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LUOVA

**USING ONLINE ESCAPE ROOMS TO
BUILD CREATIVE THINKING SKILLS**

In Service training

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Introduction and aims

In this training program you will learn about the creative and critical thinking as well as:

- What is the difference between creative and critical thinking;
- Which techniques and tools to use for both;
- What is challenge based learning;
- How to evaluate (web) sources;

Each topic is discussed divided into in a separate unit paragraph , which covers all the necessary theory about it. The aim of it is to give you a profound base to build on and discovered different views on the subject.

Apart from the main part of the theory, there is a reflection and a summary of the module to revise the information represented.

Then, if you wish, you will find practical exercises to consolidate the information and test your knowledge.



Key Learning content

Creative thinking

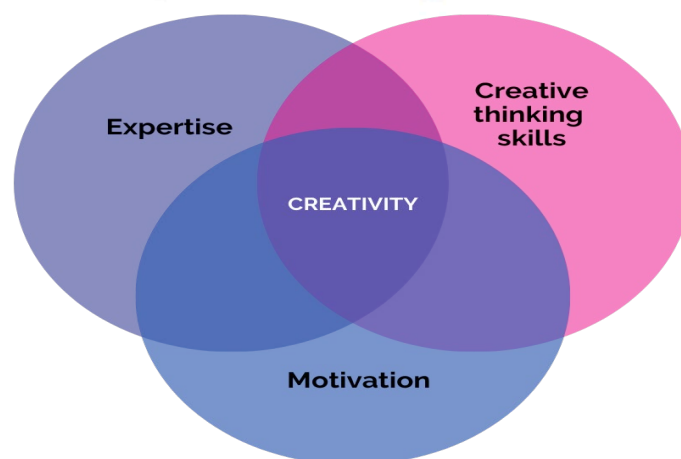
What is creativity? By Cambridge dictionary creativity is the ability to produce or use original and unusual ideas. **Creativity** is defined as the **creation of something new**.

However, creative thinking is a **cognitive process** or the realisation of ideas that changes our relationship with the world. Often in most cases, however, creative thoughts or **ideas are not something completely new**, but rather finding **new connections between existing concepts**. It makes many of us think creatively. Not all of us may come up with the next great invention, but if we are given the most basic freedom, we can analyse the activities we perform on a daily basis and find ways to do them better.

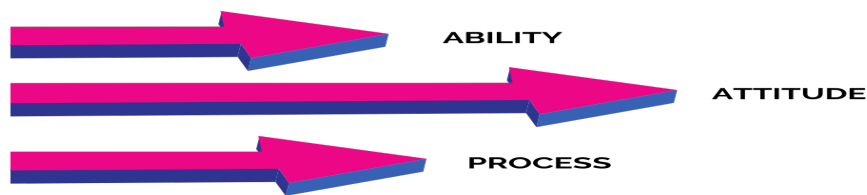
It is essential for creative thinking to **create an environment that provides an opportunity for spontaneity and rewards it**. In addition, the processes that enable evaluation, innovation and the putting of creative thinking into practice are important in fostering a sustainable creative environment. This **environment encourages effective ideas**.

Teresa Amabile is an expert in the field of creativity and innovation. She believes that within every individual, creativity is a function of three components: expertise, creative-thinking skills, and motivation.

- **Expertise Component** - knowledge, expertise, and access to relevant information
- **Creative Thinking Skills Component** - capacity to think outside the box and put existing ideas together in a new combination



- **Motivational Component** - need or passion to be creative.



There is another **way to look at creativity** (Harris, 1998):

- **Ability**

A simple definition is the ability of creativity to imagine or invent something new. As we will see below, creativity is not only the ability to create something (only God can do it) completely new, but the ability to generate new ideas by combining, modifying or reapplying existing ideas. Some creative ideas are surprising and ingenious, while others are simple, good and practical ideas that no one has thought of yet.

Believe it or not, everyone has important creative abilities. See how creative children are. In adults, creativity is very often suppressed by education, but it still exists and can be revived. Usually creativity takes only commitment and time.

- **Attitude**

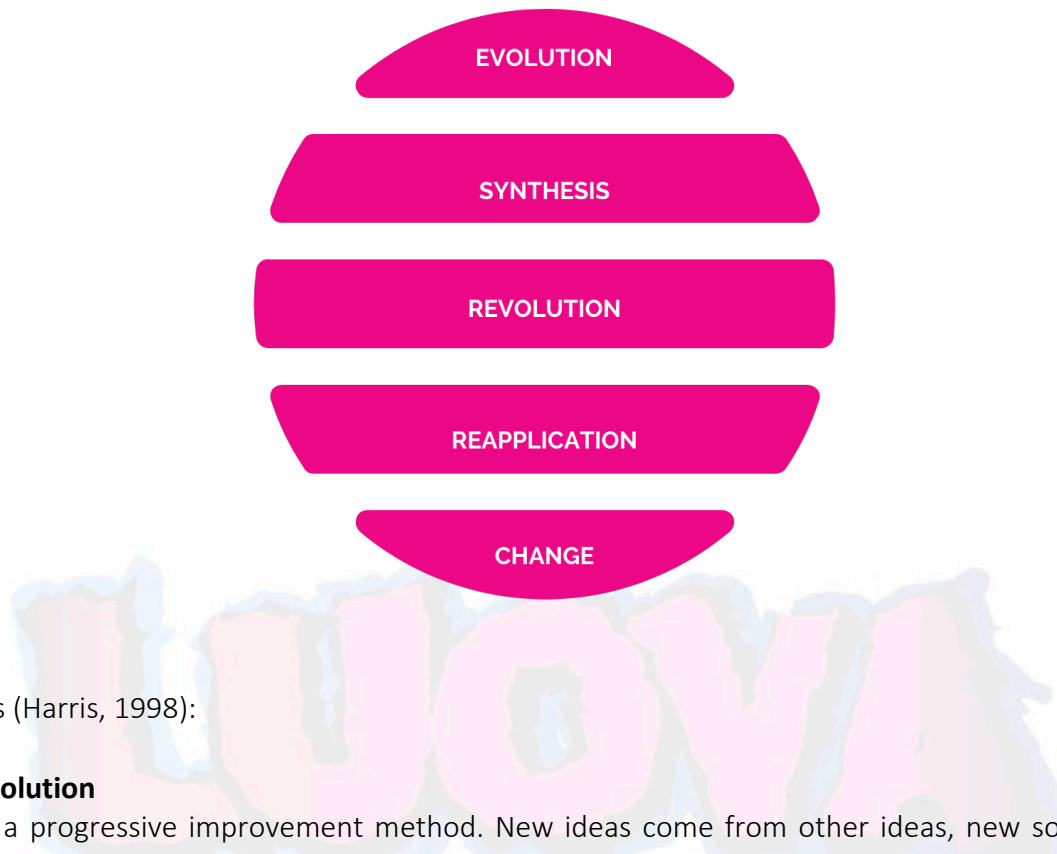
Creativity is also an attitude: the ability to accept change and innovation, the desire to play with ideas and possibilities, the flexibility of perspective, the habit of using kindness, when looking for ways to improve it. For example, we socialise to accept only a small number of permitted or normal things, such as chocolate-covered strawberries. The creative person notices that there are other possibilities, such as peanut butter and banana sandwiches or chocolate-coated prunes.

- **Process**

Creative people work resiliently to improve ideas and solutions, gradually making changes and finalising their work. Contrary to the mythology surrounding creativity, very few creative works of excellence are produced in a flash or in rapid madness. The stories of companies that had to take away an invention from the creator to market it are much closer to the truth, as they would have constantly improved and changed, always trying to make it a little better.

CREATIVE METHODS

Several methods have been identified for producing creative results. Here are the five classic



ones (Harris, 1998):

- **Evolution**

It is a progressive improvement method. New ideas come from other ideas, new solutions from previous ones, which are slightly better than old ones. Many of the very complex things we enjoy today have evolved during a period of constant growth. By doing something a little better here, a little better there, it will gradually become something much better - even completely different from the original.

The evolutionary method of creativity also reminds us of this critical principle: each problem solved can be solved even better. Creative thinkers disagree with the idea that once a problem is resolved, it can be forgotten, or with the understanding that "if it is not broken, do not fix it." The philosophy of the creative thinker is that "there is nothing like insignificant improvement".

- **Synthesis**

This method combines two or more existing ideas into a third new idea. The combination of magazine ideas and audio tapes gives you a magazine idea you can listen to - useful for people who are blind or commuting.

- **Revolution**

Sometimes the best new idea is a completely different and noticeable change from the previous ones. Although the philosophy of evolutionary improvement may ask the teacher, "How can I improve my lessons?" the revolutionary idea could be: "Why not stop giving lectures and ask students to help each other, to work in a team or to report?"

- **Reapplication**

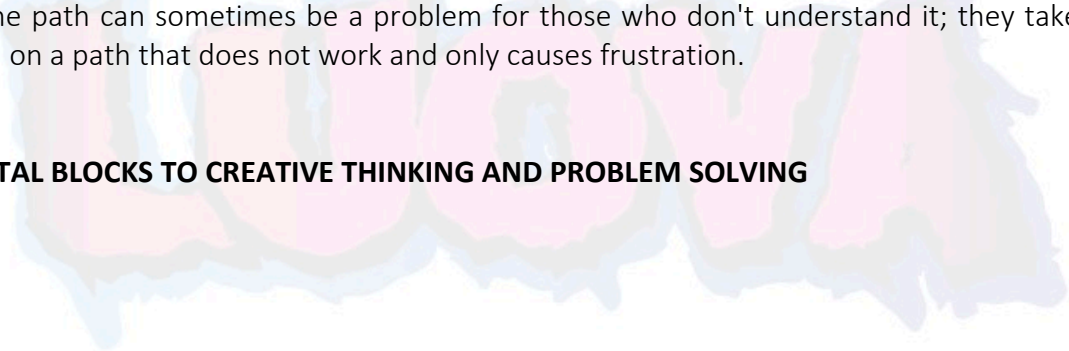
Look at something old new. Go beyond the labels. Eliminate prejudices, expectations and assumptions and find out how to reapply something. A creative person can go to the trash and see the art in an old transmission machine. He paints it and puts it in the living room. Another creative person might see in the same transmission the necessary gears for a multi-speed hot walker for his horse. He hooks it to some poles and a motor and puts it in his corral. The key is to see beyond an earlier or advertised app for an idea, solution, or thing, and see what other app is possible.

- **Changing Direction**

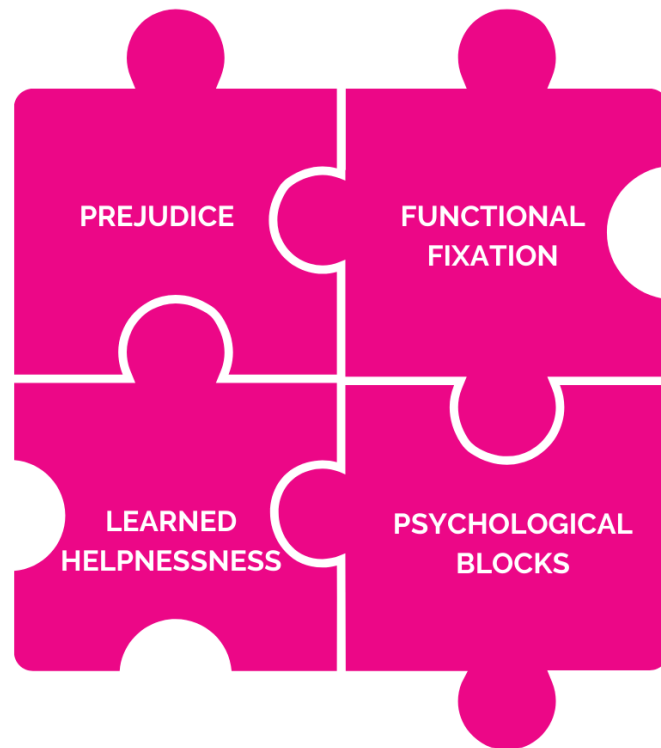
Many eye-catching breakthroughs occur when the focus is moved from one problem angle to another. This is sometimes called a creative insight.

The goal is to solve the problem, not to implement a specific solution. If one solution does not work, go to another. It is not a commitment in a certain way, but a certain objective. Fixing the path can sometimes be a problem for those who don't understand it; they take too much on a path that does not work and only causes frustration.

MENTAL BLOCKS TO CREATIVE THINKING AND PROBLEM SOLVING



What are the mental blocks we create ourselves which prevent us from making the



most of our creativity and thus solving problems Harris, 1998):

- **Prejudice**

The older we get, the more ideas there are about things. These biases often prevent us from seeing beyond what we already know or believe is possible. They will not allow us to accept change and progress.

- **Functional fixation**

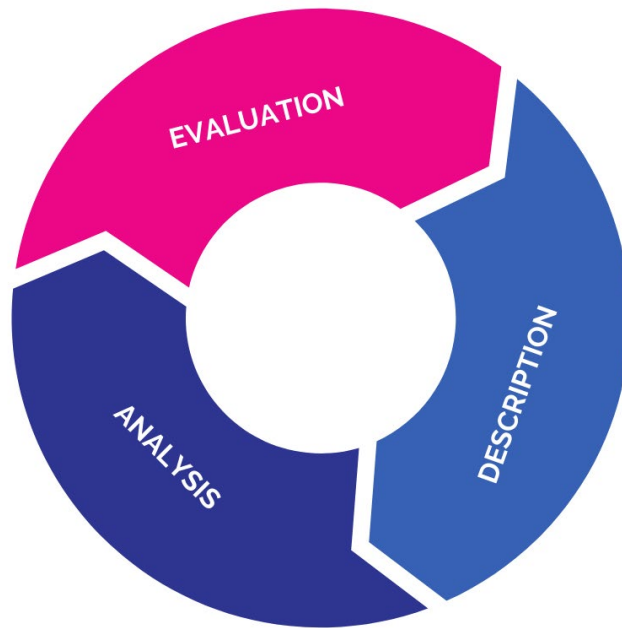
Sometimes we only see an object by name, not by what it can do. We therefore only consider the mop as a floor cleaning device and do not think that it could be useful for cleaning the cobweb from the ceiling, washing the car, doing aerobic exercises, opening or closing the door, etc.

- **Learned helplessness**

It's like you don't have the tools, the knowledge, the equipment, and the ability to do something, so you cannot give it a try. We are trained to hope that almost everyone will rely on other people. We think small and we limit ourselves. But you can communicate with the world. If you need information, there are libraries, bookstores, friends, teachers and of course the Internet.

- **Psychological blocks**

Some solutions are not considered or rejected simply because our reaction to them is negative. Psychological blockages prevent you from doing something just because it doesn't sound good or right, which is ridiculous. Overcoming these blockages can be very useful.



