.... We have the impression that regular repetitions contributed to the fact that the migrants were very satisfied with the training.

## Poland

NAVICULA.M has been cooperating with the District Labor Office in Łęczyca for many years, and has conducted a number of competency training courses for the unemployed, as well as for professional foster families and alumni of these families on behalf of the Office. Leczyca is a city located 60 km from Lodz. In March in the training room of the Labor Office, a pilot training course was held with the participation of 15 people from the target group, among whom people with secondary education predominated.  These people had medium or low digital competencies. They can operate a smartphone and tablet, send text messages, browse the web, take photos and send them to other users.  Problems people in the target group have with setting up an email inbox on a phone or tablet, sending emails with attachments, searching for and sharing places on Google map, marking places, mapping a driving route, and using more advanced applications. They also have trouble making payments.

The pilot classes, attended by people from the target group, lasted 5 hours, during which the proposed creative teaching exercises were discussed and the selected teaching methods were tested. The following scope of creative teaching was tested: operation of a smartphone, tablet, extensive use of google maps, sending emails, sending photos, shooting short videos, cataloging photos, finding important content on the Internet through a search engine, payments.

Participants said it was worthwhile to meet and expand their knowledge and discover new functions of the devices.

The classes were conducted by Anna Kornat and Igor Mertyn - trainers from NAVICULA.M

## Spain

In December 2022 Neotaletway organised the workshops for testing the modules of the creICTivity project. A total of 9 unemployed people between 20 and 45 years old participated in the workshops which were primarily focused on the modules about fundamentals of windows and e-mail use and the module online communication.

The pilot training group was a diverse group and some of the participants already knew how to use the technologies because they have grown up with technology and use it often for both leisure and work, so they already have some basic knowledge and are able to solve problems on their own. However, other participants utilize technology only sometimes, and even if they are competent problem-solvers on their own, they struggle to locate an immediate fix.

The sessions were developed in a similar way, starting with some ice-breaker games followed by the explanation of the modules and the posing and solving of the challenges posed to the participants The session

was very interactive and the participants were very collaborative in solving the challenges. In addition, it was noticeable that some knew more about some things than others, but thanks to the different challenges there was an exchange of knowledge and experiences that enriched the sessions. To check the effectiveness of the sessions, the participants carried out two evaluations, one before and one after the workshops. Thanks to these evaluations, participants were able to share with us their opinions and experiences and we were able to know that they enjoyed these sessions. They also commented that the sessions helped them to realise their level of use of the technologies and those aspects in which they do not have all the knowledge they thought they had.

Both in the participant surveys and in the mentoring session, participants showed interest in ICT and wanted to learn more advanced knowledge such as Artificial Intelligence, cybersecurity or the influence of ICT on decision making. This showed that when teaching about the use of ICT, it is necessary to know the context of the participants and take into account the possible problems they may face in order to pose challenges that are more similar to the problems that may arise in everyday life with the use of ICT.

Taking all this into account, the teacher added some additional elements to the modules to peak the interest of the participants. The topic of the modules stayed the same, but the "challenge" was modified to describe a work related situation and some more twists were added in the form of new and harder scenarios to compensate for the fact that the learners largely grew up with ICT and have at least some skills. This approach ensures that participants remain engaged and motivated throughout the learning process. In the case of this target group it is also suggested to add the newest and very relevant topics such as Artificial Intelligence, cybersecurity and the influence of ICT on decision-making. In this way the teacher can provide more advanced knowledge that aligns even more with their aspirations.


## Conclusion

Creativity is something we all talk about a lot. We use the term very loosely to describe different people and things we find exceptional. What creativity is, is largely a matter of personal taste and opinion, yet clearly, creativity is something that we all know when we see it. But do we really?

It seems that frequent use of the word creativity has actually removed us from its essence because we popularised the term so much that it has somewhat lost its meaning. During the project we wanted to get closer to the essence of creativity, at least from the educational perspective. We wanted to understand what are the building blocks of creativity and how educators can rearrange them to bring that creative spark to the often formulaic learning process of adult education.

Observing and describing creativity as a result of certain methods, skills and attitudes that the learners and the teachers bring to the learning process takes some of the mystique away from it and moves it closer to certain skills like teamwork. We say team work because allowing creativity to enter the learning process is very much a team effort by the learners and the teachers.

What we wanted to show is that creativity is at the core of many skills essential for better quality learning; reflection, critical thinking, problem solving and more. All of these skills are present when teachers give the learners an invitation to be creative and the learners accept it.

Educators and all who value creativity in education must be aware that creativity manifests differently in each learner; a small qualitative shift in the thinking about and understanding of a topic like ICT can actually mean that the learner has discovered a lot of new connections and patterns about the topic and that is a sign of a lot of creativity on their part.

The point of thecreICTivity learning process is exactly this; to help learners engage higher level thinking skills – in line with their abilities – and through this not only obtain but also create a more flexible and durable knowledge they can use in practice. Even the smallest steps in this direction are important for the learners.


We hope that this and other project results we created will motivate the educators to take some time and learn about creativity and increase their capacity to use it in their educational work.

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# SECTION 2: creICTivity LEARNING MODULES AND CREATIVITY ENHANCING GAMES

## INTRODUCTION

CreICTivity learning modules and creativity enhancing games were created in the framework of the creICTivity project as examples of learning content that promotes creativity and engagement of learners in the process of ICT education.

They are a part of the creICTivity learning process that engages the adult learners by inviting them to reflect on the use of ICT, allowing them to co-create the learning process and to approach ICT skills as challenges that need to be examined and solved.

The process is based on the Creative Problem Solving (CPS) model, recognised as the most effective approach for creative learning. The model is described in more detail in a companion document entitled **Using creativity to support adults in ICT education - Teaching methodology for adult educators.** The document ties together the concept of creativity with the use of creativity in ICT education to improve learning outcomes of adult learners who often struggle understanding ICT.

Although the basics of the process are provided in this document, **we strongly recommend** that all educators who wish to use the modules and games read the companion document on methodology to better understand how creativity can be fostered in ICT education of adults.

# 1. creICTivity in A NUTSHELL

CreICTivity learning process is not so much creative education as it is **education for creativity**. Its goal is to help the learners use higher-level cognitive processes like analysis, critical thinking and problem solving to understand ICT and its use better.

The process consist of 7 steps[1] that allow the teachers and adult learners to define the lack of ICT skills, examine and reflect on the challenges that ICT presents and find solutions to them.

## 1) Identify the problem

The teacher tries to find out which ICT skills adult learners are lacking and wish to improve. The teacher uses discussion, different types of questions and their previous experiences with the target group to gather the desired information.

## 2) Research and clarify

Once the teacher has identified the problem or problems, it is time for a deeper research that will clarify them better. This can be effectively done using the **Design thinking method**. The method with individual steps and needed resources is presented in the Design thinking workshop guidebook that was also created by the creICTivity project and is freely available for download. If the teacher is confident that enough information was obtained in step 1, Design method can de skipped, but it is advisable to implement it if possible.

## 3) Formulate creative challenges

After the information obtained during the Design thinking activity is known, it is used to create corresponding ICT challenges. Formulating a challenge as a starting point of creative learning is extremely important. The modules presented here already include the challenges but new challenges can be prepared by educators based on the information gathered in step 1 and 2. How the challenge is constructed is described in chapter 4.2 of the methodology for adult educators.

## 4) Reflect on the challenge

With this step, the work with the group of learners actually begins. Reflection allows the learners to »spend some time« with the challenge before engaging with it practically. By reflection we mean discussing and analysing the challenge in a group setting with support of the ICT teacher.

## 5) Generate ideas

We believe ICT knowledge is only useful if it can be used in in a proper context. This is why we designed our ICT learning modules around a challenge. A challenge demands that the learners understand not only individual ICT commands but also how they work in a sequence, what results can be expected when we execute them etc. The learners must try to find one or more viable solutions tom the challenge. For this, the learners must use divergent thinking. If the learners are able to find more than one viable solution, this is a sign of creative thinking process.

## 6) Implement solutions

In this step the solutions reached in step 4 and 5 are tried out in practice. The teacher repeats the challenge and the actions needed to solve it. Then he demonstrates the actions and the learners repeat them. Real-time dialogue and comments are needed here to check understanding and progress of the learners. Mistakes should be examined and used as learning opportunities.

## 7) Reflect and generalise

Lastly, the learners reflect on the learning experience by answering questions like *Which new ICT skills did you learn? How useful was your previous knowledge? What was the biggest realisation for you?* The teacher asks them to think of scenarios where new gained knowledge would be useful to deepen their knowledge understanding and retention.

Steps 4 to 7 are the ones where the learners and the students directly analyse the problem, search for solutions and practically try them out. These steps deserve special attention and are summarised below in more detail in terms of activities, methods and outcomes.

.......................
1       *The steps are described in more detail in chapter 5 of the methodology for adult educators.*

| STEP OF THE PROCESS | OUTCOME | ACTIVITY | METHOD |
|---|---|---|---|
| Reflection on the challenge | • Better understanding of challenge content<br>• Better awareness of own ICT skills and shortcomings<br>• Examination of personal "habits of mind" | The learners and the teacher discuss the challenge and try to connect it to previous ICT experiences of the learners and also to understand its purpose | • Group discussion<br>• Experience sharing<br>• Critical reflection |
| Generate ideas | • Finding one or more viable practical solutions to the challenge | The teacher guides the learners to solutions of the module by asking guiding questions ad helping them formulate the steps they need to take to complete the challenge. | • Group discussion<br>• Peer-to-peer learning<br>• Ideation<br>• Critical evaluation of ideas |
| Implement solutions | • Testing the solutions in practice to gain new ICT skills and understanding their usefulness | Teacher demonstrates ICT skills to students and they repeat, questions are asked and answered, mistakes are examined and explained. | • Group work<br>• Individual work<br>• Learning-by-doing<br>• Peer-to-peer learning<br>• Demonstration |
| Reflect and generalise | • New gained knowledge is reflected upon and evaluated<br>• New situations where to use the knowledge are found to generalise the knowledge | Teacher asks questions about the learning experiences, what attitude changes they had, do they know where they can use new gained knowledge etc. | • Group discussion<br>• Experience sharing<br>• Brainstorming<br>• Ideation |

During the implementation of the steps, the teachers and the learners must follow the following principles.

