



The Global Science Opera Leverage students' participation and engagement in science through art practices

**O2 The GSO4SCHOOL
Innovation Lab Tutorial:
The Creative Process**



O2 – Innovation Lab Tutorial: The Creative Process

Project Reference:	2019-1-NO01-KA201-060170	Author(s):	Nina Østensjø, Atheno
Output and Deliverable Code:	O2, Innovation Lab Tutorial: The Creative Process	Contributors:	Oddgeir Randa Heggland, HVL Janne Robberstad, HVL
		Approved by:	HVL
Date:		Process Owner:	HVL
Short Description: Innovation Lab Tutorial: The Creative Process is an important tool to include when working with science and art inquiry. This tutorial guides you on how to work creatively with any given topic.			



CONTENTS

1. Introduction	4
2. Implementation phases	5
2.1. Feel	5
2.1.1. Key characteristics	5
2.1.2. Educators Actions.....	5
2.1.3. Students actions	6
2.1.4. Material/equipment needed	6
2.1.5. Learning outcome.....	6
2.2. Imagine	7
2.2.1. Key characteristics	7
2.2.2. Educators Actions.....	9
2.2.3. Students actions	9
2.2.4. Material/equipment needed	9
2.2.5. Learning outcome.....	10
2.3. Create	11
2.3.1. Key characteristics	11
2.3.2. Educators Actions.....	13
2.3.3. Students actions	14
2.3.4. Material/equipment needed	14
2.3.5. Learning outcome.....	15
2.4. Share	16
2.4.1. Key characteristics	16
2.4.2. Educators Actions.....	16
2.4.3. Students actions	17
2.4.4. Material/equipment needed	17
2.4.5. Learning outcome.....	17

1. Introduction

The curriculum for students changes over time. Society is developing very fast and introducing STEAM and the creative process in education may be a powerful tool to update it and make it more suited to the business and society development.

To let students learn how to conduct a creative process and lead their learning journey is part of giving them tools to manage future careers in their working lives. These, together with critical thinking, collaboration and communication, are important competences, much needed in present and future business.

When we talk to business leaders, they agree on the fact that these might be the most important competences needed of an employee.

The benefits of working with problem solving, and having tools to solve them, is that students learn how to work in teams, they learn creativity, they learn how to see a problem/ challenge and to do something about it. They develop willingness to take risks, they fail, and they try again. This will ultimately give them the confidence they need to be valuable assets both in work-, organizational- and in private life.

2. Implementation phases

Below you may find a description of the implementation phases of the tutorial following the Feel, Imagine, Create and Share approach.

2.1.



2.1.1.

Key characteristics

In a creative process there is always a challenge, a task or a problem that needs to be solved. It can be about finding new products, new ways of performing services or simply making something new like a scene in an opera.

The main reason for doing this in a process, with given “rules” and regulations, is so that all participants will get ownership to the result and that will give more engagement and loyalty to the result. It is a way of getting all participants actively engaged and make sure everyone contributes to the result.

It can be challenging to motivate all participants, but by putting them into groups and giving all the same preconditions the success rate increases.

The motivational part is key. To make sure all participants have the same information about what are we doing, why, and for what result is crucial.

2.1.2.

Educators actions

The educator must prepare for the **Feel** sequence by knowing why the creative process is an important tool in the project. The educator needs to have 100% ownership to the project and the coming process and transfer this to the participants.

He/ she will focus on information, motivation and necessary involvement of all participants both on the theme and on the practical part.

The educator will also involve external resources like mentors and motivators. Booking of necessary rooms, set up a program for the day and if equipment is needed: plan for that and/or organize it. Organizing students into groups is important to do in advance. In this process, the educator must consider the skills of each student, so the groups have the competences needed to gain the best possible outcome.

2.1.3.

Students actions

The students participating need to know what they are going to be participating in. The educator/ teacher is responsible for sharing the information, but each student needs to make sure that they know what is going to happen and make sure that they are well prepared. This is done by listening to the information, stay focused and ask questions if anything is unclear.

They must have a positive attitude and be curious. Curiosity is a great “driver” in any process.

2.1.4.

Material/equipment needed

In this part of the process there is only one equipment needed. All they need is a room large enough for all participants to sit together, and a screen to show information, pictures and/or films.

2.1.5.

Learning outcome

The curriculum for students changes over time. Society is developing very fast and introducing STEAM and the creative process in education may be a powerful tool to update it and make it more suited to the business and society development.

To let students learn how to conduct a creative process is part of giving them tools to manage future careers in their working lives. It is an important competence, much needed in present and future business. When we talk to business-leaders, they all agree on the fact that this might be one of the most important competences needed of an employee.