Critical thinking

What is critical thinking? By Cambridge Dictionary it is the **process of thinking carefully about a subject or idea, without allowing feelings or opinions to affect you.**

David Hitchcock states that critical thinking is a **widely accepted educational goal**. Adopting it for educational purposes is recommended to respect student autonomy and prepare them for success in life.

Critical thinking is becoming more and more important in the contemporary world, as we are all faced with different kind of **information from various information sources**, which might not all be equally reliable. Critical thinking helps us to **understand and analyse information more thoroughly.**

This three-stage model will help generate questions to **understand, analyse, and evaluate** something (Library, n.d.).

Description

Starting with the description stage, you ask questions such as: What? Where? Why? and Who? These help you establish the background and context.

Example

- Who wrote this?	- What is the problem about?
- What is it about?	- Who does it involve or affect?
- When was it written?	- When and where is it happening?
- What is the aim of the article?	

These types of questions lead to descriptive answers. While the ability to describe something is important for actually developing our understanding and communicating critically, we need to go beyond these types of problems. This will take you to the analysis phase.

Analysis

Here you will ask questions such as: How? Why? and What if? These help you to examine methods and processes, reasons and causes, and the alternative options.

Example

- How was research conducted?	- What are contributing factors to the problem?
- Why are these theories discussed?	- Might one factor impact another?
- What are alternative methods and theories?	- What if one factor is removed or altered?

Asking these questions will help you divide something into parts and consider the relationship between the parts and each part as a whole. This process will help you develop more analytical responses and deeper thinking.

Evaluation

Finally, you come to the evaluation stage, where you will ask 'so what?' and 'what next?' questions to make judgments and consider the relevance; implications; significance and value of something.

Example

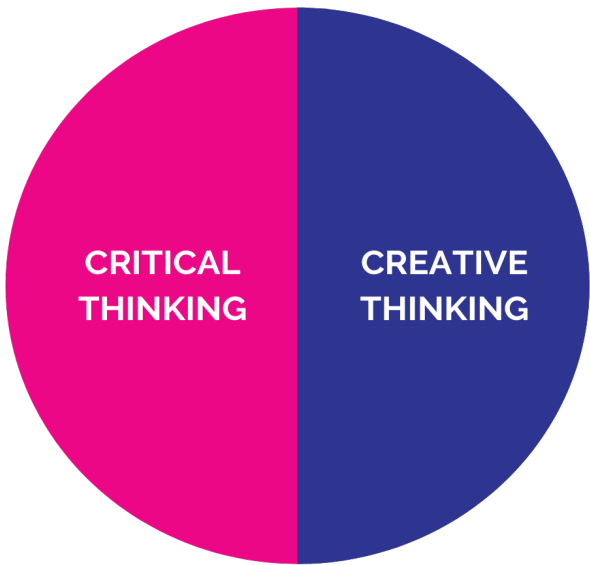
- What do I think about this?	
- How is the relevant to me?	
- How does this compare to the other research I have read?	

Making such judgments will lead you to reasonable conclusions, solutions, or recommendations.

Critical vs creative thinking

Much of the way of thinking in formal education emphasises **analytical skills** - it teaches students to understand statements, to follow or create a logical argument, to find the answer, to

eliminate bad ways and focus on the right one. However, there is another type of thinking - **creative** - that focuses on exploring ideas, generating opportunities, instead of looking for the



right answers for many.

These two ways of thinking are crucial for a successful professional life, but the latter tends to be overlooked until graduation. We can distinguish these two types of thinking (Harris, 1998):

analytic	generative
convergent	divergent
vertical	lateral
probability	possibility
judgement	suspended judgment
focused	diffuse
objective	subjective
the answer	an answer
left brain	right brain
verbal	visual
reasoning	novelty
yes but	yes and
solution path	solution paths

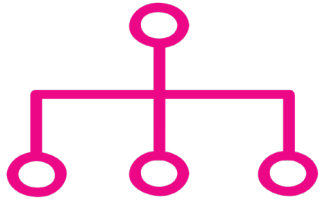
In activities such as **problem solving**, both ways of thinking are important to us. First, we need to **analyse the problem**; then we have to **create possible solutions**; then we have to **choose** and **implement the best solution**; and finally, we need to **assess the effectiveness of the solution**.

As you can see, this process alternates between two types of thinking - **critical and creative**. In practice, the two modes of thinking work together most of the time and are not really independent of each other.



Creative and critical thinking techniques and tools

It can be difficult for creatives to come up with new ideas every day. Fortunately, there are several **techniques you can apply to replicate your creativity**. Below are several creative problem-solving techniques that can be used (Gardiner, 2013).

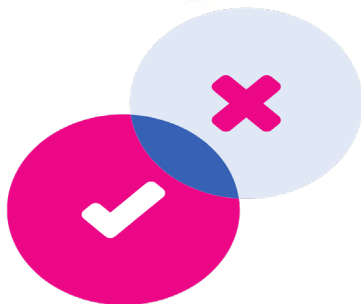
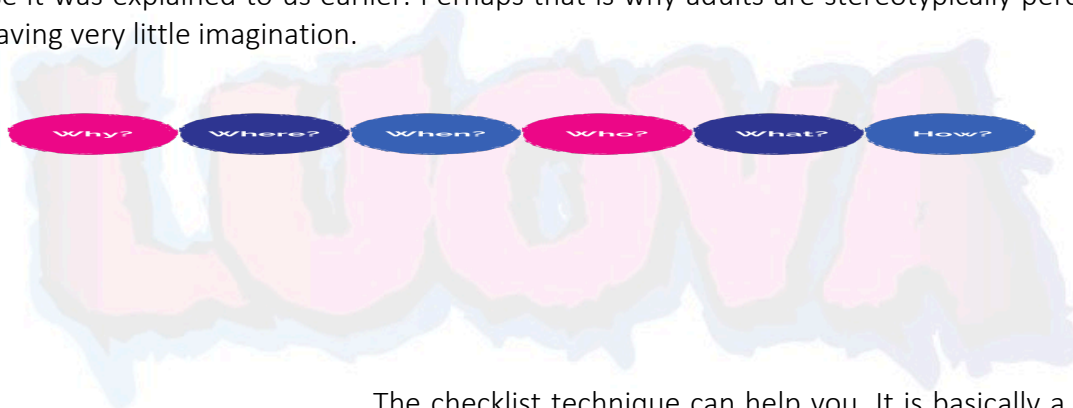


Mind mapping

The key to mind mapping (or brainstorming or spider diagrams) is to consider each idea that emerges. Do not neglect anything, as far-fetched as it may seem. Save the critical selection process for later. Generate as many ideas as possible; the more you come up with, the more likely you are to find this golden idea.

The checklist

If you have ever played a "Why?" game with a child, then you know exactly what I am talking about. As we get older, we tend to stop asking so many questions. We accept a lot more because it was explained to us earlier. Perhaps that is why adults are stereotypically perceived as having very little imagination.

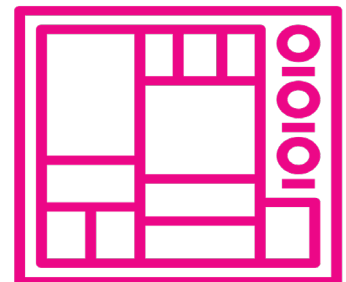


The checklist technique can help you. It is basically a list of questions that you need to ask yourself before you start working. Six universal questions that can be asked:

Random word generator

Just choose two random words and try to connect your idea in the most imaginative way possible. The real fun part is how you decide to find words. You can

use a web generator; or you can browse the dictionary.



Mood board

A mood board - like a collage - is a collection of images, fonts,

icon colors, etc. that represent a specific theme or style. Mood boards are also known as inspiration boards and are commonly used in design projects.

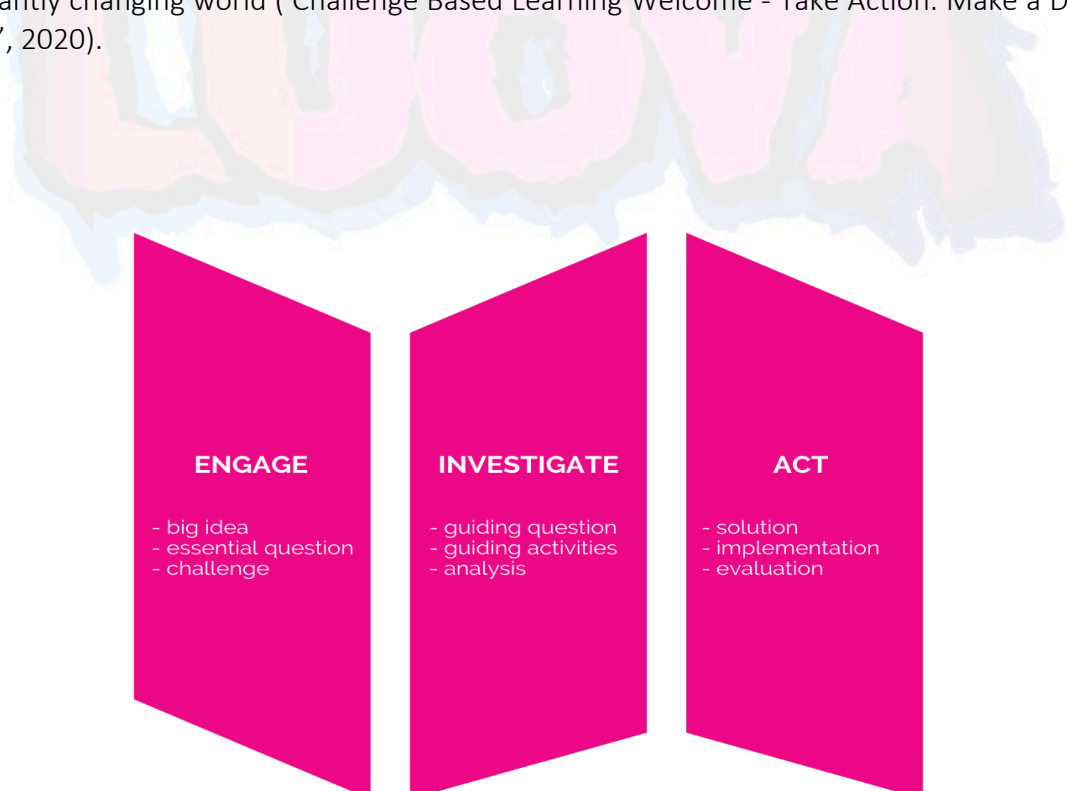


SWOT analysis

SWOT stands for strengths, weaknesses, opportunities and threats. In business planning, SWOT analysis is applied in different situations; in competitor analysis, situation analysis, strategic planning, personal evaluation, etc. It can be used to identify effective innovative opportunities, mitigate threats using strengths, etc.

Challenge-based learning

Challenge-based learning (CBL) provides **an effective and efficient learning framework** while meeting **real-world challenges**. The framework encourages collaboration to identify **big ideas**, ask **thoughtful questions** and identify, explore and solve **challenges**. CBL helps learners acquire **in-depth knowledge of the subjects** and **develop the skills** necessary to succeed in a constantly changing world ('Challenge Based Learning Welcome - Take Action. Make a Difference.', 2020).



This framework is divided into three phases: **Engage**, **Investigate**, and **Act**; with each step containing activities that prepare for the next (Barney, 2019):

Step 1 - ENGAGE

This learning environment begins with a **great idea**, a broad concept that can be explored in many ways.

It is then clarified by an **important question**. This should be a question that can identify the important aspects of a good idea, creating a better scope for the whole learning process.

Based on research to answer an important question, a **challenge** is proposed to find answers



Guiding questions will be created for the next part of the process, indicating what needs to be learned to turn the challenge into a real solution.

These questions emerge throughout the experience and are answered through **guiding activities and resources**, which can be any method or tool available.

Further **analysis** of the lessons learned from the guides will provide a basis for the final definition of the solutions.



Example:

For example, if the Challenge is “Be healthy”, Guiding Questions might include:

What does it mean to be healthy? What is the biology of health? What factors influence health? What are the major health issues in the world, my community, and my family? What is the role of nutrition? What is the role of exercise? What is the role of genetics? At this stage the more questions, the better.

Resources and activities might include interviews with physicians, research using online databases and participation in an online course about nutrition.

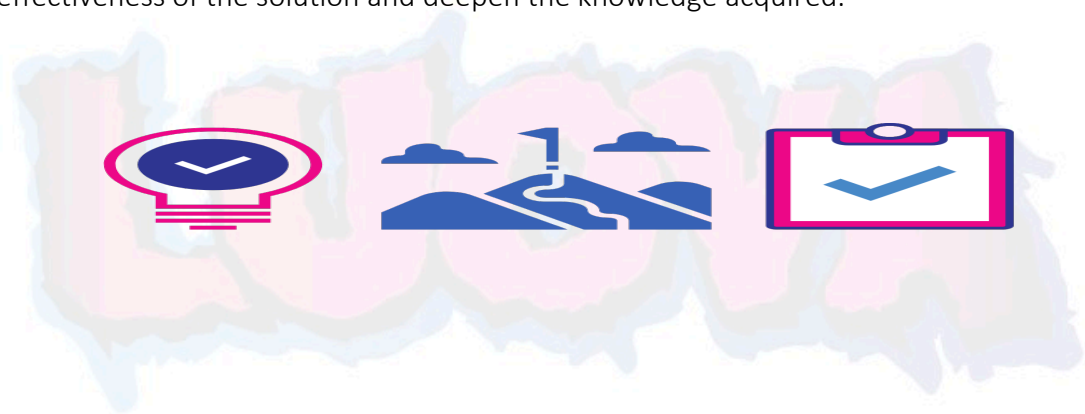
An example conclusion from the Health Challenge might be that the most important aspects of being healthy include nutrition and diet are dependent on access to certain types of food.

STEP 3 - ACT

The final step in the framework is the generation of a **solution concept**, which results from the completing the research phase. Using the design cycle, prototypes and tests are carried out to refine and shape the concept.

The solutions can then be **implemented** in a real environment with an authentic audience, depending on the time and resources available.

The process ends with an **assessment**, which provides an opportunity to make changes, see the effectiveness of the solution and deepen the knowledge acquired.



Evaluating sources

Evaluating sources of information is an **important part of the research process**. Not all information is **reliable** or **true**, and not all information is **suitable** for your article or project. Print and Internet sources vary widely in terms of **authority, accuracy, objectivity, currency** and **coverage**. Users should be able to critically assess the suitability of each type of information source before relying on it.