- **Interactive learning**

Interactive learning comes from active participation and interaction between the teacher and the learners who both contribute to the process of learning. It depends the most on the teacher and his approach. The teacher must, among other things, **encourage the learners to ask questions, be focused on the problem, not the solution and encourage communication**.

- **Co-creation of the learning process**

Co-creation goes beyond active participation and it means that the learners actively create the learning process and its results. CreICTivity allows this at several stages of the learning process. Co-creation empowers the learners and invites them to think about ICT contextually.

- **Understanding the challenge**

To foster creativity education must not only offer answers to the problems but also be focused on understanding the problem or a challenge. Understanding the challenge demands that the learners observe the broader context and engage their critical thinking skills. This helps form new connections between concepts and creates new and better knowledge.

# 2. ABOUT THE MODULES AND CHALLENGES

The modules included in this document are built around an ICT challenge. In creICTivity learning process the challenge is the focus and starting point for learning. Various other types of information pertaining to the module like learning goals, outcomes, methods and more are added.

- **Title and description:** At the beginning, the title and a short description place the module in a real-life context and describe why the skills contained in the module are important.

- **Key elements of the module:** It contains the challenge or in some cases two. It also presents the main topics and skills contained inside the challenge and learning outcomes. Auxiliary topics are topics that should be mentioned in connection to the challenge because of their usefulness but are not necessary for completing the challenge.  Very important part are **concepts that should be grasped** by the learners and **attitude shifts** that should be achieved. **These two categories present the change of perspective and insight that education for creativity can bring.**

- **Additional information:** This part contains some helpful information like recommended group size and some questions that can be discussed and answered during the learning session to provide a direction for reflection and ideation. Learning outcomes and results are described in more detail.

- **Work plan overview**: It provides a condensed summary of ICT skills covered in the challenge and desired learning outcomes. The process is also described in terms of activities that reflect the steps of the creICTivity learning process. Preparation and materials needed are added to help avoid unnecessary delays in the process. Due to the flexible nature of the learning process, durations provided for each activity are suggested estimates that can vary somewhat from group to group.

The challenge presented in Key elements of the module is the most important part of each learning module. The challenges presented here were prepared based on suggestions from our target group members and on our experiences as adult educators. At the same time, we wanted to cover an array of basic ICT skills that should be acquired by anybody who lacks basic ICT skills.

The threads that connect the modules are the ability to share content across various platforms and devices and the importance of knowing how to search for information on-line. We believe these skills are the basis for better understanding of ICT as a whole and further learning.

It is important to understand the purpose of the challenge to be able to more effectively complete the steps of the creICTivity learning process and foster creativity in adult learners.

In the context of creICTivity every challenge has three purposes.

**Firstly**, it puts the ICT content of the module in a form of a relatable every-day situation. It helps the learners with zero or very low understanding of ICT to put abstract ICT terms and tasks into practical context. It serves as a kind of purposeful task.

**Secondly**, the challenge engages the learners by presenting to them (a useful) challenging situation they need to complete. It peaks their curiosity and desire to be up to the challenge. It works on individual level as everyone wishes to be able to complete the challenge and do it quicker than the others but it also promotes group work, peer-to-peer learning, sharing of experiences etc. as sometimes it is better to work together as a group to complete a challenge.

**Thirdly**, presenting learning content in a form of a challenge fosters creativity and problem-solving skills, thus improving learning outcomes and knowledge retention.

Presenting and examining a set of ICT skills in a form of a practical challenge gives the educators an opportunity to encourage the learners to actively co-create the learning process by expressing their views, fears, obstacles and expectations about ICT and by examining the challenge and reflecting on it in a practical context. These are the most important factors for fostering creativity.

In order to complete it, the learners must – with support and help from their teacher – analyse, de-construct, re-imagine and re-interpret the challenge. They must use higher level thinking skills such as critical thinking,

practical or applicative thinking, questioning, idea generation, analysis, synthesis, all of which lead to better ability to solve practical problems (of ICT variety or other), resulting in the ultimate goal of creICTivity project – better ICT skills and more practical creativity.

## 3. PROFILE OF THE TEACHER AND THE LEARNER

The goal of education for creativity is to achieve qualitative shift in the way adult learners think about the topic of ICT. They gain the ability to think and act more independently when faced with ICT challenges and adapt to new information without being stuck in their "habits of mind".

This type of change is easier to achieve if the learners and teachers possess certain predispositions. The characteristics listed below are not strictly necessary but they will lead to a better learning experience and results.

**The learners:**

- Have the minimum of ICT skills, like how to use the mouse

- Have tried using ICT before, have some experience to share

- Have personal motivation to improve their ICT skills

- Are naturally inquisitive

- Are attentive learners

- Like to interact and communicate


**The teacher:**

- Is curious and inquisitive by nature

- Sees learning as more than just absorption of facts

- Cares about the learners and can empathise with them

- Understands the value and basics of creativity

- Is willing to invest time and energy in the preparation and the learning process

- Is willing to give the learners enough space to express themselves

- Is ready to relinquish some part of control over the learning process in favour of interactive learning

- Understands the value of mistakes

- Understand that he/she must guide the learners toward knowledge and not give it to them

- Can appreciate small positive improvements in skills and knowledge of the learners and is willing to build on them

# 4.PREPARATION

Before the start of the learning activity, it is necessary for educators to do some preparation as creICTivity learning process follows a set of rules and steps that should be implemented in a certain way for optimal results.

- Familiarise yourself with the concept of creativity and the role of creativity in education. This is described in chapters 1 and 2 of the methodology for adult educators.

- Read about the role creativity plays in the creICTivity learning process. This is described in chapter 3 of the methodology for adult educators.

- Learn about the methodology and steps of the creICTivity learning process in chapters 4 and5 of the methodology.

- If you decide to choose one of the modules presented here, study the challenge, main topics, and learning outcomes and prepare according to preparation instructions provided in the work plan. The module should be simple enough for a teacher to solve but make sure that you know how to solve it before the start.

- If you plan to create your own challenge, more adapted to the needs of your learners, study the guidelines for preparation of the challenges in chapter 4.2 of the methodology for adult education.

- Preparation of learning materials with instructions for learners is not necessary as this will lead them to the solution of the ICT challenge and limit their need for creative thinking.

# 5. THE MODULES

## Module 1: "Framing baby pictures" - Transferring selected pictures using e-mail or USB device

This module was created with ICT needs of seniors in mind but is very relevant to all adults with low ICT skills. Everybody has most likely found themselves in a situation when they needed to send some kind of files to someone as an attachment or to transfer some digital content using external USB devices. Nonetheless, this relatively easy task can be a challenge to adults and seniors with low ICT skills.

Not knowing how to perform this kind of ICT task severely limits the ability of ICT users to exchange information, communicate, create and learn in an effective and meaningful way.

Performing these tasks demands knowledge and understanding of many basic concepts related to ICT like saving files to a specific location and finding it, selecting files, using copy-paste, adding attachments, using USB external devices etc. If adult learners can learn them, they will gain an ability to be much more autonomous and active ICT users as well as set of basic ICT skills that are applicable to almost any situation involving daily use of ICT.

Even if they know how to perform many or all of the steps needed to complete the main task, many adult learners see them as solitary steps and do not understand well how they connect to one another in a real-life scenario. To provide more context and underline the connection between them, we incorporate them in a very relatable challenge. This challenge has two parts. Both do not need to be completed but we recommend finishing the first part of the challenge before doing the second part.

The module will guide the learners to discover and test a number of basic ICT skill needed for independent ICT use and further learning.

### Receiving and saving emails

An essential skill that allows low ICT-skilled adults to communicate and share content. It is the first step towards connecting with family and friends.

### Downloading and uploading attachments

Necessary skill for any email user. Expands the ability to share more than simple text. Understanding attachments also teaches the learners about working with files and is useful with other common communication applications used today.

### Finding files on a computer

Locating files is a common problem for adults with low ICT skills. Learning it will teach them how to navigate a computer and will allow them to manage their files more efficiently.

### Using USB devices to transfer files

Learning to use USB devices will demonstrate to the learners that there are different ways to transfer content and that ICT device can connect to other devices.

In the process, they will also gain a better understanding of the characteristics of the Windows operating system which is one of the biggest obstacles adult learners face when using ICT.

## Key elements of the module

### Auxiliary topics

Importance of passwords

Saving items to reconsider

Ways of paying

Card safety

On-line safety

How to spot suspicious on-line sellers

### The challenge

#### No. 1

»You would like to search a special item and you heard that a well known on-line store is the place where you can buy it. What must you do to search for the specific item? «

#### No. 2

»Now you need to choose which one is the best for you and you would like to add to your search price, colour etc. How would you do it? «

### Main topics and skills

Opening an on-line store website of choice and search for an item
  Main elements of typical on-line store website
  Using search box

Navigating thru offers
  Finding details about items
  Applying search filters

Choosing an item
  Choosing filters and apply them
  Payment options

### Concepts to grasp

There are uncountable items on online shopping pages

You can search whatever you wish

As much as clear you are what you are searching, it is more possible you will find it

You can save items and decide later

### Learning outcomes

Opening online service page

Finding a search box

Searching for an item

Filtering by different criteria

Choosing an item and check-out

### Attitude shift

ICT Self-esteem (I can learn ICT; it is a skill not a mystery)
Problem solving attitude (I can analyse, understand and solve problems)
Self-organization (I can be more independent and save time)
Stronger motivation to search the internet for useful items
Less fear of on-line scams, more realistic attitude towards on-line shopping