The benefits of working with problem solving, and having tools to solve them, is that students learn how to work in teams, they train their creativity, they learn how to see a problem/ challenge and how to do something about it. They develop willingness to take risks, they fail, and they try again.

This will ultimately give them the confidence they need to be valuable assets both in work-, organizational- and in private life.

2.2.



2.2.1.

Key characteristics

The process is starting, and the creativity needs to be “awakened”. This is the preparation to secure the best result possible.

We all have creative “muscles”, this must be trained. We have a lot of easy, simple and very effective exercises for this. The teachers will be trained to perform these exercises in advance.

The exercises will be easy to perform, requires a very limited amount of equipment and time.

Examples of the creative exercises are:

- Rip the elephant (individual)

All students get one piece of paper each (A4)

They all have to stand up, holding the paper with both hands in front of them. Then they are asked to close their eyes and to keep them closed till they are finished with the exercise.

Ask the students to tear an elephant out of the piece of paper. They can open their eyes when the task has been completed.

- The coat hanger (individually in group)

Show the students a coat hanger. Ask the question: If this wasn't a hanger, what is it then?

All students have to participate! Write down all incoming suggestions on the board for all to see.

The clue is to continue pushing suggestions even if they slow down, quantity more than quality. And the longer you push the more creative they get.

Show the students how creativity takes over, really quickly.

- Master (in pairs)

Pair the students up in groups of two.

Tell them that one of them is a master/ expert and the other one is a journalist. Ask them to take a part, and that it is not important who is what because they will switch roles and do it once more.

Then they both think of a noun. And when I count to three they say it out loud to each other.

Then they have two words, they put them together and make one word. This is what the master is an expert in and the journalist will then ask questions about it.

The work in pair for about 5 minutes, then we switch roles and do it all again with new words.

- The Airline (groups)

Divide the students into groups of approx 5. The groups will then form an airline.

The task is:

Make a salespitch (max 2 min)

Make a name

Make a logo

Make a paperplane

The group gets 30 min to prepare.

All groups pitch and show logo.

All groups throw the paperplane at the end.

Winner is best pitch.. and if doubt, the paperplane- throw decides.

- Count to 15 (groups)

The students get divided into groups of 6 students. They form a circle. The task is to count to 15.

The students will count sporadically without a “plan” of whose turn it is.. But the counting needs to be uninterrupted from 1- 15. If they interrupt each other they need to start over.

- The spoon (groups)

The students get divided into groups of 5. They get one plastic/ bamboo spoon each and a piece of clay.

The task is: create a future transport vehicle. Use the spoon and the clay for your model and prepare a salespitch (max 2 min)

The students get 20 minutes to complete the task.

- The tower (groups)

The students work in groups of 5.

They shall build a tower and the tallest standing tower wins.

They will build the tower from spaghetti and marshmallows.

The students get 5 minutes to discuss strategy. After the 5 minutes has passed, they will build the tower without talking! No talking is allowed for the 25 minutes of building.

The highest standing tower wins the contest.

Working with creativity is for many students outside the comfort-zone. Therefore, creating a safe and secure environment is important. So, preparation is key!

2.2.2.

Educators actions

Secure the environment by preparing the students.

He/ she needs to focus on and explain to the students:

- What is creativity
- Why creativity
- How creativity

Organize the creative exercises. Explain and follow them through. Make sure all students participate. The teachers will use the exercises meant for creative processes and they will be trained in advance. Make sure all students feel cared for and seen.

These exercises should be done outside of the classroom, in a room with lots of space, not too furnished. The focus needs to be on the exercises, not on the surroundings.

2.2.3.

Students actions

The students will work creatively individually and in groups. They will follow instructions from the teacher/ educator and work as freely as possible.

The exercises will serve different purposes, and this will make the students develop creatively in a direction that will free the creative mind, make them relax and open up, – prepare them for the main task ahead.

No restrictions, only possibilities and an open mind.

2.2.4.

Material/equipment needed

In the creative session there will be very little equipment needed.

As described earlier, the exercises should be done outside of the classroom, in a room with lots of space, not too furnished. The focus needs to be on the exercises, not on the surroundings.

The creative exercises:

- Rip the elephant- A4 paper; one sheet per student
- The coat hanger- a coat hanger and whiteboard/ flip-over
- Master - none
- The Airline- A4 paper; to make logo, write a sales-pitch and make a paper-plane
- Count to 15 - none
- The spoon – one plastic/ bamboo spoon and model putty
- The tower- spaghetti and marshmallows

2.2.5.