Evaluate the information ('Research Guides: Module 6: Evaluating Sources: Why Is It Important To Evaluate Sources?', n.d.):

- To find the most **relevant** information for your subject and task
- To ensure the **quality** and **reliability** of research
- To find **expert** opinions, views and research on your topic



- To remove **unreliable, biased, outdated**, and / or **incorrect** information
- AAOCC** (Authority, Accuracy, Objectivity, Currency, and Coverage)
(‘Evaluating Information Resources’, n.d.)

Authority

Who is the author or creator and what are their credentials? Are there references to author’s education, other publications, professional affiliation or experience?

Make sure to distinguish between the author of the information and, if it is separate, the person who published it.

In the case of online documents from committees, organisations, businesses or government agencies (not individuals), similar questions should be asked regarding the mandate of these bodies. Be sure to determine whether the information provided by social organs is likely to be objective, factual and carefully studied, or whether it is biased according to the specific objectives of these organs or the causes, movements or programs they support.





Accuracy

Accuracy is obviously paramount when researching any subject that deals with real things and events. Data and information should be based on observations, measurements, analyses, interpretations and conclusions. In the arts and humanities, where imagination is the main creative force, precision is always important in recording the names, dates and places where creative work, ideas and opinions come from.

In all cases, all information must be verifiable.

- Are the conclusions based on actual studies or data that can be verified from other sources?
- Are scientific research methods explained in a reproducible way?
- Are the sources of information listed in the concluding / closing notes, bibliographies or reference lists?
- How reliable are the sources cited?

High-quality writing, including correct formatting, grammar, spelling and punctuation, can improve the appearance of accuracy and build readers' confidence in the accuracy and reliability of an online document. However, creating a professional looking website is easy. This is a good start, but not enough evidence to conclude that the information provided is accurate. Also use other criteria.

Objectivity

Authors often have their own agenda, such as selling products, or influencing legislation. There is probably no absolute objectivity on which everyone can agree. When using an information source, you must decide whether the information is objective enough for your purpose or whether it is biased. Of course, a very biased presentation can also be included in the research if this prejudice is described and compared to other points of view or interpretations.



- Is the source related to advertising or fund-raising? This financial support may distort the scope of the publication.
- Does the author offer more than one perspective?
- Does writing use inflammatory or biased language?

Currency



Ask yourself whether or not the timeliness of the information affects its usefulness. The date of the material should be indicated to some extent, as in the "last updated" statement at the end of many web documents. Please note that the website's last update date may differ from the content date. This can mean checking three dates, the date the page was last updated or published on the web, the date of publication, and the date of surveys or statistics used.

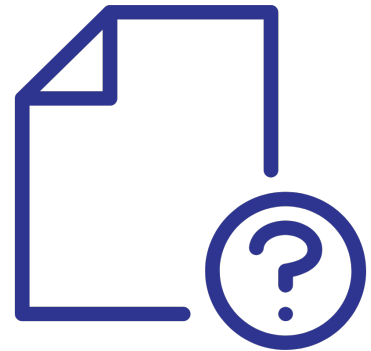
Coverage

Decide if the information source covers the topic adequately. The documents may cover only part of the topic and you will need more resources to understand them better.

Consider how to compare the coverage of one source with the coverage of other sources.

Look for a statement describing the purpose or coverage of the source and determine if the information is complete enough to meet your needs.

Does the source of information leave questions unanswered (ask the five W's and a H to check: who, what, when, where, why and how)?



Reflection and transfer

This module was developed as a way to understand more thoroughly about creative and critical thinking and how they can be used in real life to improve your problem solving skills and be able to evaluate sources accordingly.

Most people involved in learning and development are aware that reflection and feedback are essential components of adult learning. To ensure you have attained the knowledge shared in the previous sections, please take time to reflect. For that take a paper and draw a table such as the one below. If you are unable to use paper and pen, use your computer or a phone.

Assessment

Assessment 1

Statements

The purpose of this activity is to encourage participants to use their critical thinking skills. Thinking critically means employing analytical skills, viewing things with a broader perspective, and considering all possible options. Critical thinkers know NOT to take things at face value. They realise that there is a difference between appearance and reality and can easily detect these differences.

FACTUAL STATEMENTS	There are many kinds of computers. Coffee is one of the major exports of Puerto Rico. Library records show that more non-fiction books have been borrowed this year than last year. A bad case of measles could cause blindness. My mother gets mad if I wear dirty socks for a week. Students who cut class usually get called to the office. Football is a popular sport in the Americas. My mother told me that my bedroom is a mess. Maria is a Mexican American. I spent \$100 today."
STATEMENTS OF PERSONAL TASTE	I prefer to use an apple computer. I like chocolate candy but I hate chocolate cake. My favorite author is John Smith. Don't sneeze on me - hate to catch a cold. I'd like to go barefoot all summer. I would like to cut math class. I enjoy playing dominos. I like rap music. I like Italian food. As far as I'm concerned, \$4.00 an hour is a low wage.
VALUE JUDGEMENTS	Computers should be built to last. People with bad taste should get fashion advice. You shouldn't believe everything you read. All children ought to be vaccinated against serious diseases. Beto is the best swimming teacher at the pool. It's important to attend church regularly. It's better to be involved in a game than sit watching. Students should develop good work habits. It's wrong to accuse a person without very good reasons. It's wrong to spend more money than you earn.

Script

Setting: The Girard dining room at dinner time.

Characters: Elena Martinez, age 18, and Martin, her 12 year-old brother.

ELENA: Eat your dinner. You're wasting food. Think of all the starving children in other countries.

MARTIN: But I'm not starving and I'm not wasting food. Listen, I could be well fed and healthy with only half the food I get.

ELENA: Prove it. Go on – show me statistics for growing kids.

MARTIN: O.K., but I read about it in a magazine at school. We don't have any books about nutrition around the house.

ELENA: So eat your dinner. Mom knows best.

MARTIN: Not on this she doesn't. You said I was wasting food. I say Mom is wasting it by giving me more than I need. I don't need this much to eat – especially not in the summer when I'm lying around and not using much energy.

ELENA: If you can't prove what you're saying, stop talking and start eating.

Points for Discussion

What kind of arguments are Elena and Martin having?

ANSWER: Argument over facts – how much food kids need to stay healthy.

Even though they are arguing about facts, each of them had stated an opinion. What are the opinions?

ANSWER: Elena says Martin is wasting good food, and that his mother knows best. Martin says he's not wasting food; it's his mother who is wasting food.

What if Martin located facts to show that growing children need less food than he is asked to eat? Would these facts prove that Martin's opinion is correct? Why can't opinions ever be proved true or false?

Elena and Martin could not settle their factual argument because the facts were in books and magazines that were at school. Can you think of other kinds of factual arguments that would be hard to settle?

ANSWER: When different books or other sources state contradictory facts, or when a fact has not yet been established and must be tested, For example: —I can swim faster than you can.

Assessment 2

Brainstorming

Choose one of the following problems for a brainstorming session. Generate at least 35 ideas for solving the problem. Then distill this list into at least three practical, effective ideas.

1. A new snack food
2. How to keep rowdy children quiet on a school bus
3. How to get more tourists into the United States
4. How compatible people can meet each other for romance
5. How to reduce hospital costs
6. How to reduce airport congestion and delays
7. A name for a new laundry detergent
8. How to keep your car keys safe at the beach
9. A new toy
10. A new electronic consumer product

Assessment 3

What-If

A major block to creativity for many of us is the mind's fierce grasp on reality. This very factor that keeps us sane also keeps us from thinking beyond what we know to be true. What-iffing is a tool for releasing the mind, for delivering us from being blocked by reality.

In its simplest form, what-iffing involves describing an imagined action or solution and then examining the probable associated facts, consequences, or events. Instead of quickly saying, "That sounds dumb," or "That would never work," and leaving our criticism vague, we trace as exactly as our reasonable minds can generate the specific implications or consequences of the newly imagined fact.

As I said, too often we simply stop thinking altogether when something contrary to fact comes across our minds or else we think about it in the most illogical and impractical way. When we ask, "What if the sky were green?" the response we tend to get, either from others or from ourselves, is, "Well, the sky isn't green, so why think about it?" But if nothing else, thinking about it is good practice at logical thinking.

In more practical terms, though, thinking about what does not exist is about the only way we have of eventually making it exist. In other words, the first step to implementing a new reality is to imagine it.

Notice when you mention a "what if" to your friends, their reaction will probably be to laugh and change the subject, or to laugh and suggest one funny consequence. There is little attempt to trace probable consequences thoroughly, to outline a full set of associated realities. By not doing so, we are in danger of cutting off many new ideas.

Choose one of the questions below and then trace the reasonable and logical consequences that would follow. You might be sure to think of both good and bad (and perhaps indifferent) consequences. List or describe (in a sentence or two each) at least ten consequences.

What if anyone could set up as a doctor?

What if each home could run the television only one hour a day?

What if a citizen could serve only one term in one office during a lifetime?

What if gasoline grew on trees and was a renewable resource?

What if exams and grades were abolished in college?

What if our pets could talk?

What if we never had to sleep?

What if we could read other people's minds (and they could read ours)?

What if all marriages were automatically cancelled by the state every three years?

What if everybody looked almost exactly alike?

What if clocks and watches didn't exist and daylight lasted six months?



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BUILD CREATIVE THINKING SKILLS**

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Introduction and Aims

Education in formal and non-formal settings can be benefitted by the technological innovations which have brought significant opportunities to the sector. In particular, the utilisation of online software and tools for the design of digital learning material has the potential to reach younger generations by taking advantage of their immersion in technology.

One of the most popular activities of young people in the digital age is digital gaming which characteristics have been adopted in areas beyond entertainment. An emerging strategy that is gaining ground in this area is gamification. From an educational perspective, gamification can be effective when it is used to encourage learners to progress through content, motivate action, influence behaviour, and drive innovation.

This Module aims to support front-line youth workers to harness the potential of game-based learning environments to build high-value skill sets within their marginalised target groups. In detail, the Module will provide insights on the teaching and learning processes which can be supported by the digital escape room methodology. Additionally, at the end of the Module, youth workers can find a rich pool of resources for the application of the digital escape room methodology to formal and non-formal educational settings.

In particular, upon the completion of the Module adult educators will be able to:

- Describe the benefits of gamification in education;
- List the game mechanics and describe their use;
- Identify the characteristics of game-based learning;
- Apply learning theories to the development of digital escape rooms;
- Apply the principles of gamification to the development of digital escape rooms;
- Utilise the digital escape room methodology to support non-formal and informal training opportunities for youth.

1. Non-formal and informal education

According to the Council of Europe non-formal education “refers to planned, structured programmes and processes of personal and social education for young people designed to improve a range of skills and competences, outside the formal educational curriculum”¹. In particular, educational programmes that have been designed for non-formal education include any organised educational activity, which takes place either individually or as part of wider activity, aiming to reach specific educational goals at a specific target audience. For example, non-formal education programmes can take place in areas where young people meet, such as youth organisations, sports clubs, hobbies and interests’ groups, social and cultural events. It is important to note that, non-formal education achievements are usually difficult to certify.

According to the Council of Europe non-formal education should also be:

- voluntary
- accessible to everyone (ideally)
- an organised process with educational objectives
- participatory
- learner-centred
- about learning life skills and preparing for active citizenship
- based on involving both individual and group learning with a collective approach
- holistic and process-oriented
- based on experience and action
- organised based on the needs of the participants.

On the other hand, informal education is considered a lifelong learning process whereby people learn through several life experiences. Such experiences may be related to educational influences and resources upon which a person comes across on his/her own environment and/or to daily experiences which are obtained through interactions with people and objects. Such type of learning is often unplanned and unstructured² and may result to the development of one’s attitudes, values, skills and knowledge. Informal learning is free from regulations and restrictions and as such it can take place anywhere, e.g. during family gatherings, in the market place, at the library, at various social events, at work and through playing, reading and sports activities.

In today’s societies, due to the rapid production of new services and tools, the risk of knowledge becoming obsolete is more probable than ever before. In this regard, both non-formal and informal learning bring value and significance to people who wish to remain at the forefront of technological change. Additionally, technological innovations have brought significant opportunities to the education sector which can support instructors to increase motivation and participation to both types of learning. One such example is gamification which according to Tang and Hanneghan (2015)

1 Council of Europe (n.d.). *Non formal education*. Retrieved from: <https://www.coe.int/en/web/european-youth-foundation/definitions>

2 Council of Europe (n.d.). *Informal education*. Retrieved from: <https://www.coe.int/en/web/european-youth-foundation/definitions>

offers “a viable alternative to existing computer-aided learning technologies that can assist in persuading and encouraging digital natives to acquire knowledge” (p. 581).

The digital escape room methodology can be utilised to reach youth in both non-formal and informal settings. In particular, in non-formal settings, the methodology can be applied to the development of activities which can be supplementary to already existing programmes. Such activities may be used, for example, as ice-breaking activities, or activities that support knowledge application and assessment of learning. Additionally, the digital escape room methodology can be employed holistically to support the development of programmes as a whole; such programmes can be structured to support both individual and group learning.

On the other hand, when designed to support informal learning, digital escape rooms should offer young people a number of choices to take up learning on their own initiative. In particular, educators can utilise mobile technologies and online spaces to which young learners are accustomed to, e.g. social media, in order to share a number of interesting resources. To add, educators, can create digital escape rooms which support reflection activities that prompt learners to ask questions, do some research on a topic and/or communicate their thoughts and opinions via the use of an online forum or a chat room. Lastly, educators can create digital escape rooms for special occasions, such as youth competitions, training seminars, happy hour sessions, etc. which can provide the necessary conditions for knowledge transfer. In order for informal learning to be successful, educators need to first and foremost take into account their learners’ profile, learning needs and interests.



Reflection activity:

Which topics can motivate young people the most in order to take up learning on their own initiative?

2. Gamification: benefits and characteristics

The adoption of new technologies by younger generations has significantly changed the ways they work, communicate, socialise and play. At the same time this immersion in technology has also affected the way younger generations learn. In order to attract and retain diverse groups of learners, educators need to embrace the learners’ digital cultures and address the additional challenges in providing high-quality education (Tang, Hanneghan & Rhalibi, 2009).

One of the most popular activities of young people in the digital age is digital gaming. While the paradigm of adopting games in some form can be traced back to the earliest civilizations existed hundred thousand years ago (Clarke et al., 2016), according to Prensky (2001), computer games are potentially the most engaging pastime in the history of mankind. Additionally, he suggests that such engagement is the result of the combination of twelve elements:

1. Games are a form of fun, which gives us enjoyment and pleasure.
2. Games are form of play, which gives us intense and passionate involvement.
3. Games have rules, which gives us structure.
4. Games have goals, which gives us motivation.
5. Games are interactive, which gives us doing.
6. Games are adaptive, which gives us flow.