### Notes

| | |
|---|---|
| Target group/learner profile | Seniors and adults who:<br><br>• Know how to use the mouse and double-click function<br>• Have an e-mail address and know how to access it<br>• Have trouble understanding how to use attachments in an e-mail and in general<br>• Have trouble saving files in a specific location<br>• Have trouble finding saved files<br>• Have trouble with navigating Windows<br>• Dont know what are USB devices and how to use them<br>• Have trouble understanding multi-step nature of some ICT operations |
| Group size | From 4 to 8 learners |
| Some questions for discussion, ideation and reflection | What does it mean to transfer photos? What options do we know for transferring photos? Where do the photos go when we save them on a computer? How do we know what our location is in the computer at any time? How do we move photos from place to place? Is USB part of our computer? Why is it useful to share photos? What else can we transfer in the same way as photos? What else can be sent or received as an attachment? |
| Benefits of the learning outcomes and results | Skills contained in this challenge will help adult learners understanding that digital data is easily transferable and is not "static" and limited to just one device (computer). They will understand that being able to create and exchange content like photos, texts etc. makes the use of ICT much more meaningful and improves the ability to communicate and learn.<br><br>They will become more motivated and independent ICT users. Their creative potential will increase, as they will be able to share their various creations with friends and family. |

| WORK PLAN OVERVIEW | | | | | |
|---|---|---|---|---|---|
| CONTENT | LEARNING OUTCOMES AND GOALS | ACTIVITIES[2] | METHODS | PREPARATION /MATERIALS | DURATION OF THE ACTIVITIES[3] |
| 1) Introduction and creative warm-up games<br><br>2) Basics of the Windows operating system<br><br>3) Presentation of the challenge[4]<br><br>4) Receiving and sending emails<br><br>5) Downloading and uploading attachments<br><br>6) Finding files on a computer<br><br>7) Using USB devices to transfer files | • Creating a group atmosphere and connection, preparing the learners to think creatively<br><br>• Being familiar with the basic elements and structure, windows, folders, moving files etc.<br><br>• Familiarise the learners with the challenge to solve, start the creative problem solving process<br><br>• Knowing to open received email, starting a new email, adding recipient, sending the email<br><br>• Understanding what attachments are, adding attachments to emails, opening and downloading received attachments<br><br>• Basic orientation in Windows, finding a file in a specific location<br><br>• Knowing the purpose of USB devices, connecting USB devices, accessing the content, moving the content between different devices | a) Short presentation of the teacher and the learners, playing various creativity supporting games<br><br>b) The teacher briefly presents the Windows operating system and its main features<br><br>c) The teacher presents the challenge, puts the challenge in a real-life context, describes that the challenge contains various skills that will be learned by solving it<br><br>d) The learners and the teacher try to understand the challenge, propose possible steps to solve it, select the best steps challenge, propose possible solutions<br><br>e) The learners with support from the teacher practically try out the solutions<br><br>f) The learners try to find similar scenarios where the same steps could be used, evaluate the knowledge try to generalise the knowledge gained | • Verbal presentation, group activity<br><br>• Verbal presentation, description, practical demonstration<br><br>• Verbal presentation, storytelling, contextualising<br><br>• Reflection, experience sharing, experience based learning, brainstorming, analysis, problem-solving, evaluating, critical thinking<br><br>• Practical work, practical demonstration, peer-to-peer learning, learning-by-doing<br><br>• Evaluation, reflection, synthesis, generalisation | • All participants must have an email account and know the password; an account can be created for them if they do not have it yet.<br><br>• All participants must have a laptop or desktop computer at their disposal<br><br>• Internet connection must be available, network and password written for all to see<br><br>• Flipchart, pens, paper etc. for creative games (depends on games selected) | 15 minutes |
| | | | | | 15 minutes |
| | | | | | 15 minutes |
| | | | | | 30 minutes |
| | | | | | 60 minutes |
| | | | | | 15 minutes |
| | | | | | 15-minute breaks are recommended after activities c) and e).<br><br>An additional creativity enhancing game can be added after activity c). |
| | | | | | Total time: approx. 180 minutes |

## Module 2: "Using my phone to share memories and meet friends" - Sharing photos, videos and location using a smartphone

This module is about the most commonly used features of smartphones outside of making calls. Even though smartphones are today everywhere, many adults are still limited to mostly making calls. This is primarily because they did not "update" their view of the phone as a capable ICT device. The module addresses this by presenting a smartphone as a combination of a phone and a computer. Adult users often do not understand what applications are, where to find them and how to use them. This prevents them to access many useful features that will make their phone a useful tool for communication and content creation.

The topics of making and sharing photos and videos are appealing to people of all ages and are a great way to demonstrate the working of applications and to show how content can be easily shared between people. Determining and sharing a location is another challenge that many adults face and can benefit greatly by learning this skill. The themes are commented by the use of sharing applications, presenting the ability to share various types of content.

The topics are meant to give adults useful basic skills and in this way increase their interest to become more versatile smartphone users, trying out different applications and sharing their creativity with others. By learning, the basics of using the camera and replaying photos and videos adults will be able to make their first steps in content creation and gain new ability to share their creativity with other people.

The challenge contained in this module is designed to guide the learners to discover a number of useful skills connected to the use of smartphones.

### Taking photos/videos on a smartphone

While most user know how to take photos, there are still some that are not comfortable using the camera on a smartphone, especially for making videos. There are also some simple actions the users can take to improve their photos and videos that low ICT-skilled adults do not know about.

### Finding photos and videos

Finding photos and videos is often not easy for some smartphone users. Learning this skill is needed for all other actions like sharing the photos and videos created.

### Sending/sharing photos and videos

Sending and sharing content is useful for not only presenting your creative talents but also for sharing everyday information like locations, written documents and more. It saves time and makes communication and socializing easier in today's world. Every user can benefit from these skills and turn their smartphone into a useful tool.

### Finding and sharing location using navigation and a major communication app

Most low ICT skilled adults are not aware of the practicality of navigation options available with smartphones. This function can significantly shorten their commuting and make spatial orientation easier. This is especially useful when they go to a city they are not familiar with and maybe don't have the ability to. The learners will also gain useful skills about how to use and manage various applications on the smartphone allowing them to try various useful tools and services.

## Key elements of the module

### Auxiliary topics
Using on-screen keyboard
Deleting photos and videos
Updating applications
Rotating the screen
Using internet browser
Accessing e-mails

### Concepts to grasp
Photos and videos are just data that can be sent and received
Data can be saved on devices and accessed again later
Mobile phone is excellent for capturing photos and videos
Sharing of photos and videos can be quick and easy
We can share our content with multiple people at once
My smartphone helps me finding

### The challenge

No. 1

» You have been at a meeting with friends in which you have taken several photos as a souvenir. One of your friends has asked you to share the photos with the rest of the members through instant messaging and has asked you to share the files through him. What should you do to share the photo to all your friends at once?

No. 2

» This time you are going to meet your friends again in the city of Maribor. They have never been to the city, so they ask you to share your geolocation to find you quickly. How can you do it?«

### Learning outcomes
Knowing how to record photos and videos
Knowing where to find them on the phone
Knowing to share photo and video content
Knowing to find and share geographical location
Knowing how to use and manage apps

### Main topic and skills

Taking photos/videos on a mobile
Taking pictures with your phone
Recording sound and video
Displaying photos, playing videos

Finding photos and videos
Finding pictures/picture gallery
Finding videos

Sending/sharing photos and vids
Most common apps for sharing
Selecting photos/videos to share
Selecting one or more recipients

Finding and sharing location
Finding location in a popular application
Sharing location with individuals or groups

### Attitude shift
Proactivity (I can use ICT to create and share my content)
My (smart)phone offers many options that I should explore in more depth
I am connected to others even when I am not behind my computer

### Notes

## Additional information

| | |
|---|---|
| Target group/learner profile | Adults who: <br><br> • Have a smartphone but are limited in its use to making calls <br><br> • Have an interest in making photos and videos but don't know how <br><br> • Wish to share photos and videos with friends and family <br><br> • Wish to make their daily commutes and travel easier by using navigation <br><br> • Have a desire to improve their ability to use and manage smartphone apps |
| Group size | From 4 to 8 learners |
| Some questions for discussion, ideation and reflection | How is smartphone similar to a computer? What can we do on a smartphone and the computer? Where do photos and videos go after we make them? What are applications? How do we activate an application on a smartphone? |
| Benefits of the learning outcomes and results | The learners will gain skills to create photo and video content and share it, allowing them to share their activities and experiences with people close to them. They will also find new way to show and improve their creativity through photo and video content. <br><br> On a deeper level, they will better understand and be able to use sharing applications to share not only photos but also other types of files and content. They will understand that ICT allows connectivity between different types of devices. This realisation will be useful in their professional and private life. <br><br> They will become more confident users with the desire and improved capacity to expand their smartphone usage also on their own. |

# WORK PLAN OVERVIEW

| CONTENT | LEARNING OUTCOMES AND GOALS | ACTIVITIES[5] | METHODS | PREPARATION/MATERIALS | DURATION[6] |
|---|---|---|---|---|---|
| 1) Introduction and creative warm-up games | • Creating a group atmosphere and connection, preparing the learners to think creatively | a) Short presentation of the teacher and the learners, playing various creativity supporting games | • Verbal presentation, group activity | • All participants must have a smartphone | 15 minutes |
| 2) Basics of smartphone use | • Knowing basic abilities of the device, searching for apps on the device, moving apps on a screen, installing and removing apps | b) The teacher briefly presents the smartphone and its abilities and various uses | • Verbal presentation, storytelling, contextualising  • Verbal presentation, description, practical demonstration | • Internet connection must be available, network and password written for all to see  • If possible, ensure that the teacher's smartphone screen is mirrored on a bigger screen for demonstrations | 15 minutes    15 minutes    30 minutes |
| 3) Presentation of the challenge[7] | • Familiarise the learners with the challenge to solve, start the creative problem solving process | c) The teacher presents the challenge, puts the challenge in a real-life context, describes that the challenge contains various skills that will be learned by solving it | • Reflection, experience sharing, experience based learning, brainstorming, analysis, problem-solving, evaluating, critical thinking | • Flipchart, pens, paper etc. for creative games (depends on games selected) | 60 minutes    15 minutes |
| 4) Taking photos/videos on smartphone | • Being able to activate the camera, take photographs and videos with the camera | d) The learners and the teacher try to understand the challenge, propose possible steps to solve it, select the best steps challenge, propose possible solutions | | | 15-minute breaks are recommended after activities c) and e).  An additional creativity enhancing game can be added after activity c). |
| 5) Finding photos and videos | • Being able to locate the gallery of photographs, to access individual photos and videos and open them | | • Practical work, practical demonstration, peer-to-peer learning, learning-by-doing | | Total time: approx. 180 minutes |
| 6) Sending/sharing photos and vids | • Knowing to locate and open the correct app, adding a photo or video as an attachment to share, choosing recipients, sending photos and videos | e) The learners with support from the teacher practically try out the solutions | • Evaluation, reflection, synthesis, generalisation | | |
| 7) Finding and sharing location | • Knowing how to access location in a sharing app, how to send it to a recipient | f) The learners try to find similar scenarios where the same steps could be used, evaluate the knowledge try to generalise the knowledge gained | | | |

# Module 3: "Information is only a click away"- Internet browser, searching information and safety

During the CreICTivity Module 3 a tailored journey designed to empower older migrants and seniors in harnessing the challenges of the internet while prioritizing their safety and comfort. In this segment, we understand that embracing technology may feel like embarking on an unfamiliar adventure. However, rest assured, this module will guide you every step of the way, recognizing your unique needs and concerns.