Learning outcome

Students will encounter art and cultural forms that express both people's individuality and community, and that stimulate their creativity and innovative abilities. They will also have the opportunity to use their creative abilities through various activities and forms of expression. This can provide a basis for reflection, emotion and spontaneity.

The word creativity comes from the Latin term "creare" which means "to create". According to professor of creativity, Erik Lerdahl, it is associated with "the ability to fantasize, imagine and develop new ideas". In everyday speech, the terms creativity and innovation are used interchangeably. In short, the difference is that creativity means conceiving and creating an idea, while innovation is about putting the idea into practice.

Establishing a learning arena for creativity means that it is ok and safe to "fail", at the same time as the urge to explore is valued. Within the framework of our current education system with a focus on critical and logical thinking, this is no simple task. The fear of failing and not achieving the goals of learning inhibits creative thinking for teachers, students and pupils alike.

If creativity is not considered an ambition, it will therefore be difficult for teachers to find room for such development in strict learning plans. The solution lies in the fact that it is probably necessary to work more methodically and purposefully with creativity in all subjects in the school system.

In the creative exercise- sequence we charge the creative part of the brain. The students will open up and free their minds, prepare themselves to work creatively to solve an assignment/ a task or a problem. These are skills they will be able to use in various situations and tasks. Not only for the creative process.

2.3.



2.3.1.

Key characteristics

The next step is to formalize creativity in a professional context, the assignment or the project. In meetings with pupils and students, we can, for example, conclude that a good (read: creative) work process can be to:

- see many solution suggestions
- dare take chances
- put together known knowledge in a new way
- challenge an established truth

This is to know something about what is being considered in the process. The prerequisite is that the participants have been introduced to methods and tools for developing ideas.

This part of the process is all about finding an answer to a problem or a solution to a challenge.

At the end of the process we have something to work with, an answer.

The students get an assignment. The assignment will be solved in groups, max 5 students per group.

To find solutions to problems, challenges, new products, new services etc. there are different ways to go about it.

The creative process normally consists of three phases:

- The dream room
- The critics room
- The realization room

The dream room: The creative process starts with us entering a room where it is only allowed to dream. Here we dream up the most amazing ideas. It is absolutely forbidden to criticize, and no restrictions apply. We have to “close” the door before we can move to the next room.

The critics room: In this room we can think of limitations, costs, technology and lack of knowledge. In this room, we will weigh the pros against the cons. If we are not happy with the result, we must start again in the dream room.

The realization room: Here we will - as far as possible - talk about how we can realize the idea. We will try to break down the work process into smaller, more affordable work tasks, which brings us one step closer to realization. Furthermore, we will focus on which people can help us in the realization, and all aspects of reaching our goals.

Brainstorming (in groups)

Brainstorming is most prevalent in the classroom. The process involves a group working together. Like all creative approaches, it has both advantages and disadvantages. This tactic works best with simple problems to be solved and that everyone in the group has prepared by gathering relevant information. The advantage is that it is flexible to implement in relation to time and aids. The downside is that ideas can become superficial and impersonal. The more shy or introverted will probably prefer the way of working in Brainwriting or Automatic writing that is reminiscent of brainstorming, but the brainstorming takes place in writing and can be done individually, anonymously or in groups.

Procedure:

- Each participant must have their own Post-it book. Write down each of your ideas on the note - without collaborating.
- Everyone in the group puts the Post-it notes in the center of the table. Be inspired by the ideas of others. Maybe this will lead you to come up with new ideas.
- As soon as this is done, you start a new round. If not, everyone can move on with more than one idea, that's fine.
- Keep creating ideas until it starts to slow down.
- It's time to summarize: What ideas have you come up with?

Important:

- Hang the ideas on a board or wall.
- Write down all ideas (not final solutions) Quantity not QUALITY
- The post-it notes can be moved around – to create associations.

- Only when the walls are full of ideas can you process them further into solutions.

2.3.2.

Educators actions

Prior to the creative process, the students must have a general introduction to the topic/ theme (for instance **energy**). It is important that the students have a certain basic knowledge regarding motivation and participation in the work that will be done, and of course for the results.

The students get an assignment. The assignment will be solved in groups, max 5 students per group. To find solutions to problems, challenges, new products, new services etc. there are different ways to go about it.

Example of how the days can look like for the participating class:

Day 1:

08:30- 09:00 Joint start-up for all students together

In this sequence we gather all the participating students and kick off the project. We inform about the project and motivate for maximum effort and result. We also talk about all aspects of the work ahead, all the steps and what they need to have at the end. We also talk about the importance of the presentation/ pitch of the result or final idea.