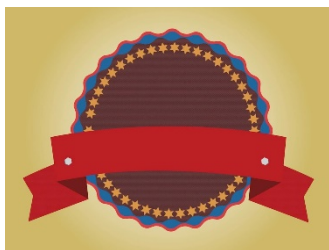
7. Games have outcomes and feedback, which gives us learning.
8. Games have win states, which gives us ego gratification.
9. Games have conflict/competition/challenge/opposition, which gives us adrenaline.
10. Games have problem solving, which sparks creativity.
11. Games have interaction, which gives us social groups.
12. Games have representation and story, which gives us emotion.

During the past years, the digital game medium has been adopted in areas beyond entertainment. An emerging strategy that is gaining ground in this area is gamification (Seaborn & Fels, 2015). In particular, gamification has been a trending topic in different contexts, from academic to managerial and business environments (Hamari, Koivisto, & Sarsa, 2014). Zichermann and Cunningham (2011) offer a number of examples on how companies are utilising gamification principles to meet their objectives, from loyalty cards to rewards and cash prizes which can be redeemed by costumers.

The term gamification refers to the application of game design techniques to non-game contexts (Deterding et al. 2011). It also refers to the process of using elements of games, such as points, badges and challenges in order to “*encourage learners to engage with content and to progress toward a goal*” (Kapp, 2012, p. 56). From an educational perspective, gamification can be effective when it is used to encourage learners to progress through content, motivate action, influence behaviour, and drive innovation (Kapp, 2012).

During the design process, the elements of gamification can be utilised in different ways. According to Kapp (2012) instructors can gamify either the content or the structure in order to make it more “game-like”. Examples of gamification elements which can transform the instructional content include, among others, the creation of a storyline and characters and the incorporation of multimedia elements, such as music, sound of graphics into the game. On the other hand, structural gamification refers to the application of game elements to guide learners through the content without changing it (Boskic & Hu, 2015).

The game mechanics



The term game mechanics describes the particular components of the game which are made up of a series of tools that aim to elicit a meaningful response from the players (Matallau, Hanner, & Zarnekow, 2015). Some of the common game mechanics include the points, the leaderboards, and the levels (Zichermann & Cunningham, 2011). Its element is described in detail below.

Points

Points are used as a reward system. They are awarded to players for successfully completing the tasks within the game. The point systems can be shared among players but this is not obligatory. Their importance lies in the fact that they provide valuable feedback to the game designer on how the players are interacting with the game (Zichermann & Cunningham, 2011).

Leader boards

The leader boards are related to the social aspect of the game as they offer players the opportunity to compare themselves to other players in a given ordered list. The use of leader boards is ubiquitous, as a very low score may discourage a player to abandon the given goals. For this reason, their design is considered a very delicate task.

Levels

The levels indicate progress. In particular, they are showing how the player has progressed during the game play from the simplest levels to the more progressive ones. Some examples of such mechanics are the progress bars and the badges. The levels do not have to evolve in a linear manner, and the designer could often substitute their use by integrating a badge system.

The game design

The creation of original educational programs can create new opportunities to promote and support processes or goals, such as personalised learning and active participation. Properly designed games with the help of web-based programs can enhance the adoption of instructional innovations and bring significant changes in the learning process. In particular, the characteristics of game-based learning can support adult educators to improve their teaching practices.

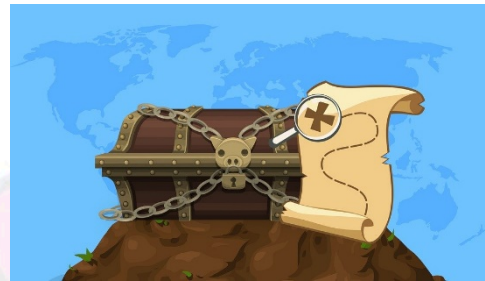
Tang, Hanneghan and Rhalibi (2009) have shared the characteristics of game-based learning as follows:

- motivating and engaging but not necessary entertaining;
- requires participation from learners;
- has clear learning objectives defined in the game-play and scenarios presented while knowledge can be imparted through storytelling and narrative;
- scenarios defined are reflective and transferable to the real-world experience;
- provides freedom to interact in the game world through a set of defined actions;
- provides clearly defined feedback for every action taken;
- both assessment and lesson can take place during game-play;
- matches learner's pace and intellectual ability;
- highly scalable so can be used for educating large numbers of learners concurrently (Tang, Hanneghan & Rhalibi, 2009, p. 3).

Gamification or game-based learning integrates effective and desirable learning approaches for adults along with the utilisation of the newest technologies like computers and mobile devices. These learning approaches include active learning, experiential learning and situated learning (Tang, Hanneghan & Rhalibi, 2009).

Active learning

Learners need to participate to activities which have been designed to engage and



maintain their interest. Such type of activities should encourage them in the act of doing and thinking what they are doing and should allow them to explore and develop their own understanding of the subject area presented. Additionally, game-based learning should provide opportunities for practice and experimentation while learners approach the game challenges.



For more information on active learning visit the following webpage:

<https://cft.vanderbilt.edu/wp-content/uploads/sites/59/Active-Learning.pdf>

Experiential learning

The term experiential learning is associated with Kolb's "Learning Cycle Theory" which describes a model of the adult experiential learning process. This model suggests that expertise is a continuous process of four stages: Concrete Experience, Reflective Observation, Abstract Conceptualisation and Active experimentation. In game-based environments the experience is important in the process of learning. In particular, by participating in interactive activities in the form of challenges which apply causal-effect relationships, learners can develop their knowledge and skills.



For more information on experiential learning visit the following webpage:

https://tru.uni-sz.bg/tsj/Volume2_4/EXPERIENTIAL%20LEARNING.pdf

Situated learning

Situated learning in game play should offer experiences which are placed in a context in which they are developed and used. Such type of learning should aim to bridge the gap between the learning of theory and the application of knowledge. Game-based learning can provide meaningful learning experiences that are embedded in authentic situations, and provide learners the opportunity to practice their knowledge safely in the game environment.



For more information on situated learning visit the following webpage:

<https://core.ac.uk/download/pdf/11237436.pdf>



Reflection activity:

Which software tools can support the incorporation of game mechanics to the learning process?

3.Applying the principles of gamification to the development of digital escape rooms

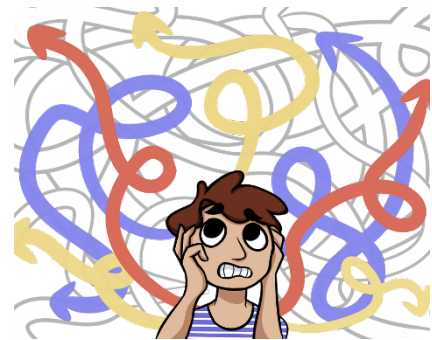
Escape room games refer to the process during which players must escape from a room that includes a number of challenges, usually within a specific time limit (Wiemker, Elumir & Clare, 2015, p. 2). In non-formal and informal educational settings, digital escape rooms can be developed in a competence-oriented way and incorporate challenges that will allow learners to solve them while utilising the knowledge and skills from an area of competency.

In this section we present a set of recommendations in order to support adult educators to create effective educational escape rooms for different skills areas.

Incorporate problem-solving tasks

Games can provide a framework for problem solving which focuses on strategies to solve problems during the challenges. While the nature of challenges that constitute the problem can vary greatly, in general, all games present a goal which calls for problem solving actions. Some examples include the following:

- Find a way to get more points than the other team.
- Find a way to get to the finish line before the other players.
- Find a way to complete this level.
- Find a way to destroy the other player before he destroys you (Schell, 2008).



Digital escape room challenges should incorporate the mental mechanisms people use for problem solving. In particular, the game itself may be presented as the big problem that is composed of smaller causally linked problems. Generally, a problem can be anything that involves the player to investigate something in order to progress in the game. The problems can be classified into well-structured or ill-structured problems:

- **Well-structured problems:** these are the problems that have definitive answers.
- **Ill-structured problems:** these are the problems people normally encountered in real life. As such, they present incomplete information and they have unclear goals. The best solutions to ill-structured problems depend on the priorities underlying the situation (Kiili, 2005).

The process of problem-solving during play can be associated with discovery learning. In this regard, educators can utilise the game environment as a means to offer possibilities to learners to set personal goals, to actively handle and gather information, and monitor and evaluate problem-solving processes (Kiili, 2005).

Present unifying themes



The theme refers to what the game is about. It is the idea that ties the entire game together along with all the elements that support it. Most game themes are experience-based which means that the aim of the design is to enhance the player's experience.

Educators need to decide on the game theme as

soon as possible, because the sooner they have settled on a theme the easier would be to decide which information belongs to the game or not: The information that reinforces the theme, stays; the information that doesn't, goes. Sometimes the theme emerges as educators are working towards the creation of the game.

By placing an emphasis on a single theme, educators can add elements that will reinforce one another toward a common goal.

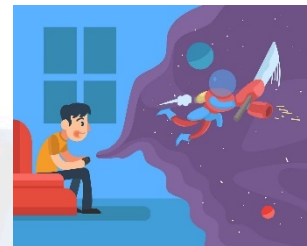
Schell (2008) advises game designers to learn about their audience preferences in order to strengthen the power of their themes.

Create a meaningful experience

Salen and Zimmerman (2003) in their book "Rules of Play" focus on one important concept in making a successful game which is *Meaningful Play*. The concept of meaning in escape room challenges can be applied as follows:

- the actions a player take have to be **discernible**: the player understands the result of what they are doing;
- the actions a player take have to be **integrated**: the actions the player takes in the game make a difference (Nicholson, 2016).

In practice, educators need to create challenges which have a purpose and they are tied into the larger narrative, giving players a way to find meaning in their actions; thus avoid incorporating puzzles and tasks are not simply there to be barriers to winning the game (Nicholson, 2016).



Nicholson (2016) proposes educators when designing the game to apply as simple strategy called "**Ask Why**". In detail, a designer should look at each element of an escape room game and ask "**Why is this here?**". This process will ensure that each puzzle, task, and item in the escape room is there for a reason that is consistent with the overall concepts behind the design of the game (Nicholson, 2016).

Additionally, games should provide an engaging learning environment which will allow the players to explore phenomena, test hypotheses and construct objects by reflecting on their experiences. Kiili (2005) stated that games that are based only on trial and error, do not enhance learning.

Balance the narrative to engage learners

One fundamental part of the game design is the narrative. While almost every game has some sort of story attached to it, the story should be presented in small pieces without overwhelming the player with lots of information at once.

In particular, the narrative of the game should unfold progressively in order to allow the players to develop a deeper understanding of the game settings, as they progress from one challenge to another. If, already from the beginning, the game requires a deep engagement with the setting, the players may be confused. For this reason, it is important for the backstory to be partly exposed to players through the game challenges. According to Nicholson "*if the game does not create the situation for players to get more deeply engaged with the setting, then the player can be forgetful of the role they are supposed to be taking*" (p.7). The story content needs to

be balanced in small pieces instead of placing lengthy story texts during the pre-game narrative (Nicholson, 2016).

According to Van Eck (2006), games “*thrive as teaching tools when they create a continuous cycle of cognitive disequilibrium and accommodation while also allowing the player to be successful*” (Van Eck, 2006, p. 5).

Provide instant feedback



Feedback is very important in the game play, especially if it is provided instantly. In particular, the provision of quick feedback can encourage the learners to modify elements of their strategy in order to progress through the game.

Feedback can also take place in the form of “hints”, especially when a particular challenge requires a specific approach (López-Pernas, Gordillo, Barra, & Quemada, 2019). Through the provision of hints educators can support learners in overcoming one challenge and move on to the next.

“Games are the only force in the known universe that can get people to take actions against their self-interest, in a predictable way, without using force.”

Gabe Zichermann



Reflection activity:

Think of an example of a problem-solving task that can attract the interest of young people in the learning process.

4.Recommendations for utilising the digital escape room methodology to formal and non-formal educational settings

Below there is a recommendations list on how to utilise the digital Escape Room methodology in formal and non-formal education settings.

Technical features:

- When applied in non-formal settings, perform the game activity in a single session for all participants whenever possible to promote discussion and exchange of experiences;
- When applied in informal settings, make sure that the user interface is easy to navigate and appealing;
- Use a points system, in order to motivate learners to review their progress;
- Keep track of the learners' performance using a progress bar;
- Use feedback-oriented approaches; provide and collect feedback to improve future editions.

Content development features:

- Use narrations and real-world contexts in line with the learners' personal interests;
- Design activities that will promote intrinsic and extrinsic motivation and will encourage learners to take action, e.g. towards climate change;
- Design stimulating challenges that will present "role models" and will enhance learner's curiosity to explore more;
- Create/use meaningful stories to promote emotional involvement, e.g. empathy;
- Enhance the game environment via the use of multimedia elements to present an appealing story.

Digital Resources for Learning Theories Applicable in Gamification

Resource Title: Studying Gamification: The Effect of Rewards and Incentives on Motivation

Learning Theories: *Needs-Based Theories, Social-Based Theories, Rewards-Based Theories*

URL: <http://www.meydalle.info/meydalle/ganit/9783319102078-c1.pdf>

Resource Title: Gamification from the Viewpoint of Motivational Theory

Learning Theories: *Motivational Theory*

URL: <https://pdfs.semanticscholar.org/2eb4/74f1f35e85bc47642c0e2cd4a9dbeed69495.pdf>

Resource Title: Gamifying education: what is known, what is believed and what remains uncertain: a critical review

Learning Theories: *Self Determination Theory, The Theory of Gamified Learning*

URL: <https://educationaltechnologyjournal.springeropen.com/articles/10.1186/s41239-017-0042-5>

Resource Title: Digital game-based learning: Towards an experiential gaming model

Learning Theories: *Experiential Learning Theory, Flow Theory*

URL: http://www.savie.ca/sage/articles/940_300027-kiili-2005.pdf

Resource Title: A Theory of Gamification Principles Through Goal-Setting Theory

Learning Theories: *Goal-setting Theory*

URL: <https://uwspace.uwaterloo.ca/bitstream/handle/10012/13720/2018-A%20Theory%20of%20Gamification%20Principles%20Through%20Goal-Setting%20Theory.pdf?sequence=1>

Resource Title: Gamification: State of the Art Definition and Utilization

Learning Theories: *Self-determination Theory, the Flow Theory*

URL: <https://d-nb.info/1020022604/34#page=39>

Digital Resources for Creating a Escape Room Challenges

Resource Title: Resources For Creating Digital Breakouts: Ideas For Making Your Own Activities

Description: *This resource includes useful ideas about for the creation of activities for digital escape rooms using text, articles, video, songs, questions and visuals.*

URL: <http://www.meydalle.info/meydalle/ganit/9783319102078-c1.pdf>

Resource Title: Breakout EDU “Build Your Own”

Description: *This resource provides different examples on how to create digital escape room activities through a series of screen casts.*

URL: <https://sites.google.com/site/digitalbreakoutjb/how-to>

Resource Title: Digital Escape Rooms With ThingLink & Google Forms

Description: *This resource presents two examples of digital escape rooms for the subjects of Physics and Chemistry.*

URL: <https://www.instructables.com/id/Digital-Escape-Rooms-With-ThingLink-Google-Forms/>

Digital Resources for Using Multimedia Elements in Game Design

Resource Title: WISC ONLINE Game Builder

Features: *creation of online games: bingo, flashcards, trivia, crossword, handmoon, matching game., memory match, sequence, jeopardy, spin to win, time out,*

URL: <https://www.wisc-online.com/gamebuilder>

Resource Title: Classtools Net

Features: *creation of online games: random name picker, fakebook (imaginary profiling), the vortex (sorting game), fling the teacher, arcade game, QR treasure hunt, crossword*

URL: <https://www.classtools.net/>

Resource Title: DISCOVERY EDUCATION

Features: *creation of online games: word search, criss-cross, double puzzles, fallen phrases, math squares, mazes, letter tiles, cryptograms, number blocks, hidden message*

URL: <http://puzzlemaker.discoveryeducation.com/>

Resource Title: Badge Creator

Features: *design digital badges*

URL: <https://www.accreditable.com/badge-designer/>

Resource Title: KeepTheScore

Features: *online software for scorekeeping*

URL: <https://keepthescore.co/>



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LUOVA

**USING ONLINE ESCAPE ROOMS TO
BUILD CREATIVE THINKING SKILLS**

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Introducing Online Escape Room learning

As educators and as humans we are surrounded by challenges – they are large, small, local, global, short, and long term etc. Some we rise to, some we dread, some we try to address, some we try to ignore.