## How to browse for information

Our primary goal is to equip older migrants and older people with the skills needed to navigate the digital realm confidently. In today's interconnected world, the internet can be a treasure trove of information and a powerful tool for communication and staying informed. We will gently guide you through the process of finding valuable information swiftly and efficiently using keywords within the three major web browsers.

## Searching and using special websites for special needs

Furthermore, we understand that accessing specific websites may be an essential part of the target group's online journey, whether it is reconnecting with family and friends, accessing healthcare information, or exploring hobbies and interests. We will provide the target group with the knowledge to access these sites based on provided web addresses, ensuring that you stay connected with ease.

## Address book for important websites

Additionally, we will introduce our target group to the convenience of saving websites for quick and easy access in the future. This feature can simplify your online experience and make it more enjoyable and efficient.

## Secure browsing

We recognize that online safety is of paramount importance. Therefore, we will guide the clients through the process of employing user-friendly apps to unlock websites, ensuring that you can access content securely and with peace of mind.

Moreover, we will emphasize the importance of vigilance in the digital realm, especially for older adults. We will help them recognize and avoid potentially hazardous websites, empowering them to safeguard their online presence. The module 3 will also cover essential security features to protect your personal information and digital assets effectively.

Many older individuals may lack familiarity with digital tools and concepts. Learning to use web browsers, search engines, and other online re-sources can be challenging. Overcoming this initial digital literacy barrier is crucial to effectively navigate the internet.

Older adults may be less familiar with online safety practices and may be more susceptible to online frauds, phishing, or other cybersecurity threats. Educating them about recognizing and mitigating these risks is essential to ensure their online safety and security.

The module 3 remembers that no one is alone in the internet. It is the mission to make the internet accessible, enjoyable, and secure for older migrants and other clients. By the end of this module, the target group will not only be a proficient navigator of the web but also a vigilant guardian online security.

## Key elements of the module

### Auxiliary topics
Importance of passwords and their regular exchange
Structure of the Windows operating system
Knowledge about some level of professionalism of websites, hidden functions and especially handling of security and personal data
Cookies

### Concepts to grasp
Using the different browsers.
Information search - effectively using search engines.
Know how to enter website addresses to access specific sites.
Saving favourite websites for quick access.
Recognizing secure websites and be aware of online risks.
Using apps with focus on online experience and security.
Identification and avoiding potentially dangerous websites.
Know how on managing privacy settings in browsers and websites.

### The challenge
No. 1

"You have many hobbies and are trying to find websites about them for latter quick access."

No. 2

"You have found some websites but now you must remove annoying advertisements that offer you potentially dangerous links to click on."

### Learning outcomes
Proficient use of web browsers
Effective online searching
Using websites with URLs.
Website security
Ability in using apps
Avoidance of potentially dangerous websites
Knowledge of basic online safety and privacy protection

### Attitude shift
Increased confidence
Digital independence
Awareness of online safety
Appreciation of online resources
Adaptability
Engagement with digital communities
Problem-solving skills
Cautious digital citizenship
Resourcefulness
Improved motivation
Lifelong Learning

### Main topic and skills
Functions of a browser
    Main elements and functions of web browsers
    Searching for web sites

Using hyperlinks
    How to recognize a hyperlink
    Ways to open a hyperlink
    What we can do with hyperlinks

Function and structure of webpages
    Basic layout of a webpage
    Navigating a webpage
    Searching for content on a webpage
    Saving found web sites for later access

Pop-ups, safety
    How to recognize pop-up
    Dangers of pop-ups
    How to deal with opened pop-ups
    How to stop and prevent pop-ups

### Notes

| | Additional information |
|---|---|
| **Target group/learner profile** | **Seniors and adults who:**<br><br>• Have low Know how to use the browser<br>• Have trouble understanding how to use a browser<br>• Don't know how to save useful websites<br>• Have trouble finding saved files<br>• Have trouble with navigating through the web.<br>Have trouble understanding multi-step nature of some ICT operations with browsers. |
| **Group size** | From 4 to 8 learners |
| **Some questions for discussion, ideation and reflection** | Are there individuals among you who hesitate to embrace technology due to fear or unfamiliarity? How do cultural beliefs and norms influence your attitudes toward technology and online behaviour? Do you perceive a significant generational gap in technology adoption between you and younger family members or peers? What concerns do you have regarding online privacy and security? Are there individuals in your community who resist adopting technology in favour of more traditional methods? Do you face challenges accessing necessary devices or internet services due to limited financial resources? How might health issues affect your ability to use digital devices comfortably? How does the process of integrating into a new society affect the challenges of learning digital skills? |
| **Benefits of the learning outcomes and results** | The learning outcomes for "CreICTivity Module 3: Internet browser – searching information and safety" for older migrants and seniors include:<br><br>• Proficient use of web browsers like Chrome, Firefox, and Edge.<br>• Effective online searching using search engines.<br>• Ability to enter and access websites using web addresses (URLs).<br>• Skill in bookmarking and organizing favourite websites.<br>• Awareness of website security and the ability to identify secure sites.<br>• Competence in using apps to enhance online experience and security.<br>• Recognition and avoidance of potentially dangerous websites.<br>• Knowledge of basic online safety practices and privacy protection.<br>• Competence in managing privacy settings in browsers and websites.<br>Awareness of available online support and resources for seniors. |

| | | WORK PLAN OVERVIEW | | | |
|---|---|---|---|---|---|
| CONTENT | LEARNING OUTCOMES AND GOALS | ACTIVITIES[8] | METHODS | PREPARATION /MATERIALS | DURATION OF ACTIVITIES[9] |
| 1) Introduction and creative warm-up games<br><br>2) Basics of web browsers and websites<br><br><br>3) Presentation of the challenge[10]<br><br>4) Functions of a browser<br><br><br>5) Function and structure of webpages<br><br>6) Using hyperlinks<br><br>7) Pop-ups, safety | • Creating a group atmosphere and connection, preparing the learners to think creatively<br><br>• Knowing the intended use of web browsers and websites and the difference between them<br><br>• Familiarise the learners with the challenge to solve, start the creative problem solving process<br><br><br>• Being able to activate the browser, know the main elements, use basic/common functions<br><br>• Knowing the most common layout elements, navigating the website, finding content, saving pages to bookmarks, recognising harmful websites<br><br>• Recognising hyperlinks, knowing ways to open them, recognising potentially harmful links<br><br>  • Knowing what pop ups are, recognising various pop-ups, dealing with open pop-ups, how to prevent pop-ups from showing, safety tips for browsing the web | a) Short presentation of the teacher and the learners, playing various creativity supporting games<br><br><br>b) The teacher briefly presents the usage of web browsers and websites and how they are different<br><br><br>c) The teacher presents the challenge, puts the challenge in a real-life context, describes that the challenge contains various skills that will be learned by solving it.<br><br>d) The learners and the teacher try to understand the challenge, propose possible steps to solve it, select the best steps challenge, propose possible solutions<br><br><br>e) The learners with support from the teacher practically try out the solutions.<br><br><br>f) The learners try to find similar scenarios where the same steps could be used, evaluate the knowledge try to generalise the knowledge gained | • Verbal presentation, group activity<br><br>• Verbal presentation, storytelling, contextualising<br><br>• Verbal presentation, description, practical demonstration<br><br>• Reflection, experience sharing, experience based learning, brainstorming, analysis, problem-solving, evaluating, critical thinking<br><br>• Practical work, practical demonstration, peer-to-peer learning, learning-by-doing<br><br>• Evaluation, reflection, synthesis, generalisation | • All participants must have a laptop or personal computer<br><br><br>• Internet connection must be available, network and password written for all to see<br><br><br>• Projection option must be available for the teacher to demonstrate<br><br>• Flipchart, pens, paper etc. for creative games (depends on games selected) | 15 minutes |
| | | | | | 15 minutes |
| | | | | | 15 minutes |
| | | | | | 30 minutes |
| | | | | | 60 minutes |
| | | | | | 15 minutes |
| | | | | | 15-minute breaks are recommended after activities c) and e).<br><br>An additional creativity enhancing game can be added after activity c). |
| | | | | | Total time: approx. 180 minutes |

# Module 4: "Digital encounters" - Video calls and their functionalities

In today's digital world, the ways to connect and communicate with others have multiplied. Thanks to the number of electronic devices available such as mobile phones, laptops and computers, we have at our disposal a wide variety of means of communication that allow us to communicate with others in a simple way. Generally, the most widely used way to communicate is video calling which has emerged as a powerful tool that overcomes geographical barriers and allows us to bridge distances and stay close to those we care about most. In addition, video calls have established themselves as an essential tool in remote work, giving the possibility to keep teams connected.

On the one hand, thanks to knowing how to handle video calls we can connect with our loved ones both by computer and mobile, improving relationships and communication skills. Moreover, knowing how to handle video calls effectively not only allows people to connect and develop fluid communication, but also improves their overall digital skills. On the other hand, video calls are invaluable in professional environments, as they facilitate remote work, collaboration and virtual meetings, increasing productivity and efficiency.

Thus, embracing this technology equips us with valuable skills in both personal and professional settings, enriching our lives in ways that were previously unimaginable.

This module will focus on exploring the functionalities and potential of ICT in the contemporary world, more specifically on the utilities and advantages of video calls. It will cover topics such as the installation of programmes and applications to make video calls or their effective use in different areas, whether social, professional or family. The main objective is to enable participants to learn about the most suitable programmes or applications for making video calls and to choose those that are best suited to them according to their individual needs and specific purposes.