09:00- 10:00 Creative exercises

In the creative exercise- sequence we charge the creative part of the brain. We have 2- 3 exercises to get the creativity going.

10:00- 10:15 Break

10:15- 11:00 Divide into groups and disclosure of the assignment

It is always good to keep the groups secret until this part of the program. We always encourage teachers to divide the student into groups based on competence and skills, not considering the friendships-factor. The more different they are, the better for the process and the result.

The assignment also needs to be secret until this point. That will give them the same starting point and it also creates an exciting highlight feeling.

The task is divided into three parts; find a solution, make a physical model of the solution and make a sales-pitch/ presentation

11:00- 11:30 Lunch

To have a meal together is a good idea. Make the lunch-break special by adding something extra. This motivates and lifts their spirits.

To give the students fruit and chocolate is also great. They get happy and their blood sugar rises.

It can be a positive addition to the process to have mentors visiting the groups at some point after lunch day 1.

11:30- 14:00 The students continue to work with the assignment in groups

They will try to finish as much as possible. Preferable have an idea to “polish” day 2.

Day 2:

08:30- 12:00 The students finish the project and practice the presentation

12:00- 14:00 Presentation/ pitch and selection of a winning group

The group will pitch in front of a panel/ jury. The panel/ jury will pick the best idea(s)

The physical model

When it comes to material for the models they are going to make, it is common for the students to collect and bring equipment with them from home. This should be a homework assignment about 2 weeks before completion of the process.

2.3.3.

Students actions

Look above

2.3.4.

Material/equipment needed

The physical model

Equipment that is easy to collect:

- Empty cardboard boxes
- Toilet- rollers, drying paper- rollers
- Yarn Remains
- Aluminum foil
- All types of paper
- Wire
- Electrical wires
- Battery

There are no restrictions on what equipment and materials they can use. The school may have its own restrictions if they require it.

The students will need paper to write and/ or draw on.

Post-it notebooks

Pens/ crayons

In addition to this you will need physical space. A room that can gather all participants, maybe an auditorium. And group rooms for all the groups, or space for the groups.

It is also good if there is a projector if the educator or the motivator want to show a PowerPoint and/or a film.

2.3.5.

Learning outcome

In the creative exercise- sequence, we charge the creative part of the brain. The students will open up and free their minds, prepare themselves to work creatively to solve an assignment/ a task or a problem.

These are skills they will be able to use in various situations and tasks. Not only for the creative process.

The most important learning is that they learn how to take a challenge from a problem and turn it into a solution.

2.4.



2.4.1.

Key characteristics

The sharing is the last part of the process. This is when the students show/ perform the result of the process.

Sharing the creative learning-process through a pitch or presentation, may help the students in several ways.

The process of finding what to present and how, the students automatically evaluate their work, what is essential to present in “selling the idea”, and what is not. It helps them focus on their final solution to the challenge and works as a repetition of what they have learned.

It may also help the students in training of their physical “performing-in-public”-skills. For some students this might be scary, which is why it is important to encourage them in making a good plan to follow. Giving the students time to rehearse the presentation before performing for an audience, may increase their chances of a successful dissemination, and thereby their own positive feelings.

If the final solution to the challenge is to be presented in the international GSO4SCHOOL network, it will need to be filmed and/or presented online. This in turn will require some additional aspects to the project:

- Filming and editing
- Providing a short oral presentation and including sub-titles in English on the film.
- Consider a creative, untraditional end-presentation. Can it be sung? Can it be rapped? Can it be made into a stop-motion film?

2.4.2.

Educators actions

The educator is still the facilitator. He /she will facilitate the sharing in accordance with the planned and agreed manner in the project.

He/she needs to decide to what degree it is a competition with a jury and a prize for the winning team. This jury could be the students' parents, or another class. It could also be a local corporation who are looking for new and innovative ideas. Having a "real" client for the assignment might increase the effort quite a bit on the students' part, and it may inspire them to continue in this effort.

2.4.3.

Students actions

The students will perform and present the project/ result / outcome for a given audience. It might be a "jury" who will decide which group has the best idea/ solution. They will be competing to have the best idea/solution. The winning group will have the solution for all participants.

2.4.4.

Material/equipment needed

- We need an arena for presentation (an auditorium?)
- Projector
- Sound (both microphones and loudspeaker)
- PC/MAC
- Rewards for the winning group if you choose to have a competition (a small reward like chocolate medals)

2.4.5.

Learning outcome

By sharing their knowledge, the students are creative while they practice their skills in visual and oral presentations. By giving and receiving feedback, the students will learn more about working together as a team, in addition to increase their critical thinking skills.

When the students are finished sharing their work, it is important to self-evaluate and reflect upon the process.