Ultimately, how we individually and communally respond to challenges will ultimately determine our future. The often- hectic pace of school, work, family, and social life rarely gives us time to consider different perspectives and design thoughtful solutions.

When and how do we learn how to address challenges and create sustainable solutions?

Without an effective and efficient framework to think more deeply, we often repeat the same mistakes and can overlook innovative ideas. As problems become increasingly complex and intertwined the need to develop a generation of engaged and critical learners equipped to identify different challenges and develop innovative and sustainable solutions is crucial.

Challenge-based learning – of which online escape room learning is one example - is an effective learning framework first initiated at Apple, and now used in universities, projects and institutions around the world. The framework can empower learners, students, teachers, administrators, and community members to address local and global challenges while acquiring content knowledge in a whole range of subjects.

Through Online Escape Room Learning, students and teachers can make a difference and prove that learning can be deep, engaging, meaningful and purposeful.

For the hundreds of millions of people involved in formal education all around the world – the majority of these learners are focused on acquiring the knowledge and skills necessary to move to the next educational level and eventually enter the world as a productive member of society. Online escape room learning provides a framework for participants to accomplish this while building 21st century skills, developing a framework for life-long learning, and making an immediate impact on the world.

Imagine millions of empowered learners focused on creating solutions to local and global challenges as part of their schoolwork. We have the power to make the world a better place.

This document will provide the following **key learning outcomes**:

- Understand the technical requirements needed to make a digital escape room
- Use Google Forms or Google Sites software, to create challenges, puzzles and activities
- Find appropriate resources to build digital escape room challenges

- Acknowledge the different types of puzzles and challenges
- Use several ways to generate ideas for online challenges
- Have tools/apps to boost creativity

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Get ready!

1. We are all learners – We are all teachers

By moving beyond the traditional hierarchy of the school and classroom, we can create environments where all stakeholders can work together to meet academic objectives while solving authentic challenges around us.

Online educational escape rooms are just some of the tools that have been developed by pedagogic and game-theory experts, as vehicles to present challenge-based learning content to learners of all ages and abilities. While we are all familiar with traditional escape rooms; the benefits of transferring escape rooms online and using them for educational purposes is that firstly, there is no cost requirement as these resources are typically built on Google Forms or Sites and these are freely available. In this sense, the only limitation placed on developing these online challenges is the imagination of the creator of the challenges! In addition, by bringing these challenges online, you also have the potential to develop the digital skills of young people, and to support them to apply their digital skills to enhance their own learning.

When we speak of the theory behind developing online educational escape rooms, the pedagogic theory which supports these resources is the theory of challenge-based learning. Challenge-based learning emerged from the “Apple Classrooms of Tomorrow—Today” (ACOT2) initiated in 2008 to identify the essential design principles of a 21st-century learning environment. Starting with the ACOT2 design principles, Apple, Inc. worked with exemplary educators to develop and test challenge-based learning.

Challenge-based learning provides an efficient and effective framework for learning while solving real-world challenges. The framework is collaborative and hands-on, asking all participants (students, teachers, families, and community members) to identify big ideas, ask good questions, discover, and solve challenges, gain in-depth subject area knowledge, develop 21st-century skills and share their thoughts with the world.

Challenge-based learning, as presented through online educational escape rooms, builds on the foundation of experiential learning and leans heavily on the wisdom of a long history of progressive ideas. The framework is informed by innovative ideas from education, media, technology, entertainment, recreation, the workplace, and society.

When faced with a challenge, successful groups and individuals leverage experience, harness internal and external resources, develop a plan and push forward to find the best solution. Along the way, there is experimentation, failure, success and ultimately consequences for actions. By adding challenges to learning environments the result is urgency, passion, and ownership - ingredients often missing in schools.

Challenge-based learning, through online educational escape rooms, is a flexible framework; with each implementation, new ideas surface, the framework is

reviewed, and the model evolves.

2. Challenge-based learning, a multi-faceted learning tool

Challenge-based learning provides a significant list of advantages, when compared to traditional learning approaches. These include:

- A flexible and customizable framework that can be implemented as a guiding pedagogy or integrated with other progressive approaches to learning.
- A scalable model with multiple points of entry and the ability to start small and build big.
- A free and open system with no proprietary ideas, products, or subscriptions.
- A process that places all learners in charge, and responsible for the learning.
- An authentic environment for meeting academic standards and making deeper connections with content.
- A focus on global ideas, meaningful challenges, and the development of local and age appropriate resources.
- An authentic relationship between academic disciplines and real-world experience.
- A framework to develop 21st-century skills.
- Purposeful use of technology for researching, analysing, organising, collaborating, networking, communicating, publishing, and reflecting.
- The opportunity for Learners to make a difference now.
- A way to document and assess both the learning process and products.
- An environment for deep reflection on teaching and learning approaches.

A consistent vocabulary is critical to the success of all frameworks and plans. If there are disagreements, stated or unstated, about language at the beginning, the end results will be unsatisfactory.

3. Everyone is a learner

Ubiquitous access to information creates the opportunity to break down the traditional hierarchical structure of learning environments. In this new paradigm, all stakeholders become teachers and learners. The learners (young people, youth workers, teachers, administrators, families and community members) actively share the responsibility (and workload) for creating and participating in the learning experience. The framework does not diminish or demean the role of teachers, youth workers and other adults in the learning environment as they still have the primary responsibility for a successful learning experience. It does relieve the burden of having to do all of the work by deeply involving young people throughout the entire process. Youth workers continue to teach and lead the group sessions, but now have the freedom to learn with the young people in their group. Young people continue to learn but now share in the responsibility of defining the journey, aligning to standards, acquiring resources and teaching.

4. Moving beyond the four walls of a classroom

Involving community members in the process expands resources, creates opportunities for authentic learning and moves the responsibility of education to the larger community.

5. Learners inspired; Learners directed

Meaningful connections are made between content and the lives of learners. The more passionate learners are about the content, the deeper the learning, the more control all participants have over the process, the higher the level of ownership.

6. Challenges

Challenge are posed to the learners as situations or activities that create a sense of urgency and spur action among learners to complete the task.

7. Content and 21st century skills

Authentic learning experiences foster in-depth content knowledge and help students organically develop 21st-century skills such as creative and critical thinking, collaboration, communication, information literacy, flexibility... These skills do not become "one more thing" to be addressed by the teacher but emerge from the challenge experience.

8. Boundaries of Adventure

Boundaries are provided to guide the way and provide freedom for learners to take ownership of the process. At the beginning or in specific situations, the limits will be narrow, but the goal is always to move towards more freedom and responsibility for the learner.

The idea of "Boundaries of Adventure" comes from experience guiding wilderness trips. When coming onto camp, the guides set boundaries of adventure to provide the campers with enough space to have an adventure while keeping them safe. As the trip progresses and the campers became more skilled, the boundaries increased until the campers set their own boundaries.

9. Space and Freedom to Fail

Provides a safe space for all learners to think creatively, try new ideas, experiment, fail, receive feedback, and try again. All the phases of the framework include opportunities for iteration.

10. Slowing for Critical and Creative Thinking

To ensure full participation and to provide opportunities for deep thinking, the learning process is intentionally slowed down at times.

11. Authentic and Powerful Use of Technology

Technology is used to research, communicate, organise, create and present information. The use of technology allows learners to own and transform the learning experience.

12. Focus on Process and Product

The journey to the solution is valued as much as the solution. Throughout the challenge-based learning experience there are opportunities to evaluate and assess both the process and the products and outcomes of the learning.

13. Documentation

During each step of the challenge process, the learners document and publish using text, video, audio and pictures. These artefacts are useful for ongoing reflection, informative assessment, evidence of learning, portfolios and telling the story of their challenge.

14. Reflection

Throughout the process, learners continuously reflect on the content and the process. Much of the deepest learning takes place by considering the process, thinking about one's learning, and analysing ongoing relationships between the content and concepts.



The Framework

- An incremental process

The challenge-based learning framework is an incremental and flexible process which can be divided into three interconnected phases, as follows:

- **Phase 1:** Engage,
- **Phase 2:** Investigate,
- **Phase 3:** Act.

Each phase includes activities that prepare learners to move to the next stage. Supporting the entire process is an ongoing process of documenting, reflecting and sharing.

Phase 1: Engage

Through a process of essential questioning, the learners move from an abstract idea to a concrete and actionable challenge.

- 'Big Ideas' are broad concepts that are explored in multiple ways and are relevant to the learners, and the larger community (e.g. health).
- Essential questioning allows the learners to contextualise and personalise the 'Big Idea'. The end product is a single essential question that is relevant to the individual or group (e.g. What do I need to do to be healthy?)
- Challenges turn the essential questions into a call to action by charging participants to learn about the subject and develop a solution. Challenges are immediate and actionable.

Phase 2: Investigate

All learners plan and participate in a journey that builds the foundation for solutions and addresses academic requirements.

- Guiding questions point towards the knowledge the learners will need to develop a solution to the challenge. Categorising and prioritising the questions create an organised learning experience. Guiding questions will continue to emerge throughout the experience.
- Guiding activities and resources are used to answer the guiding questions developed by the learners. These activities and resources include any, and all, methods and tools available to the learners.
- Analysis of the lessons learned through the guiding activities provides a foundation for the eventual identification of solutions.

Phase 3: Act

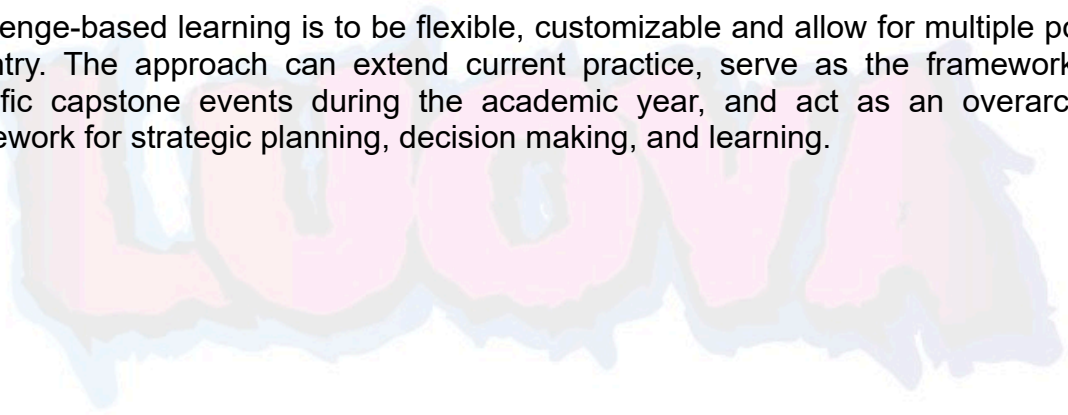
Evidence-based solutions are developed, implemented with an authentic audience, and then evaluated based on the results.

- Solution concepts emerge from the findings made during the investigation phase. Using the design cycle, the learners will prototype, test and refine their solution concepts.
- Implementation of the solution takes place within a real setting with an authentic audience. The age of the learners, and the amount of time and resources available, will guide the depth and breadth of the implementation.
- Evaluation provides the opportunity to assess the effectiveness of the solution, make adjustments and deepen subject area knowledge

Before diving deeper into challenge-based learning, through tools such as online educational escape rooms, some thinking about planning and preparation is necessary.

- A flexible approach

Challenge-based learning is to be flexible, customizable and allow for multiple points of entry. The approach can extend current practice, serve as the framework for specific capstone events during the academic year, and act as an overarching framework for strategic planning, decision making, and learning.



Types of Challenges

Challenge-based learning should not be “one more thing” added to youth worker or young person’s full plates. The framework is designed to provide structure for current best practices and make logical connections.

Challenge-based learning becomes the framework that holds everything together. For example, a STEM Challenge is combined with service learning resulting in community-based solutions that involve coding or products created in Maker Spaces (a makerspace is a collaborative work space inside a school or a library facility where young learners have an opportunity to explore their own interests; learn to use tools and materials, both physical and virtual; and develop creative projects.)

Here you see that ideas are provided for putting challenge-based learning into practice. These ideas build on each other and provide the scaffolding to move from individual challenges to organisation-wide implementations.

When considering challenge-based learning, through activities such as online educational escape rooms, think about how the framework fits with personal and institutional learning goals and how it can be implemented and supported.

At the macro level, challenge-based learning through these online resources is an overarching philosophical approach that uses a framework of challenges to inform and guide strategic decision making, curriculum development, and classroom practice.

Challenges create a **sense of urgency** and **spur action**. In challenge-based learning, they include a specific structure (engage, investigate and act), vary in duration and intensity and can be incorporated or adapted to most learning environments. Designed variations of challenges that have emerged include:

Nano Challenges

Nano challenges are shorter in length, focus on a specific content areas or skills, have tight boundaries and are more teacher or youth worker directed. Learners typically start with the challenge without identifying a big idea or essential question. The process includes the investigation and act phases, but at a significantly lower level of intensity and often stop short of implementation with an external audience. Typically, Nano Challenges are used as scaffolding leading to more significant challenges or during longer challenges to address specific concepts. Online educational escape rooms are examples of nano challenges.