Through the exploration of the challenge, the learners will learn and contextualise the following ICT skills:

**Establishing online video call**

They will learn about the most accessible and commonly used video call applications and what options they offer. They will know to access one of the major application and establish a video call with one or more people. These basic skills will allow them seriously expand their ability to connect with friends, family, co-workers and others, improving their social and professional life.

**Managing video call tools**

They will learn the purpose of most useful tools and features such as screen sharing, chat and inviting additional participants. In this way, their ability to present content and engage in teamwork will improve, making their video calls more productive.

**File management in video calls**

They will learn that various types of files and content can be shared with video call participants and how this is done. This will again improve the quality of their calls and improve their ability to share important content with friends, family but also co-workers, enabling productive teamwork.

## Key elements of the module

### Auxiliary topics
Finding files on a device
Etiquette of on-line video calls (muting when not speaking, raising hand)

### Concepts to grasp
Communication possibilities in different contexts
ICT allows simultaneous meeting of multiple people
On-line video calls allow sharing of different types of content
On-line video calls allow co-working and co-operation
Distance is no obstacle with on-line video calls

### The challenge

No. 1

»You have a group of friends with whom you want to contact for a long time. You have their phone numbers, but you would like to do a video meeting with them, so you can see them all at once. What could you do to hold that meeting? What steps would you follow?«

No. 2

» This time, you are having the group video chat with your friends. These ask you to share childhood photos through the group you have created. What options exist for it? Note that this depends on the program used«

### Learning outcomes
Be able to establish an individual or group call
Manage audio and video settings
Know how to locate files and share them through an online communication program

### Main topics and skills
Establishing online video call
  Main online communication applications
  Having a conversation with sound and video
  Managing sound and video
  Creating an online meeting group

Video call tools
  Sharing the screen and files
  Using the chat option
  Inviting participants

File management in video calls:
  What can be sent
  How to add and send an attachment

### Attitude shift
  Stronger motivation for on-line socializing
  Problem solving attitude (I can analyse, understand and solve problems)
  Proactivity (I can use ICT to create, share and store my content)
  Benefiting from technology: ICTs make everyday life easier

### Notes

| | |
|---|---|
| **Target group/learner profile** | **People from 35 – 60 years old who:**<br><br>• Have some basic ICT skills<br><br>• Have only passively participated in video calls<br><br>• Know how to take pictures and share them<br><br>• Don't know how solve some issues<br><br>• Don't know the full potential of technologies and devices.<br><br>• Have trouble with some ICT operations |
| **Group size** | From 5 to 8 learners |
| **Some questions for discussion, ideation and reflection** | Do you know how to establish an online connection with one or several people using one of the main communication applications? Do you know how to have a conversation with sound and video? Can you share your screen and files using the chat option and invite more participants to the meeting? |
| **Benefits of the learning outcomes and results** | Learners will learn how to use the applications to make video calls with ease and will be able to get the most out of them. They will be able to be in a meeting with more people where they will also be able to use the camera and sound. Another technical setting that they will also be able to use is to share their computer screen with the other participants in the call. In these video calls, participants will learn how to use another functionality of the video calls, the chat where they will be able to send messages, images and videos.<br><br>Knowing how to use video calls will help them not only in their social daily life but also in their training or work, as these are basic skills needed nowadays. Their ability to communicate will increase significantly as a result. Participants will learn about the functionalities of ICT and this will motivate them to learn more about them and to be able to incorporate them into aspects of their lives to facilitate their daily lives and in this case to facilitate communication with others. |

| | | | | | |
|---|---|---|---|---|---|
| WORK PLAN OVERVIEW | | | | | |
| CONTENT | LEARNING OUTCOMES AND GOALS | ACTIVITIES[11] | METHODS | PREPARATION/MATERIALS | DURATION OF ACTIVITIES[12] |
| 1) Introduction and creative warm-up games | • Creating a group atmosphere and connection, preparing the learners to think creatively | a) Short presentation of the teacher and the learners, playing various creativity supporting games | • Verbal presentation, group activity<br><br>• Verbal presentation | • All participants must have a laptop or personal computer with working camera and microphone | 15 minutes |
| 2) Introduction to on-line video calls | • Basic understanding of the purpose and abilities of on-line video call applications | b) The teacher briefly introduces main purpose and features of most on-line video call applications | • Verbal presentation, storytelling, contextualising | • Internet connection must be available, network and password written for all to see | 15 minutes<br>15 minutes<br>30 minutes<br>60 minutes<br>15 minutes |
| 3) Presentation of the challenge[13] | • Familiarise the learners with the challenge to solve, start the creative problem solving process | c) The teacher presents the challenge, puts the challenge in a real-life context, describes that the challenge contains various skills that will be learned by solving it | • Reflection, experience sharing, experience based learning, brainstorming, analysis, problem-solving, evaluating, critical thinking | • Projection option must be available for the teacher to demonstrate<br><br>• | 15-minute breaks are recommended after activities c) and e).<br><br>An additional creativity enhancing game can be added after activity c).<br><br>Total time: approx. 180 minutes |
| 4) Establishing online communication | • Knowing the most widely accessible and easy to use video call applications, establishing connection with video and audio, adjusting video and sound, creating a call for a group | d) The learners and the teacher try to understand the challenge propose, possible steps to solve it, select the best steps challenge, propose possible solutions | • Practical work, practical demonstration, peer-to-peer learning, learning-by-doing. | • Flipchart, pens, paper etc. for creative games (depends on games selected) | |
| 5) Video call tools | • Knowing to share the screen and display content, chat and inviting new participants | e) The learners with support from the teacher practically try out the solutions | • Evaluation, reflection, synthesis, generalisation | | |
| 6) File management in video calls: | • Sending and sharing various files with call participants | f) The learners try to find similar scenarios where the same steps could be used, evaluate the knowledge try to generalise the knowledge gained | | | |

## Module 5: "Sharing family vacation photos" - Transfer the selected photo from your smartphone to Facebook.

Many people have a need to share their happy family moments captured in the photos with other family members and friends. Now, when smartphones have the option to take photos, this is very easy for some but some may struggle. The last is true for some adults who lack ICT skills. In addition, there can be many unpleasant feelings around the limitations they experience when they cannot share events that are meaningful for them. Furthermore, by offering others special moments in photos, much information and communication may not be exchanged.

Performing the task of sharing family vacation photo on Facebook demands basics as knowing how to take a photo and having a Facebook account and how to open the profile, which item to click, select a specific photo to publish and choose the visibility of the photo. These ICT actions are all necessary and we expect that learners will have high motivation to learn how to perform them all.

As mentioned above, to share family photo to Facebook is necessary to have an account. In case, some of the learners do not have it, we incorporated to the challenge that activity first and later on, we are dealing with the photo. If the learners have Facebook account already, the first part of the challenge can be skipped.

Through examination of this module, the learners will learn a number of useful skills related to the use of smartphones and Facebook:

### Using Facebook chat

Many adults are not aware of the usefulness of the chat function for direct real time conversations. This will open another communication channel to them, making them better connected to friends and family.

### Selecting a photo on smartphone

Selecting photographs from a gallery is a basic skill for sharing photo and video content, allowing users to share important content with others. This seemingly simple skill still escapes many inexperienced smartphone users.

### Uploading photo on Facebook profile

Uploading a photo is an important mechanics that improves the user experience and effectiveness of using Facebook. It also teaches general principles of uploading attachments. The users will also learn how to add description to the photo.

### Choosing privacy setting and publishing the photo

Choosing who sees your content is important for effective communication. It helps reach specific recipients better. This is a useful but not always well-understood step in publishing content on Facebook. It can also protect users for sharing something that is not intended for general public.

# Key Elements Of The Module

## Auxiliary topics

Taking photos on a smartphone

Editing photos

Importance of passwords

Privacy settings

Facebook structure

## Concepts to grasp

Photos are just data that can be sent and received

Photos taken are saved automatically in folders and you can access them

Facebook is social network and you can chat and share content with others on it

You can choose privacy setting and edit your photo

There is a logic using ICT

With internet we are connected with more than just friends and family

## The challenge

No. 1

»You would like to connect with your friends and family on Facebook. You have to have an account and start chatting with somebody.«

No. 2

»You took some family vacation photo and would like that all your Facebook friends see it.«

## Learning outcomes

Chatting to Facebook friends

Select a photo you prefer

Upload photo on Facebook

Awareness that you choose what and how will be visible to others

## Main topics and skills

Using Facebook chat
    Opening Facebook profile and find a chat icon
    Starting a conversation to a Facebook friend

Selecting a photo on smartphone
    Opening file where photos are saved
    Select the photo

Uploading photo on Facebook profile
    Find an icon on Facebook to upload the photo
    Describe the photo if wish

Choosing privacy setting
    Find an icon to choose privacy setting and choose it
    Upload the photo

## Attitude shift

Stronger motivation to be active on fb and expand your social network

ICT Self-esteem (I can learn ICT; it is a skill not a mystery)

Problem solving attitude (I can analyse, understand and solve problems)

Proactivity (I can use ICT to create and share my content)

## Notes

| | |
|---|---|
| **Target group/learner profile** | **Adults who:**<br><br>• Have a smartphone and a fb profile<br><br>• Want to share something on their FB page but don't know how<br><br>• Have trouble understanding social networks<br><br>• Have an e-mail address and know how to access it<br><br>• Know how to take a photo and find it<br><br>• Have people they know on Facebook<br><br>• Have trouble edit the photo and privacy setting |
| **Group size** | From 6 to 12 learners |
| **Some questions for discussion, ideation and reflection** | What is a social media network? How does it function? What does it mean to start a chat? What does it mean to share photos? How is possible to have photo on your smartphone and others to see it on their smartphone? Why privacy setting is important? What will happen if you change your mind and want to change privacy setting? |
| **Benefits of the learning outcomes and results** | With new gained skills the learners will improve their social interaction and their user satisfaction will improve as they could share happy (or some other) moments in their life to friends and family. They will be more independent ICT users and their self-esteem and creativity will grow. |

| WORK PLAN OVERVIEW | | | | | |
|---|---|---|---|---|---|
| CONTENT | LEARNING OUTCOMES AND GOALS | ACTIVITIES[14] | METHODS | PREPARATION/ MATERIALS | DURATION OF THE ACTIVITIES[15] |
| 1) Introduction and creative warm-up games<br><br>2) Basics of Facebook (chat, posts)<br><br>3) Presentation of the challenge[16]<br><br>4) Using Facebook chat<br><br>5) Posting a photo from smartphone to Facebook | • Creating a group atmosphere and connection, preparing the learners to think creatively<br><br>• Being familiar with the basic elements and structure, smartphone icons, folders, Facebook, chat, moving files, etc.<br><br>• Familiarise the learners with the challenge to solve, start the creative problem solving process<br><br>• Basic orientation on Facebook, knowing to open the chat and start communication<br><br>• Knowing which functions to use to post a photo on Facebook, find and select a photo from smartphone, edit photo to Facebook and choose privacy settings | a) Short presentation of the teacher and the learners, playing various creativity supporting games<br><br>b) The teacher briefly presents the Social media (Facebook)<br><br>c) The teacher presents the challenge, puts the challenge in a real-life context, describes that the challenge contains various skills that will be learned by solving it<br><br>d) The learners and the teacher try to understand the challenge, propose possible steps to solve it, select the best steps challenge, propose possible solutions<br><br>e) The learners with support from the teacher practically try out the solutions<br><br>f) The learners try to find similar scenarios where the same steps could be used, evaluate the knowledge try to generalise the knowledge gained | • Verbal presentation, group activity<br><br>• Verbal presentation, storytelling, contextualising<br><br>• Verbal presentation, description, practical demonstration<br><br>• Reflection, experience sharing, experience based learning, brainstorming, analysis, problem-solving, evaluating, critical thinking<br><br>• Practical work, practical demonstration, peer-to-peer learning, learning-by-doing<br><br>• Evaluation, reflection, synthesis, generalisation | • All participants must have a Facebook account and must know how to log in<br><br>• All participants must have some photos on their smartphones.<br><br>• Prepare a scenario or a story to present "the challenge" | 15 minutes |
| | | | | | 15 minutes |
| | | | | | 15 minutes |
| | | | | | 30 minutes |
| | | | | | 60 minutes |
| | | | | | 15 minutes |
| | | | | | 15-minute breaks are recommended after activities c) and e).<br><br>An additional creativity enhancing game can be added after activity c). |
| | | | | | Total time: approx. 180 minutes |

14      Activity d) corresponds to step 4 and 5 of the creICTivity learning process, activity e) corresponds to step 6 and activity f) corresponds to step 7.

15      Due to the open-ended nature of the interaction between teacher and the learners, durations listed here are proposed but can vary somewhat depending on the intensity of the discussion and number of solutions proposed and examined.

16      Only the challenge is presented and not also the content of the module. In this way the learners will not get any clues and will think only about the challenge they need to solve.

## Module 6: "Finding that special item in an on-line store" - Search, filter and choose an item using online service

For many different reasons, sometimes going shopping is not possible. People can be sick or have no time for shopping. Alternatively, maybe wish for some item that is not selling in the shops near us. In all those situations, online shopping can be the answer.

However, not knowing how to use ICT and perform some ICT actions could be limiting.

Online shopping is a service that some people use regularly, but some have their own reasons why they do not for example people are afraid of fraud or enjoy physically going into the store more. However, for whatever reason, having the skill to shop online is useful no matter if will it be used or not.

To shop online, firstly is important to know some basics like navigate webpages, search for items, filter items, and choose the items. In addition, those actions are what we are going to teach. Additional would be discussion on how to pay with a card[17] and how to choose a delivery service.

Adult learners who are not familiar with ICT usually are afraid that they will click something unintentionally so we prepared two challenges that will support them in experimenting and learn online shopping in fun and easy way.

This module contains necessary skills needed for on-line shopping. Working on the challenge the learners will learn how to:

### Opening an on-line store and searching for items

Basic searching for a desired on-line store can be done in different ways and produce different results. Some useful tips about search words and best results can make this process easier. It is also useful to know how a typical on-line store is structured, where is the search option and how to use it.

### Navigating thru offers

Searches for items usually produce many hits. It is useful to know how to narrow your choice with various filters. This mechanics is not well known to unexperienced on-line shoppers. It is also useful to be able to understand where and how the information about items is displayed.

### Choosing an item

The final step of a purchase is choosing and paying. Here the learners will learn how to put the items in the shopping basket, add or delete them. Typical on-line payment options will be discussed and demonstrated without actually paying, as on-line payment is unknown to many unexperienced on-line shoppers.

Because on-line shopping hides many potential dangers, misleading add and fraudulent sellers, topics of on-line payment safety and how o recognise potentially dishonest stores will be discussed with the learners.

---

17      Payment is not actually done. A fake card is used to simulate the buying procedure.

## Key elements of the module

### Auxiliary topics

E-mail safety, spam, and phishing

Importance of passwords

Renaming files and folders

Copy-paste

Structure of the Windows operating system

### Concepts to grasp

Photos are just data that can be sent and received

Data can be saved on devices and accessed again later

It is important to know where our data is saved

There is a logic behind saving and finding data on a device

ICT can be used to solve practical situations

There can be multiple steps to complete a task

With internet we are connected with more than just friends and family.

### The challenge

#### No. 1

»A relative sent you an e-mail with some photos of their new-born baby. You wish to have some of the photos developed and framed. You have to select the best photos and somehow transfer them to the photo studio.«

#### No. 2

»Internet connection is not working. You have to transfer the photos to the photo studio without using the internet«

### Learning outcomes
Ability to send and receive e-mails

Managing attachments

Using USB devices to transfer files

Finding files on a computer

Better orientation in Windows operating system

### Main topics and skills

Receiving and sending emails
    Main elements of a typical email account
    Creating a new message
    Email address and sending the message

Downloading and uploading attachments
    What are attachments
    How to download an attachment
    How to add an attachment

Finding files on a computer
    Basics of Windows structure
    Where downloads usually go
    How to find a specific location on a computer

Using USB devices to transfer files
    What are examples of USB devices
    How to connect USB devices to a computer
    How to find USB devices on a computer
    Transferring files to and from SUB devices

### Attitude shift
    ICT Self-esteem (I can learn ICT; it is a skill not a mystery)
    Problem solving attitude (I can analyse, understand and solve problems)
    Proactivity (I can use ICT to create and share my content)

### Notes

| | |
|---|---|
| **Additional information** | |
| **Target group/learner profile** | **Adults who:**<br><br>• Know how to use the mouse and double-click function<br><br>• Have an e-mail address and know how to access it<br><br>• Do not know how to use search and filter operations<br><br>• Want to save time (and often money)<br><br>• Want to be more independent<br><br>• Want to have something that cannot be bought in regular shops nearby |
| **Group size** | From 6 to 12 learners |
| **Some questions for discussion, ideation and reflection** | What is your attitude towards online shopping? What are the possible benefits? What is important to be aware of? How can you have some items in your shopping bag and come to it later? What if you change your mind? |
| **Benefits of the learning outcomes and results** | Learners will become familiar with online services and understand how they function. They will understand how to search and filter items according to different criteria. Safety risks discussion will make them less vulnerable to frauds. They will definitely become more independent and save time and often money by using online services. We will also discuss the attitudes towards online services so we expect they will use online services more often in their everyday lives. |

| WORK PLAN OVERVIEW | | | | | |
|---|---|---|---|---|---|
| CONTENT | LEARNING OUTCOMES AND GOALS | ACTIVITIES[18] | METHODS | PREPARATION/MATERIALS | DURATION OF THE ACTIVITIES[19] |
| 1) Introduction and creative warm-up games | • Creating a group atmosphere and connection, preparing the learners to think creatively | a) Short presentation of the teacher and the learners, playing various creativity supporting games | • Verbal presentation, group activity | • All participants must have a smartphone | 15 minutes |
| | | | | | 15 minutes |
| | | | | | 15 minutes |
| | | | | • Prepare some ideas what learners can buy | 30 minutes |
| 2) Basics of online shopping | • Being familiar with the basic elements and structure of typical on-line shopping services | b) The teacher briefly presents one common online service and its main features | • Verbal presentation, storytelling, contextualising | | 60 minutes |
| | | | | • In case of advanced teaching (how to pay an item) all participants must have an e-mail address created (check if they know their password) and the mentor should prepare a printed fake bank card (the card that has all information as real card). | 15 minutes |
| 3) Presentation of the challenge[20] | • Familiarise the learners with the challenge to solve, start the creative problem solving process | c) The teacher presents the challenge, puts the challenge in a real-life context, describes that the challenge contains various skills that will be learned by solving it | • Verbal presentation, description, practical demonstration | | 15 minute breaks are recommended after activities c) and e).<br><br>An additional creativity enhancing game can be added after activity c). |
| 4) Searching preferred item | • Basic orientation on a typical on-line store page and starting to search for an item | | • Reflection, experience sharing, experience based learning, brainstorming, analysis, problem-solving, evaluating, critical thinking | | Total time: approx. 180 minutes |
| | • Knowing how to find details of the chosen item | d) The learners and the teacher try to understand the challenge, propose possible steps to solve it, sellect the best steps challenge, propose possible solutions | | | |
| 5) Navigating thru offers | | e) The learners with support from the teacher practically try out the solutions | • Practical work, practical demonstration, peer-to-peer learning, learning-by-doing | • Prepare a scenario or a story to present "the challenge" | |
| 6) Using filters, most common on-line payment options | • Knowing how to use filters for narrowing down the offer, choosing an item, being familiar with the most common on-line paying options | f) The learners try to find similar scenarios where the same steps could be used, evaluate the knowledge try to generalise the knowledge gained | • Evaluation, reflection, synthesis, generalisation | | |

18    Activity d) corresponds to step 4 and 5 of the creICTivity learning process, activity e) corresponds to step 6 and activity f) corresponds to step 7.
19    Due to the fluid nature of the interaction between teacher and the learners, durations listed here are proposed but can vary somewhat depending on the intensity of the discussion and number of solutions proposed and examined.
20    Only the challenge is presented and not also the content of the module. In this way the learners will not get any clues and will think only about the challenge they need to solve.

# 6. CREATIVITY ENHANCING GAMES

Games and creativity in the educational process play an important role in enhancing the learning experience of adults. While traditional educational methods can often be limiting and one-directional, play and creativity make learning more engaging and enjoyable, promoting in-depth understanding.