Mini Challenges

Mini challenges widen the boundaries and provide learners with an increased level of choice and responsibility. An increase in duration allows the learners to start with a big idea and work through the entire framework. The research depth and the reach of their solutions increases, and the focus can be content specific or multi-disciplinary. Taking a “show me what you can do” perspective, Mini Challenges are good for intense learning experiences that stretch the learners and prepare them for longer challenges.

Standard Challenges

Standard challenges are longer and allow considerable latitude for the learners. Working together, learners can identify and investigate big ideas, develop challenges, do extensive investigation across multiple disciplines, and take full ownership of the process. The framework is used from start to finish, including implementation and evaluation of the solution in an authentic setting.

Capstone Challenges

Capstone Challenges are standard challenges used as a culminating academic and intellectual experience for the learners. Examples include a grade level challenge that ends the year in a content area or a senior project that acts as a “thesis” for graduation.

Strategic Challenges

Strategic challenges are for planning at the institutional level. Any organisation can use the framework to define the mission, identify Challenges, create a common language and developed strategic plans. Big ideas like time, achievement, learning, technology and school culture are perfect for starting deep and important conversations. Strategic challenges can be used with young people to encourage them to visualize the future of youth-work, for example.

This list is not designed to be an exhaustive or prescriptive set of challenge approaches. The framework is adaptable to meet the needs of your context.

Examples of Challenge-based Learning through Online Educational Escape Rooms

COMMUNICATION & SELF-EXPRESSION

- Introductory level
https://docs.google.com/forms/d/e/1FAIpQLSeaq-2GGzR8Wp-i_HgWKG6FeTq7AAhdV5NfHp9SOkRVJWnmDA/viewform?usp=sf_link
- Advanced level
https://docs.google.com/forms/d/e/1FAIpQLSd5v2OWkaFNImYgF4yoykvPaoKjpAo1nVREBD-JeHTyCz6E1g/viewform?usp=sf_link

MOTIVATION

- Introductory level
https://docs.google.com/forms/d/e/1FAIpQLSfnP31BWSAkVQPyDJ1UHndR3TKe2gFhsUTd2GjmZQEaNXUUEA/viewform?usp=sf_link
- Advanced level
https://docs.google.com/forms/d/e/1FAIpQLSeigK6-LwxP-Cwnm010TGolHx5am50XrYVru0PzJRGPIC9BOQ/viewform?usp=sf_link

COLLABORATION

- Introductory level
https://docs.google.com/forms/d/e/1FAIpQLSe6ziFLPsBBv-LdxoEBglOQSZo2ybFl6xWf2o9aqd3aaN-YaA/viewform?usp=sf_link
- Advanced level
https://docs.google.com/forms/d/e/1FAIpQLSdEjr63n4U3WsS3Bz_1Y3d3TdZLxxjkj7GxaLbUKPYZxuEchQ/viewform?usp=sf_link

IMAGINATION & ORIGINALITY

- Introductory level
https://docs.google.com/forms/d/e/1FAIpQLSdu9wpUwzmV3yB3angjex5znYeTH1n2uVb5kBQVgnM7jUwdg/viewform?usp=sf_link
- Advanced level
https://docs.google.com/forms/d/e/1FAIpQLSevMpSzKL7VZF7U4ClmXik0cp3fu0DB6LIK266wZKqigOTsyA/viewform?usp=sf_link

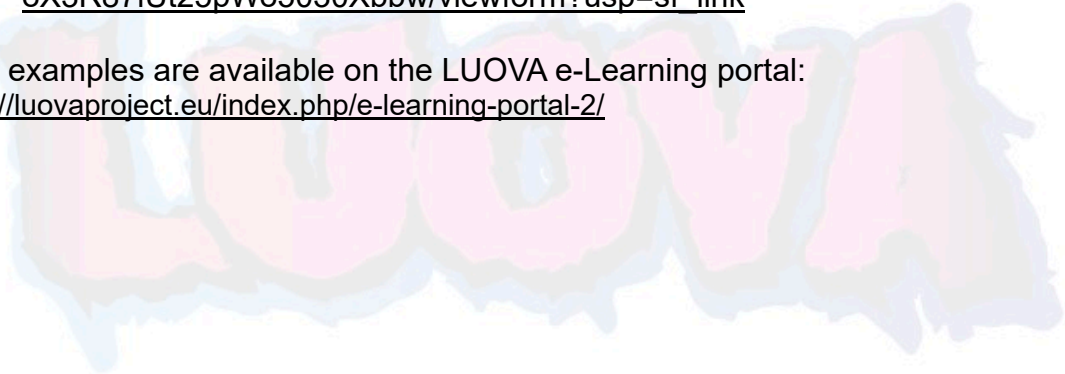
MENTAL FLEXIBILITY

- Introductory level
https://docs.google.com/forms/d/e/1FAIpQLScFSZ-H2V3Sh9pgcFqZdn2XvtC8uG5hzisXnPku8h6YyJoUnw/viewform?usp=sf_link
- Advanced level
https://docs.google.com/forms/d/e/1FAIpQLSeQjxyN6BITHaPhGRS6sgrNApJWqvBEF5ovB43zTWhJsilV3Q/viewform?usp=sf_link

DECISION-MAKING

- Introductory level
https://docs.google.com/forms/d/e/1FAIpQLSfel_hgthUYZkneFnaeDWRWi8Yb8jKkadECTeciRW4IxpviMw/viewform?usp=sf_link
- Advanced level
https://docs.google.com/forms/d/e/1FAIpQLSfvnfppk7IM_eNHN9ctiEwL7XHqoX3R87IUt25pWo5030Xbbw/viewform?usp=sf_link

More examples are available on the LUOVA e-Learning portal:
<https://luovaproject.eu/index.php/e-learning-portal-2/>



A step by step quick start to developing Online Educational Escape Rooms using Google Forms

Step 1 – Set up a Google account.

Step 2 – Conceptualise the problem. What kind of skills should the game improve? Which competences are you going to focus on?

Step 3 – Reflect on your target group. Who are they? What is their background, age and interests?

Step 4 - Develop a storyline. Keeping your target audience in mind, think about the theme or genre of your game. Where does the story take place and what kind of story is it? Some good inspirations are popular films, books, or games. Take your time with the narrative to make sure it is compelling and engaging. Explain the challenges to the learners so that they know what they have to do to pass to the next level. These can be presented using media-rich video files and then answered in a Google Form.

Step 5 – Start creating a digital escape room via Google Forms (*template provided in the next section*). Formulate questions that are presented as digital clues for the purposes of the game using attached images, YouTube videos, hyperlinks or links to other Google Docs documents. Adapt them to the required difficulty level.

Step 6 – Base the answers to these questions around different types of digital clues:

- digital competence: QR codes, YouTube videos, Google Maps coordinates, identifying locations, word count in a file, etc.
- civic competence: history/date of origin
- critical competence: mathematical tasks, abstract reasoning, lateral thinking,
- creative competence: ciphers and coding systems (Morse code, binary code...), foreign alphabets (Cyrillic, Arabic)
- Text - crosswords, word-searches, words written backwards, text written in white on a white sheet, text written in foreign languages, Google translate, anagrams.
- Photographs – naming famous sites, picking the odd-one-out, naming flags, counting items in a photograph.
- Online puzzles – making a jigsaw, patterns, and sequences.
- Navigation puzzles – reading an old map, calculating distance, using Google Maps

Step 7 – Select one of the options for collecting answers. Choose short answer text with response validation to make sure your target audience can only proceed to the next step after correctly solving a puzzle. They would normally be asked to type in a number or text equal to value. If you think the clue might be too difficult, provide them with an additional clue in form of custom error text displayed in case of an incorrect answer. Open text answers might be considered as a way of collecting answers to puzzles requiring discussions on an advanced level challenge.

Annexes

- Templates to prepare an Online Educational Escape Room Challenge

To facilitate the structuring of a Online escape room learning, learners can follow the following template guidelines which will help them to build their Google form challenge using the tutorial in the next step.

Also, it is recommended to divide the learners into groups where some could focus on the scenario while others could build the actual breakout into google form using this template.

Breakout challenges can be made at 4 different levels: **Introductory, intermediate, advanced and expert** and below are the recommended standards for the challenges.

These can be used to adapt later resources for the Final Platform.

- **Introductory** – 3 simple challenges – to include some images, video files, etc.
- **Intermediate** – 4 more complex challenges – to include some images, videos files and prompts for independent research.
- **Advanced** – 5 more sophisticated challenges – to include some prompts for independent research, QR codes and short quizzes.
- **Expert** – 6 challenges – including quizzes and games.

Remember to consider the following key points when developing resources:

- Keep the text to a minimum – this will reduce the amount of translation required.
- Ensure the resources are useful in other countries and contexts.
- Refer back to the Value Propositions to ensure learning is embedded into the materials
- Numbers don't need translating!

BLANK GOOGLE FORM TEMPLATE

Form title:

Room title	Topic & level	
	Title	
	Description	

To be used once per escape room challenge.

Form content:

Section #	Title	
	Description	

To be used once per section.

Section contents:

Normal paragraph	Title	
	Text or Media	

Question paragraph	Question	
	Short text	
	Answer	
	Hint	

This can be used as many times as required depending on the resources or level. Each section could end by saying “**congratulations!**” – in this section, reward the learner for solving the problem, riddle or puzzle posed – and progressing to the next level.

Example of a completed GOOGLE FORM Template

All section can be completed depending on the level of details desired and the number of sections the breakout will contain.

If the Online Educational Escape Room Challenge is about developing entrepreneurial skills, then the title could be chosen in relation to that topic, for example.

Form title:

Room title	Topic & level	Ex. <i>Entrepreneurial skills – Introductory level</i>
	Title	Project no. 41R
	Description	

Section 1	Title	Chapter 1. The beginning of the way.
	Description	

Normal paragraph	Title	You are an MI6 spy. You need to a specific location in the USSR to investigate some mysterious experiments taking place.
	Text or Media	[image1]

Normal paragraph	Title	Further instructions will be provided.
	Text or Media	Are you ready?

Section 2	Title	Crossing the border
	Description	

Normal paragraph	Title	You have been sent to Finland where you are about to cross the border without being caught. You need to meet your contact at a famous place somewhere in Ленинград...
	Text or Media	[image2]

Question paragraph	Question Short text	Where is your contact?
	Answer	Hermitage Museum

	Hint	2 words, 9 and 6 letters each, both starting with Capital Letters.
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Section 3	Title	Did you know?
	Description	Source: Wikipedia 2018.

Normal paragraph	Title	On 1 September 1914, the name of the city, Saint Petersburg, was changed to Petrograd, on 26 January 1924 to Leningrad, and on 1 October 1991 back to Saint Petersburg. During the periods 1713–1728 and 1732–1918, Saint Petersburg was the capital of Imperial Russia. In 1918, the central government bodies moved to Moscow.
	Text or Media	

Normal paragraph	Title	The State Hermitage Museum in Saint Petersburg, Russia is the second-largest art museum in the world, it was founded in 1764 when Empress Catherine the Great acquired an impressive collection of paintings from the merchant from Berlin, Johann Ernst Gotzkowsky.
	Text or Media	

Normal paragraph	Title	Antonio Canova's statue The Three Graces is a Neoclassical sculpture, in marble, of the mythological three charities, daughters of Zeus – identified on some engravings of the statue as, from left to right, Euphrosyne, Aglaea and Thalia – who were said to represent youth/beauty (Thalia), mirth (Euphrosyne), and elegance (Aglaea).
	Text or Media	

Section 4	Title	Route through Voronezh
	Description	

Normal paragraph	Title	After your contact gave you a new identity and Soviet documentation, you have been sent to Воронеж. At the railway station you receive a letter containing a map with a hidden message...
	Text or Media	[image3]

Normal paragraph	Title	Use the map
	Text or Media	https://www.google.ru/maps/@51.676436,39.2025939,16z
Question paragraph	Question	What is the name of the square where you will meet?
	Short text	
	Answer	Lenina
	Hint	1 word in Latin alphabet, 6 letters starting with a Capital Letter.

Section 5	Title	Did you know?
	Description	Source: Wikipedia 2018.

Normal paragraph	Title	Nikolay Gennadiyevich Basov (14th December 1922 – 1st July 2001) born in Voronezh was a Soviet physicist and educator. For his fundamental work in the field of quantum electronics that led to the development of laser and maser, Basov shared the 1964 Nobel Prize in Physics with Alexander Prokhorov and Charles Hard Townes.
	Text or Media	

Section 6	Title	Finding your contact
	Description	

Normal paragraph	Title	Once in the square, a kid gives you this message from your contact...
	Text or Media	[image4]

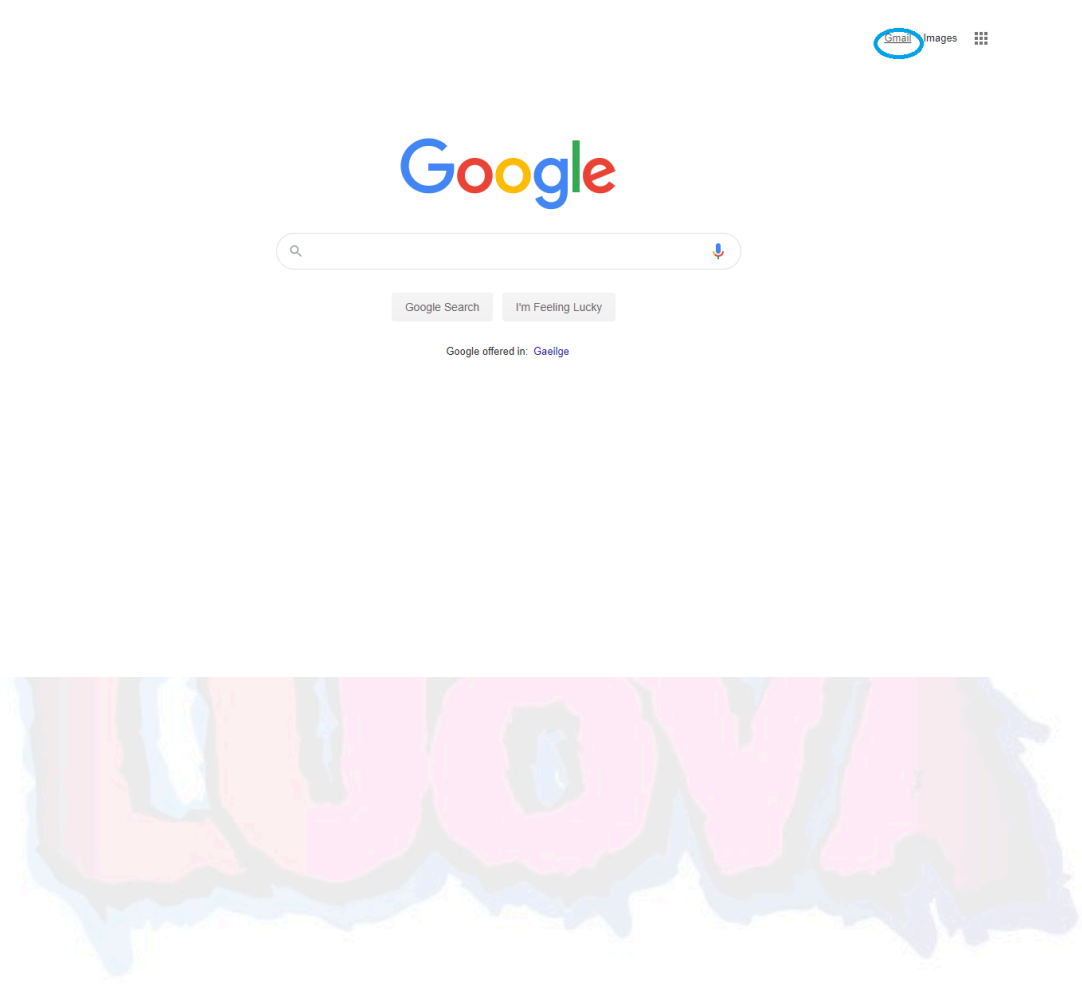
Question paragraph	Question	What feature does your contact have?
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	Short text	
	Answer	Beard
	Hint	First letter is a Capital!