Games offers a natural learning environment for adults. During play, adults develop problem-solving skills, increase social interactions and explore thought processes using their imagination. For adults, play reduces stress, strengthens co-operation and communication and increases motivation to learn. With games, adults can develop creative thinking skills. It also supports their personal and professional development.

As a result, games and creativity in education enrich the learning experience and promote understanding that is more lasting. Games improves adults' problem-solving skills, social interaction and imagination, while creativity increases their ability to think differently and find new solutions. Play and creativity for adults support the efficiency of education and the creation of an enjoyable experience.

The games presented here were crated to stimulate creative thinking of adult learners on the topic of ICT. They can be used at the beginning of the learning activities as warm-up games or later in the learning process to prepare the learners for ideation to find solutions to the ICT challenges.

- All the participants raise index finger, middle finger and ring finger up. Index finger represents "name", middle finger represents "favourite drink" and ring finger represents "their favourite social media". While walking around the room, the participants touch the fingers of the people they meet with theirs and explain what the fingers represent in turn.

- Divided into teams of 5-6 people according to group size. Each team is asked to create a machine or item using their own bodies. What is required from each group is to decide on an item by discussing it among themselves and to present it in a way that other friends can understand by using their own bodies. It is very important that every person in the group is involved as part of the machine. Allow 15–25 minutes for groups to work, decide, and rehearse. Then, when they are ready, they offer their machines to everyone. The watching participants are also asked to name the machine. Besides having fun, it is a game that allows the participants to work together and to get closer to each other. A discussion environment can also be created at the end of the presentations.

- The game has only one rule: come up with the most ridiculous ideas possible. I ask the person who comes up with a solution to the question I asked, to sit in the middle chair and say his/her opinion. The more ridiculous the solution you describe; the more applause you will get. In this game, participants are encouraged to come up with the most different and absurd idea using their creative minds.

- Writing metaphors helps make thinking more flexible. Each participant is given a pen and paper. He is asked to write a metaphor about ICT.

  I am like a Computer. Because…

  I'm like a Facebook account. Because…

- Use the drama method. Give participants roles related to the topic you are going to be talking about. For example, you will tell about internet banking. For example; a person becomes a cell phone. The second person becomes the bank's mobile application. The third party is sending a money order within the mobile application. Roles are multiplied according to the number of participants. After the game, the subject is explained to the participants practically.

- Prepare algorithms related to the topic.

For example;

1. Open the Word file.

2. Turn on the computer.

3. Click the mouse.

4. Press the Save button.

5. Write text.

6. Add photo.

Rank the actions in the correct order

- In Mobile Phone Ideation participants split into groups and take 30 different pictures with their mobile phones. Then they create stories about the pictures taken as a group. The stories should be connected to the topic of ICT.

- Select a random word connected to ICT (for example; Facebook, WhatsApp etc.). Use this word, a random word above it and a random word below it to create a short story. Finding a way to create an interesting, cohesive story from seemingly random elements can improve your ability to make connections and combine ideas that do not necessarily relate.

## SECTION 3 : DESIGN THINKING WORKSHOP GUIDEBOOK

## INTRODUCTION

This handbook contains instructions and materials needed to conduct a Design thinking workshop on the subject of attitudes, needs, obstacles and motivations different target groups of learners have in regard to ICT.

Design thinking method is comprised of 6 activities that allow the participating adult learners and also ICT mentors to look at ICT from different perspectives. They can search for and define different important elements of the educational process that need to be changed, excluded or included into the learning process to make it better tailored to the needs of a specific group of learners.

The method relies on empathizing with the target group members to provide them with a way to understand their own needs better and the needs of their peers. It also uses ideation techniques like brainstorming to boost the ability of the participants to translate the insights they obtained into better defined practical solutions to the problems they perceive to have in regard to ICT learning.

Apart from helping the learners and the mentors to better define existing learning obstacles and even discover new unknown ones, the Design thinking method also fosters creativity by allowing the participants to use imagination and mental experimentation to solve problems. The creative angle is supported also by a number of creativity boosting warm-up games at the start of each activity.

The Design thinking method is a part of the creICTivity learning process. It helps the mentors to prepare better learning content and learning environment and it prepares the learners to start thinking creatively about the subject of ICT.

To learn how to use the handbook as a part of the creICTivity learning process, see the document Using creativity to support adults in ICT education - Teaching methodology for adult educators, chapter 4 and 5.

### Purpose of Workshop

Every person, knowingly or unknowingly, is included in continuous learning processes. Adults, especially, prefer to learn subjects that have a potential to directly affect their lives. For that reason, adults' learning process is based on their experiences and they prefer to determine the subject to learn on their own. The design thinking workshop is designed to allow them just that.

The 6 workshop activities take the learners through different stages of thinking about the topic of ICT.

**Activity 1** uses empathy map to help the learners and the teachers uncover the feelings and attitudes the learners have about ICT by asking a series of questions that trigger reflection and empathy towards the learners.

**Activity 2** introduces creativity to the learners and asks them to think creatively about ICT by making connections between seemingly unrelated items.

**Activity 3** allows the teachers to ask questions that are more specific about the obstacles the learners have regarding ICT and learn more about their needs and skills they lack.

**Activity 4** uses a fun form of brainstorming to propose some possible solutions to the problems defined in previous steps.

**Activity 5** asks the learners to propose "prototype" solutions to the problems they identified.

**Activity 6** is the testing of the solutions proposed. In practice, testing is best done by incorporating as many lessons learned during the Design thinking workshop into the preparation of the creICTivity learning modules.

Taken together, the activities are a form of engaging creative cognitive exercise that improves the learners and the teachers understanding of the needs of the learners. The learners become better prepared for learning new ICT skills and the teachers gain valuable understanding about the topics they need to include in the teaching process. The workshops allow a better definition of known obstacles and can also uncover hidden needs that the learners were perhaps not even aware of previously.

The Design thinking workshop is step 2 of the creICTivity learning process and its results should be used to prepare relevant and engaging ICT challenges tailored to the needs of various groups of learners.

## Action Plan

• Since activities included in this guidebook cover practices intended for both the mentors and the target group, conduct through two or more sessions is strongly recommended.

• Start every activity with a warm-up activity.

• Provide the participants with information about the activities before starting.

• Collect the results of each activity.

• In case you do activity more than a day, discuss what you have done in the previous activity.

## COURSE-1: UNDERSTANDING THE TARGET GROUP

### Purpose

Gain understanding of the target group's attitude and relation to ICT through empathy.

### Material

Empathy Toolkit

### For Whom

Mentors and Teachers

### Warm-up Game

**1**

We ask the participants to look at their mobile phones. Each participant chooses three photographs which they like the most and are then asked to tell the reasons for choosing these photographs

### Share your thoughts and emotions about your target group and ICT

**2**

• What is your opinion of ICT?

• What can we do for the harmony between humans and technology?

• In what way do you make contact with your family and friends) (face to face, mobile phone, social media and so on)

• What are the advantages of having strong skills and knowledge about ICT?

### Apply the toolkit we have prepared

*Annex-1 (Empathy Map)*

**3**

Adult learners and mentors fill in the empathy map together. Adult learners form groups of three. Empathy map in A3 size is printed and hanged on different parts of the classroom. Adult learners write answers to the questions on the empathy map on post-its and stick them on the empathy map. In addition, adult learners may add new questions.

The mentors will go around the groups and talk to the learners about their answers and the questions they added to try to understand them and their needs.

Empathy map in annex-1 can be adapted so the questions better fit the target group.

**Evaluate the activity**

The mentor evaluates the activity by asking the following questions to the participants. After this verbal evaluation, the mentor writes a short report about the activity.

- What did you feel?
- Did you like the activity?
- What did you realize?
- Were you able to attain the knowledge that you were looking for?

# COURSE-2: CREATIVE THINKING

**Purpose**

To Improve the Creative Thinking Ability of both the mentors and the target group

**Material**

**For Whom**

Mentors and Adult Learners

**Warm-up Game**

Getting to know and understand our adult learners is extremely important. The purpose of this warm-up game is to both getting people to know each other and share their experiences. Each participant should share three experiences that they had, and they would advise others to have. For instance, "You should certainly see Bled Lake" or "You should cross the Bosporus by a ferry" etc.

**Briefing about creative thinking**

- What is creativity? Why is it important?
- How do we need it in our daily lives?
- Can we improve creativity?

### Creative thinking exercises

*Annex-2*

An animal, a plant, and an object (preferably, those related to ICT) are chosen. First, all characteristics of the animal and the plant chosen are written down. Then we choose the object (related to ICT) and redesign it by considering the characteristics of this animal and plant. The result does not have to make complete sense. It is about finding new connections between characteristics.

| Example | | |
|---|---|---|
| *Animal* | *Plant* | *Object* |
| *Tortoise* | *Carrot* | *Phone* |
| *It moves slowly* | *It's orange* | *The phone we will design should be somehow related to the characteristics of the animal and the plant. For example, the phone should recognize and know its owner and it should be healthful. It may also be orange. It should send messages about the health of the owner. An application about easy cooking should also be installed.* |
| *It has a shell.* | *It prevents cancer.* | |
| *It lives long.* | *It grows under soil.* | |
| *It is possible to distinguish between the male and female tortoises.* | *It revives and beautifies the skin.* | |
| *They know their owner.* | *It is healthful.* | |
| *They need a wide space.* | *It is used in meals.* | |

### Evaluate the activity

The mentor evaluates the activity by asking the following questions to the participants. After this verbal evaluation, the mentor writes a short report about the activity.

- What did you feel?

- Did you like the activity?

- What did you realize?

- Were you able to attain the knowledge that you were looking for?

# COURSE-3: INTERPRETATION AND DEFINITION

### Purpose

To define more clearly adult students' needs and problems regarding ICT.

### Material

Post-it and A3 size paper (how might we toolkit)

### For Whom

Mentors and Adult Learners

---

### Warm-up Game

**1**

It is useful to bring the participants together to ensure that they can hear the instructions and establish physical contact. We give them a scarf to cover their eyes. At this moment, they should stand at the same level. The leader gives the necessary information via announcing and whispering to each of the participants. We write a part of the information on a small piece of paper and give it to the participants before they cover their eyes. The instruction may be to form a line from tall to the short, or the leader may whisper them to form a line from tall to the short. Another duty may be telling them to from a line according to their shoe numbers.

### Briefing about adults' problems with ICT

**2**

The mentor will present the problems the target group has with ICT according to their teaching experience. The mentor listens carefully to the answers and writes down the most important points. This information should be used in the preparation of the ICT challenges and in planning ICT learning activities.

### Exercises

*Annex-3*

**3**

During this process, storytelling method is used. Each participant will tell her/his major problems with improving her/his ICT ability. Meanwhile, mentors and trainers will listen to their stories with utmost care, and they will prepare a report. They will write the keywords about the problems on post-it and will hang them on the wall. Each participant will read these words and mark these post-its if (s)he has the same problem. This will be an activity to find out common problems.

Finally, trainers and mentors will tell the success stories of those people who have learnt about ICT in adulthood.

• Develop "how might we" questions

For example:

How might we adapt to ICT technologies?

How might we decide to what we learn concerning ICT? How might we create time and space for ICT?

How might we improve the relationship between ICT and our experiences?

### Evaluate the activity

The mentor evaluates the activity by asking the following questions to the participants. After this verbal evaluation, the mentor writes a short report about the activity.

- What did you feel?

- Did you like the activity?

- What did you realize?

- Were you able to attain the knowledge that you were looking for?

## COURSE-4: IDEATE

### Purpose

Ideate about the problems defined. Discuss the ideas proposed and evaluate them without prejudice. There may not be a concrete solution to every problem, more than one idea may be proposed.

### Material

SCAMPER QUESTIONS

### For Whom

Adult Learners

### Warm-up Game

Participants say their names and make a gesture that reflects their current mood (e.g. clapping, hugging and laughing)..

### Talk about the importance of ideation in solving problems

Ideation explores and identifies potential solutions. İdeation is a creative process that allows generating new ideas through a variety of ideation techniques such as brainstorming and prototyping. If done correctly, ideation helps adult learners and mentors determine the right problems and find the right solutions for them.

### Exercises

*Annex-4*

Before starting the activity, encourage all participants to share all kinds of opinions. During the activity, SCAMPER technique is used. SCAMPER is a funny kind of "brainstorming" which is done step by step and using techniques determined in advance. It is comprised of seven steps. The name of the method comes from the combination of the capital letters of the names given to each step. The chosen object is changed, developed, divided into parts, and combined with other objects through SCAMPER. The students are asked directing questions students to ensure different and authentic ideas.

**S:** Substitute

**C:** Combine

**A:** Adapt

**P:** Put to other uses

**E:** Eliminate

**R:** Reverse, Rearrange

### Evaluate the activity

The mentor evaluates the activity by asking the following questions to the participants. After this verbal evaluation, the mentor writes a short report about the activity.

- What did you feel?

- Did you like the activity?

- What did you realize?

- Were you able to attain some new and useful knowledge?

## COURSE-5: PROTOTYPE

### Purpose

Create solutions based on ideas proposed. Prototypes helps you with presenting your ideas to the user. This stage is experimental. It helps you with testing the solutions found in the previous stage.
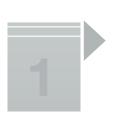
### Material

Paper, pencil, glue, colored paint, scissors.

### For Whom

Adult Learners

### Warm-up Game

All the participants raise index finger, middle finger and ring finger up. Index finger represents "name", middle finger represents "favorite drink" and ring finger represents "their favorite social media". While walking around the room, the participants touch the fingers of the people they meet with theirs and explain what the fingers represent in turn.

### Tell the significance of prototypes and what good it would do

Fourth step of Design Thinking method is an experimental stage. The aim of this step is to find out the best solution for each of the problems identified in the first three steps in the shortest time possible. You prototype a simplified version of your chosen idea in order to be able to test the problem solutions with users that emerged during the idea generation step.

**Exercises**

Design the solutions you have found with your materials. For example, design a classroom for a better ICT training. Place the necessary materials, subjects, and people in the classroom.

For example, a subject is explained to everyone in the same way in ICT education. While the adults only need to learn sending an e-mail and using google drive, trainings may include complex topics such as excel or software. The solution here is to design the class according to different needs of an ICT class. The prototype of this can be made like this; A classroom design is made from paper or play dough. The inside of the classroom is organized according to different educational topics. For example, the computer of the person who needs to learn Photoshop is different, or the computer of the person who will learn the office program is different. A class with different ICT tools is designed and prototyped.

**Evaluate the activity**

The mentor evaluates the activity by asking the following questions to the participants. After this verbal evaluation, the mentor writes a short report about the activity.

- What did you feel?

- Did you like the activity?

- What did you realize?

- Were you able to attain some new and useful knowledge?

## COURSE-6: TEST

**Purpose**

You could test the prototypes you have created through sharing them with users. Sometimes, it may require going back to the previous step based on the evaluation of user feedbacks. Tests made by users will show you whether you determine the problem and its solution in a correct way or not.

**Material**

**For Whom**

Mentors and Adult Learners

**Warm-up Game**

Each participant tells why he came here? A group forms from those who came for the same purpose. The groups formed talk about the emerging goals.

**Tell the importance of testing and what good it would do**

It is difficult to test every solution in real life. For example, it is expensive to design a classroom. Therefore, it is important to test the prototype in an imaginary way. If possible, the prototype is made quite realistically. However, considering that, it is very difficult to find enough time and materials to make realistic prototypes in this workshop, we should test the simplest prototype

**Exercises**

Tell other participants your prototypes and encourage them to test and comment on your design.

For example, a classroom design with different ICT tools was made in the prototype section. In this section, participants examine and test this classroom design (they imagine). They behave as if they were using the classroom and test whether the class can produce a solution to its own problem.

**Evaluate the activity**

The mentor evaluates the activity by asking the following questions to the participants. After this verbal evaluation, the mentor writes a short report about the activity.

- What did you feel?
- Did you like the activity?
- What did you realize?
- Were you able to attain some new and useful knowledge?

**ANNEXES**

Annex-1: Empathy Map (for Activity-1)

**WHAT ARE HER/HIS THOUGHTS AND EMOTIONS?**

When did she/he become unsuccessful when she/he was using ICT media?

What makes her/him afraid when using ICT media?

What does she/he imagine learning about ICT?

What can motivate her/him about developing herself/himself in this field?

**WITH WHOM WE TRY TO EMPATHIZE?**

With whom we try to empathize?

What is the significance of ICT for her/him? What are his experiences about ICT?

Which emotional and economic factors motivates her/him?

**WHAT ARE HER/HIS REQUIREMENTS THAT ARE MET OR NOT MET?**

Which information about ICT should she/he learn? How does she/he understand that she/he is successful?

Why has not she/he met her/his requirements until that time?

What kind of a learning environment is necessary?

What may her/his requirements that she/he could not identify be?

Why meeting these requirements is significant for her/him?

**WHAT DOES SHE/HE SEE?**

What does she/he see when she/he comes across with ICT media?

**WHAT DOES OR CAN SHE/HE DO?**

What does she/he do in her/his spare time?

What are her/his habits?
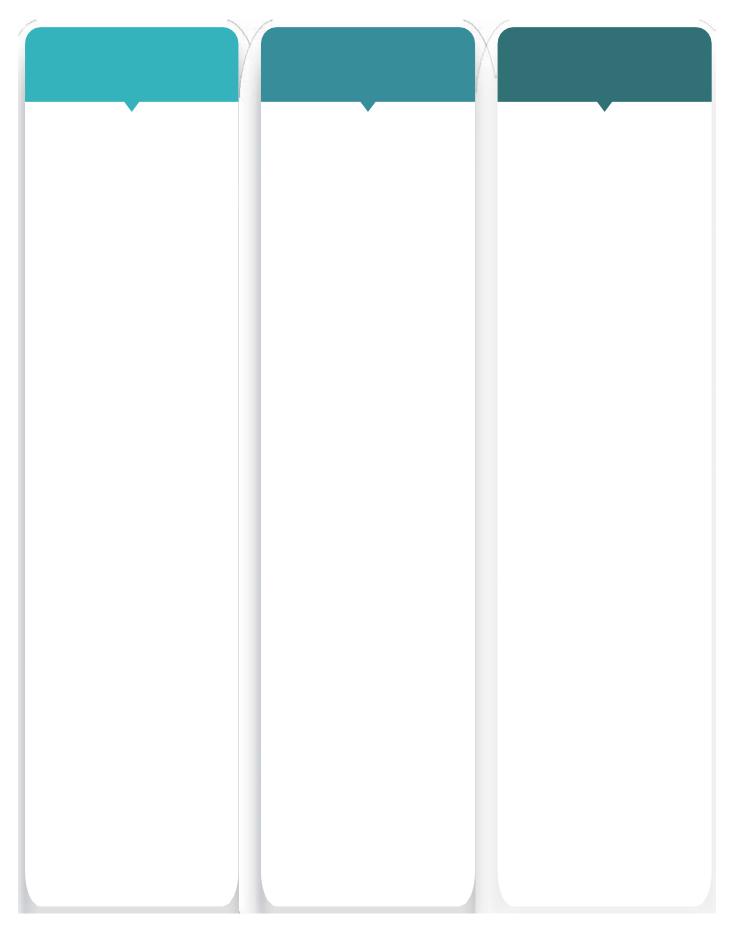
What are her/his abilities about ICT? (web design,social media management, ofce programs, learning via training videos etc)

Does she/he try to learn something new via Internet?

**WHAT DOES SHE/HE SAY?**

What else does she/he say about ICT media?

# ANNEXES

## Annex-2: Creative Thinking Activity (for Activity-2)

## ANNEXES

## Annex-3: How might we toolkit (for Activity-3)

# ANNEXES

## Annex -4 Scamper questions (for Activity-4)

| | |
|---|---|
| Which material or materials might be used to design ICT training for adults? **Substitute** | What might we combine with your ICT training and what kind of a functional difference does it create? **Combine** |
| What change in your ICT training might produce different products? **Adapt** | How might your ICT training work if it takes longer or shorter time? **Modify, Minify, Magnify** |
| In what other ways might your ICT training be used to solve a problem? **Put to other uses** | Are there any parts or subjects that could be eliminated in your ICT training? **Eliminate** |
| If you designed ICT training process, what kind of changes would you make? **Reverse, Rearrange** | **Core Ideas** |