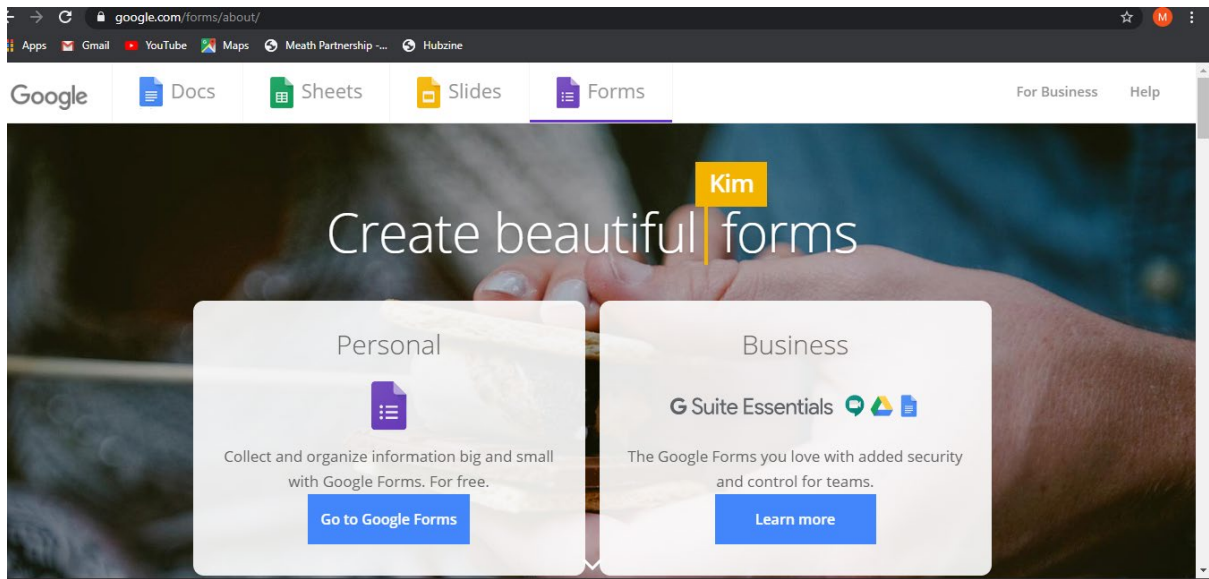
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- Practical steps to create Online Educational Escape Room challenge

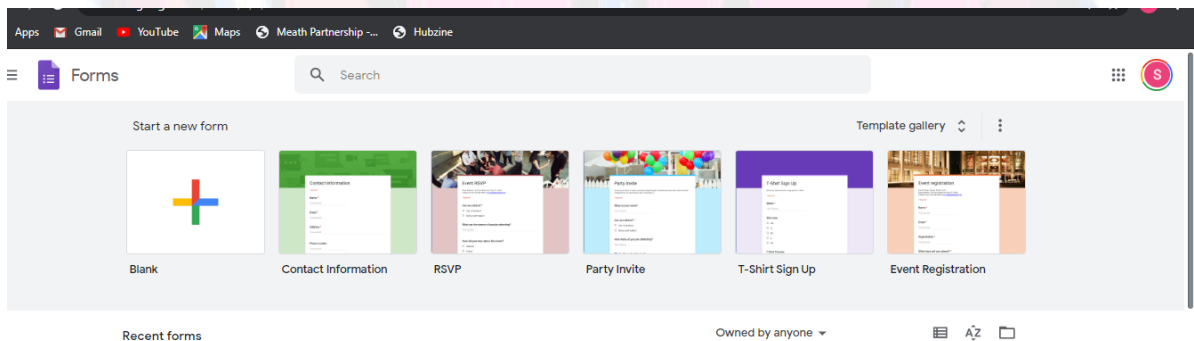
➤ **Step 1:** Create a Google account



➤ **Step 2:** Google search for “Google forms”



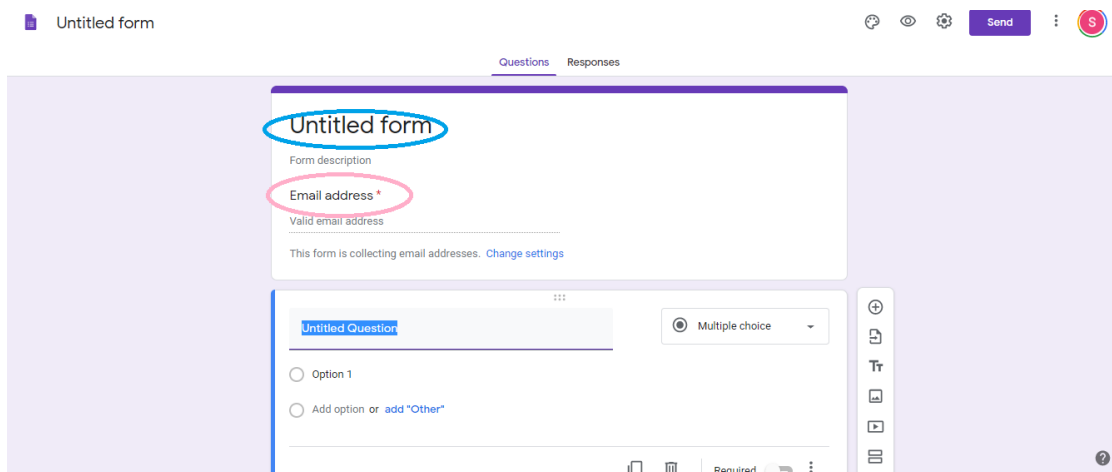
➤ **Step 3:** Select “Start a new form”



➤ **Step 4:** Start creating your Online escape room

1- Name your Online Escape room

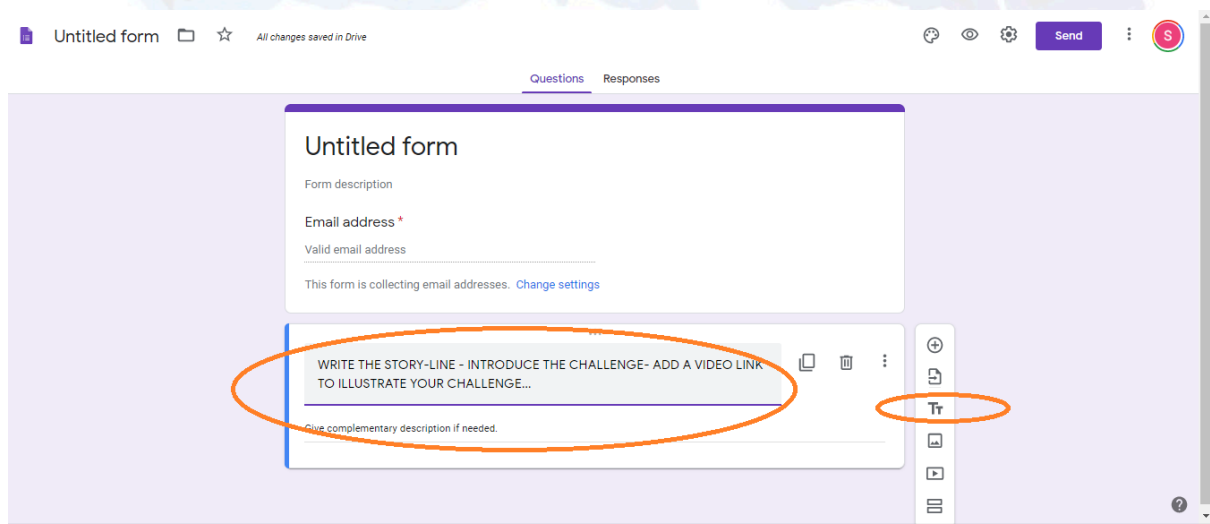
2- Enter your email address



The screenshot shows the Google Forms editor interface. At the top, there's a header with 'Untitled form' and navigation icons. Below the header, there are two tabs: 'Questions' and 'Responses'. The main form area contains a section titled 'Untitled form' with a description field. Below the description, there's a required text input field labeled 'Email address *' with a pink oval around it. Below this field is a placeholder text 'Valid email address' and a note 'This form is collecting email addresses. [Change settings](#)'. Below the email field, there's a question titled 'Untitled Question' with a 'Multiple choice' dropdown menu. The question has two options: 'Option 1' and 'Add option or add "Other"'. A vertical toolbar on the right side contains icons for adding sections, questions, and other elements.

➤ Step 5: Add a section to introduce your Online escape room storyline

1. Select the “TT” button to add a section
2. Name this section (optional)
3. Write down your story line, explain the challenge so the learners know what to do
4. Include videos, or images, or GIF clicking on the sliding menu at the right-hand side to make it more engaging and fun
5. Play around to find out all possible options
6. You can delete any option at anytime clicking on the “delete” icon



The screenshot shows the Google Forms editor interface after adding a new section. The section is titled 'Untitled form' and has a description field. Below the description, there's a required text input field labeled 'Email address *' with a pink oval around it. Below this field is a placeholder text 'Valid email address' and a note 'This form is collecting email addresses. [Change settings](#)'. Below the email field, there's a new section titled 'WRITE THE STORY-LINE - INTRODUCE THE CHALLENGE- ADD A VIDEO LINK TO ILLUSTRATE YOUR CHALLENGE...' with a pink oval around it. Below this section is a placeholder text 'Give complementary description if needed.'. A vertical toolbar on the right side contains icons for adding sections, questions, and other elements. The 'TT' button (add section) is highlighted with an orange oval.

➤ Step 6: Formulate your question

1. Base your question around different types of digital clues (see step by step section

above)

2. Select one of the options for collecting answers (short paragraph, multiple choices, checkboxes, short answers...)
3. Indicate if this format is requested or not to move on to the next level

This screenshot shows the 'Question' editor in a challenge creation tool. At the top, there is an 'Email address' field with a validation message 'Valid email address' and a note 'This form is collecting email addresses. [Change settings](#)'. Below this is a text area for 'WRITE THE STORY-LINE - INTRODUCE THE CHALLENGE- ADD A VIDEO LINKS OR PHOTOS TO ILLUSTRATE YOUR CHALLENGE...' with a sub-note 'Give complementary description if needed.' The main editor area contains a 'Question' field (labeled 1), a 'Multiple choice' dropdown menu (labeled 2), and a 'Required' toggle switch (labeled 3). The 'Required' toggle is currently turned on. A vertical toolbar on the right side of the editor contains icons for adding, deleting, and moving sections.

➤ **Step 7:** Add a new section and build the structure of your challenge by repeating the previous steps.

This screenshot shows the 'Add section' step in the challenge creation tool. The interface displays a 'Question' field with 'Option 1' and a 'Continue to next section' button. A new section, titled 'Untitled Section' (labeled 2), is being added below the question. The 'Add section' button in the vertical toolbar (labeled 1) is highlighted. The new section has a 'Description (optional)' field and a '2' in the bottom right corner.

GO

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**USING ONLINE ESCAPE ROOMS TO
BUILD CREATIVE THINKING SKILLS**

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Introduction and Aims

The Internet environment is something without which it would be difficult to imagine life now. The beginning of the Internet dates back to the late 1960s and the beginning of websites and web browsers to the 1990s. Since then, the fast-growing Internet environment has given us an infinite number of opportunities and potential for development in every area of life.

As is well known, the online environment is interactive. Thanks to the visualization of constantly developing functionalities of Internet technologies, it engages its users in making decisions and developing analytical thinking while searching for information resources and selection of collected data. The online environment is an attractive platform for sharing knowledge. Nowadays, more and more often we use the potential offered by the Internet environment and various applications for teaching both young people and adults. For this purpose, various types of e-learning tools are used which integrate different strategies and different scenarios for processing the presented data. The more strategies can be used, the more the learner can be involved at many levels of information processing and thus be interactive.

This Module aims to support front-line youth workers to harness the potential of the dynamic online environment and applications to build high-value skill sets within their marginalised target groups. In detail, the Module will provide insights on the teaching and learning processes which can be supported by the digital escape room methodology. Additionally, at the end of the Module, youth workers can find a rich pool of resources for the application of the digital escape room methodology to formal and non-formal educational settings.

Thanks to such rapid development of the Internet environment, new methods of knowledge acquisition and development of knowledge are being developed. One such example is the escape rooms. Thanks to expanding our digital literacy and efficient navigation in the Internet environment, social media and applications, we will be able to create our own escape rooms that will allow us to develop critical thinking and other key competence skills such as teamwork, decision making, results orientation or leadership.

In particular, upon the completion of the Module adult educators will be able to:

- Describe the benefits of digital collaboration;
- List the appropriate tools that boost creativity describe their use;
- Identify the social media netiquette;
- Develop digital literacy;
- Knowledge of online risks, and how to stay secure;

1. Dynamic developing online environment

The modern understanding of the online environment in its social and technological nature refers to social networking concepts. The key to understanding social networks are not only the characteristics of individuals or their associated values, but above all the links between them and the structures created by their influence. The number of links between the entities forming this network is virtually unlimited. In this sense, the Internet is the physical or technological representation of the symbolic links present in all social structures.

According to the IGI-Global dictionary online environment is “The virtual space in which a computed defined system can function being connected to other(s) connected systems through a communication electronic channel and sharing content.”³

Since 1991, when the project to create the World Wide Web was presented, the Internet environment has started to develop more and more rapidly. The breakthrough moment from which the rate of development and universality of the Internet environment grew at an astonishing rate was the creation of the google search engine in 1998. Since then, the online environment has become a common good for entertainment and learning.

Currently, the online environment has enormous potential and gives its users endless opportunities for development.

The policy of the European Commission supports a legal and innovation-based environment for Internet platforms in the EU. To achieve this goal, the Commission has identified key areas of interest in the May 2016 Communication on Internet platforms⁴. The guiding principles of this policy are as follows:

- A level playing field for comparable digital services;
- Ensure responsible behaviour of online platforms to protect core values;
- Foster trust, transparency and ensure fairness on online platforms;
- Keep markets open and non-discriminatory to foster a data-driven economy.

The Internet has a huge impact on education aimed at gaining knowledge, expanding creativity and acquiring skills. To achieve this you need a source of comprehensive information, which is the constantly developing Internet environment.

3 <https://www.igi-global.com/dictionary/online-learner-expectations/20966>

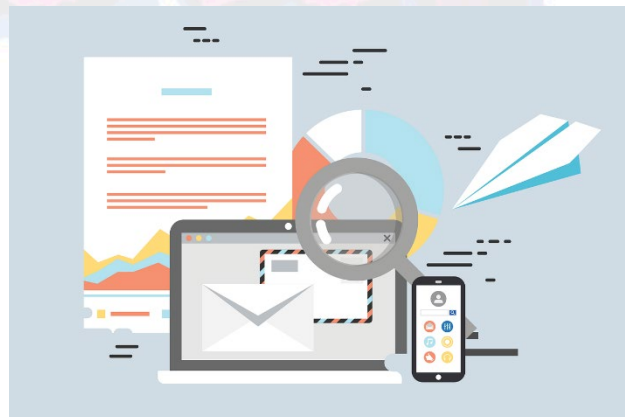
4 <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1466514160026&uri=CELEX:52016DC0288>

As a new medium, the Internet environment offers its users features such as:

- **Interactivity and cooperation**
the student has the ability to receive all kinds of messages and respond to them both synchronously and asynchronously. Effective communication gives the possibility of data exchange
- **Multimodality**
The Internet is a convergent medium - it contains messages in the form of text, image, animation film, sound. It is a polysensory medium
- **Hypertextuality**
The Internet is a collection of information published in a non-linear way that facilitates efficient redirection to related topics and keywords
- **Simplicity of exploration**
Internet search engines enable efficient access to the required and specially created tag systems help to organize and archive it

Digital collaboration

As technology becomes more and more integrated in our society, so does the phenomenon called digital collaboration. Digital collaboration is referred to as “the practice of people working together through online means such as software-as-a-solution (SaaS) platforms.”⁵ This allows people not only to work with each other through communication, but also provides digital tools to help achieve collaborative needs.



These tools will help learners not only to communicate but also to develop interpersonal skills, to improve digital literacy and creative thinking. According to a report presented by an American strategic management consultancy company - McKinsey - the use of appropriate tools and digital collaboration improves productivity from 20 to 30 percent. Here are examples of the digital tools most commonly used for digital collaboration:

Communication tools - There are many tools available on the market to support communication on the Internet and to improve digital collaboration. Taking into ac-

count the variety of methods and trends related to online communication, among the examples below you will find tools that can be used to organize webinars, video and audio conferences and online trainings.

- Flowdock
- WebEx
- GoToMeeting
- Zoom

Tools for creation - Creating and designing a given project, e.g. an escape room, is usually not a task for one person. Thanks to the following tools, you can collaborate in creating a project together in an online environment:

- Google docs / Google forms
- Quip
- igloo

Tools for managing projects and tasks - project management tools are essential for shared digital collaboration. They improve the task management process, organise documents and monitor deadlines.

- Dapulse
- Asana
- Redbooth
- Wimi
- Milanote
- Dropbox



Reflection activity:

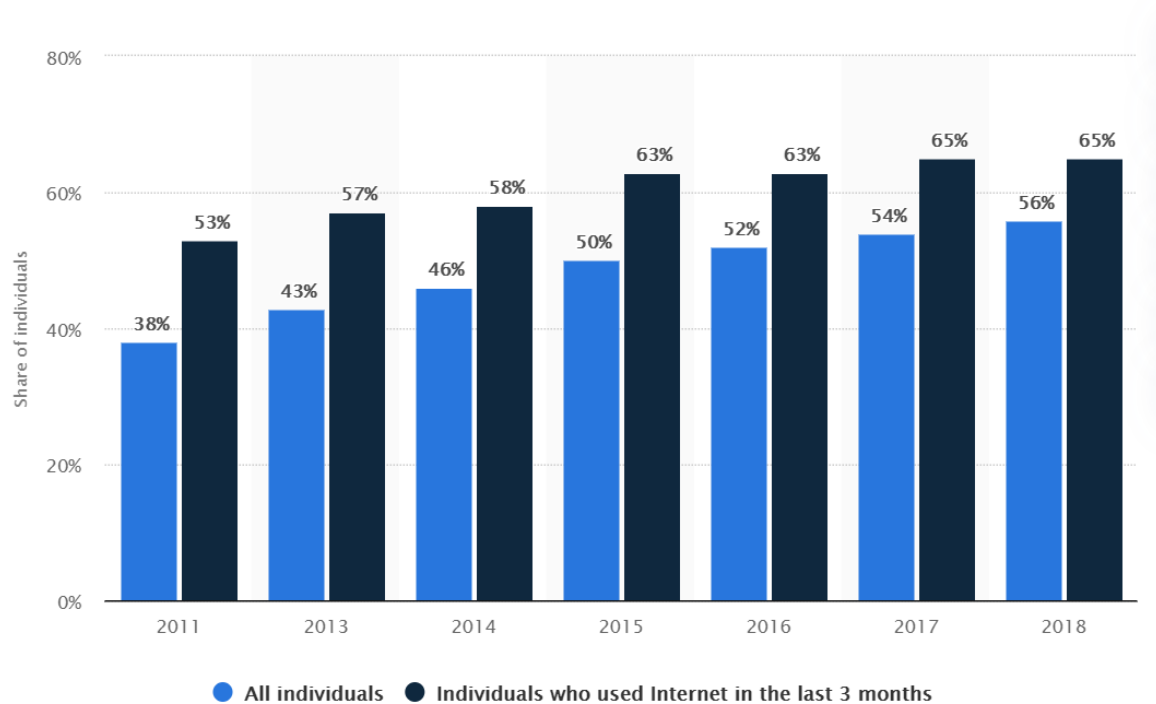
Reflect about a situation in which you have exercised your interpersonal skills (Communication, Teamwork, Empathy, and Positive Attitude) through the use of digital tools. Were you aware that these activities allowed you to exercise them?

2. Social media and smartphones

With the development of the Internet, social media have become extremely widespread and are still gaining ground. Thanks to social media, the new segments

of marketing, communication, sales, education and relationship building have been formed. Over the last 10 years, social media has practically tripled the number of its users, increasing from 970 million in 2010 to almost 3.81 billion in 2020. There are multiple different platforms, each have multiple different users and offer different possibilities.

Statistics clearly show that the use of social media in European countries has been increasing constantly over the years.



source: <https://www.statista.com/statistics/271430/social-network-penetration-in-the-eu/>

Here is a list of some of the most popular types of social media and the opportunities they offer:

Social networking (Facebook, LinkedIn) – Facebook is the most popular social media. has already collected around 2.5 milliard users. The very fact that it is the most popular social platform enables us to build relationships and reach a large number of recipients. It is also a powerful tool for building the brand image and gives us the opportunity to monitor our activities. LinkedIn is a professional social media site where industry experts share content, network with one another, and build their personal brand

Video sharing (Youtube, Vine, Facebook live) - The video portals let individuals gain hundreds of thousands of subscribers innovative ideas are awarded on these channels, allowing some to turn their hobby into a career and make money.

Microblogging (Twitter, Tumblr) - Platforms like Twitter and Tumblr can be often used outside of the blogosphere. Twitter in particular has many accounts that have

been set up by companies, organizations, media outlets, celebrities, politicians, etc. Users of both networks share different types of content (news, links, images, videos).

Social media netiquette

The prevalence of social media gives its users many opportunities for development but it is important to be aware of the risks it entails. Their universality makes proper authorisation often impossible, and you can come across so-called 'fake accounts', 'fake news' or simply scams.



In order to make the most of the potential and opportunities offered by social media, certain rules must be observed by learners, such as:

- **Being cultured**

In the social media, it is important to write and to announce opinions, which we would also announce outside the Internet - this is one of the most important principles to be observed when using the social media. Inserting false information or rude statements can damage relations with important individuals or ruin the visitor's image, because information inserted into the Internet may never be permanently removed.

- **Use of polite phrases**

Other Internet users, very often, voluntarily show courtesy by sharing their knowledge. Likewise, we communicate with them and make an effort to work together of our own free will. "Please" and "thank you" are forms of thanking people for their help.

- **Being concise**

Long and complex explanations in response to a short question statistically discourage the audience from reading it and can create confusion. It is not always possible to answer briefly and concisely, but it is important to be aware of the specifics of social media in order for a successful and effective communication and networking to take place.

- **Taking care of the grammar and spelling**

It takes a short while to make sure you don't make a mistake and it will be well received. It's all about showing respect for others, and your own image. Even the smartest statement can be perceived negatively if it contains obvious grammatical errors or typos.

- **Appropriate reference to statements made by others**

When referring to the response of another internet user, it is important to write exactly which internet user you are referring to, e.g. by his or her name or pseudonym, by a link to his or her speech or by a tag. It is then easier for other participants to follow the discussion.

- **Showing respect for members of the community**

If you do not agree with someone's statement, it should be done in a tactful and civilised way, using factual counter-arguments. Everyone is entitled to his or her own point of view on the matter, and disagreement should not be a personal attack on the author of the opinion, but an attempt to convince his or her right or to show that the problem is more complex.

- **Applying the principle of limited trust.**

Networking and establishing new connections is a very important element of the Internet environment, but learners must remember about security. You should not enter into suspicious links sent by strangers, nor should you give out your personal details about your private life.

New technologies and an constantly changing reality mean that learners still have to adapt to their environment and keep up to date with all trends. Learners need to be aware of how to comply with the rules, and of the essence of self-respect on the Internet in order to explore and best exploit the potential of the Internet and its potential for self-development.

3.Apps that boost creativity

There are many different ways in which personal development can be supported, including reading interesting guides, participating in training courses or meeting inspiring people. However, the purpose of this handbook is to show learners how to develop creative skills by using the Internet environment and applications. With the development of the Internet environment, mobile applications are also becoming increasingly common. Among them there are also many applications that can develop the interests of learners and encourage them to develop these skills by creating their own challenge based breakouts.

For this purpose, it is advisable to familiarise learners with the following applications:

Elevate – this app aims to systematically exercise our mind in several key areas: memory, estimation, counting, analysis and eloquence. First, the areas that you want to develop are selected and then you can adjust the difficulty level with a short test. Each exercise has its own time constraints, which adapt to the skills of the user.

Neuro nation - Downloaded more than 6 million times and considered one of the best applications of 2015. Neuro Nation starts with a short recognition of your needs - you choose the areas you want to develop - this allows you to adapt your training to your individual preferences. The creators of the application convince that the exercises included in the application were created in cooperation with universities from Berlin, Dortmund and The Hague. The application has many elements of gamification, i.e. engaging the user through various mechanisms of gaining points and unlocking additional levels.

Peak - As in the above examples, the user first selects which areas of development he is most interested in and takes a short test that will match the exercises to his skills. The application develops skills in five areas: intellectual fitness, concentration, memory, language skills and problem solving. The creators of Peak ensure that the best results are achieved by using the application systematically, at least three times a week.

Lumosity - Lumosity is a joint effort of scientists and game designers, the aim of which was to create a tool to help stimulate the development of our minds. This application is also aimed at being systematic. Every day, users receive a new set of exercises prepared especially for pre-selected needs, and solving them helps to develop their creativity.



Reflection activity:

Think of an problem – solving everyday activity, that boosts creativity and helps learners in developing interpersonal skills.

For more information please visit this website:

<https://project-management.com/improving-your-mobile-app-development-skills-through-personal-development/>

4. Online safety

Online safety is one of the most important concerns of modern times. Almost everything is already



in our computers and smartphones - we communicate with the world, buy, do transactions, use electronic banking, install various programs and applications. Unfortunately, there are also threats in cyberspace. It is necessary to be aware of them, and to use the Internet as safely as possible. It is estimated that worldwide losses from ICT crime will reach 2 trillion US dollars in 2019. Unfortunately, despite international campaigns to raise awareness of this type of threats, many organisations still have insufficient knowledge of the issue and do not apply appropriate safety measures.

Existing risks are constantly being replaced by new ones. Here are some of the most common ones:

DDoS attacks (distributed denial of service).

An attack on software or a website from multiple computers simultaneously to cause them to suspend or prevent them from operating online by sending too many requests. These can be prevented by using antivirus software, firewalls and filters.

Hackers

Persons responsible for external attacks trying to detect vulnerabilities in order to gain access to company systems. The purpose of such actions is to control or steal data. Regular updating of passwords and security systems is a necessary preventive measure.

Phishing and pharming.

Impersonating a trusted source (person or institution) to defraud confidential information. Phishing uses e-mail and pharming redirects to fake websites and web servers. It is essential that you tell your employees how to recognize such threats.

Bots and viruses.

Automatically installing (bots) or inadvertently installing malware (Trojans) to take control of your system or steal data. Regular updating of Internet-based data protection software and SSL certificates, installation of effective anti-virus software, and training in how to act can help prevent such threats.

Cybersecurity

Cybersecurity is the state of protecting and



recovering networks, devices and programs from any type of cyberattack. What's the best defense? Well, there is no one magic program or system that will protect you from every cyber risk. In today's connected world, everyone benefits from advanced cyberdefense programs. At an individual level, a cybersecurity attack can result in everything from identity theft, to extortion attempts, to the loss of important data like family photos. Everyone relies on critical infrastructure like power plants, hospitals, and financial service companies. Securing these and other organizations is essential to keeping our society functioning.

Everyone also benefits from the work of cyberthreat researchers, like the team of 250 threat researchers at Talos, who investigate new and emerging threats and cyber attack strategies. They reveal new vulnerabilities, educate the public on the importance of cybersecurity, and strengthen open source tools. Their work makes the Internet safer for everyone.



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