Training Fiche

Title	**Creativity**
Keywords	Creativity, components of creativity, 4P creativity model, team creativity, creativity techniques, design thinking
Provided by	UNIDU
Language	English
Objectives	The unit entitled Creativity looks at definitions of creativity, identifies its components, introduces the 4P model of creativity and outlines the types of creativity. It also looks at creativity in teams and provides an overview of selected creativity techniques. Finally, it addresses design thinking framework.
Learning outcomes	At the end of this module you will be able to: 1. Define creativity, outline its importance and identify its components 2. Explain the 4P model of creativity and discuss the types of creativity 3. Understand how to build creative teams 4. Define, explain and apply the most commonly used creativity techniques 5. Explain the framework of design thinking
Training Area	Creativity
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Content development

1. Creativity

1.1. Defining creativity

1.1.1. What is creativity? The importance of creativity

Creativity is a term that has become very popular in recent decades. Creativity is the key to success in almost all aspects of life, personal and professional. Being creative is a necessity in today's rapidly changing and challenging world. In addition, creativity is one of the most important qualities that every employer wants when hiring an employee. Creativity is important to society and it exerts a powerful influence on all aspects of society. It changes culture, knowledge, communication, leisure - and production and consumption (Westlund, Andersson and Karlsson, 2014).

There are countless definitions of creativity and it is difficult to settle on a single one. There is no clear consensus on how to define creativity. However, Helfand et al. (2017) state that there is a broad consensus on the definition of creativity, with most researchers agreeing that creativity is the combination of two core elements:
(1) novelty, newness, or originality, and
(2) task appropriateness, usefulness, or meaningfulness.

Similarly, Kaufman and Sternberg (2010) note that creativity involves the production by individuals of ideas that are novel, surprising, and compelling. Sternberg (2019) highlights that the most important variable in creativity is the willingness to think in novel, surprising, and persuasive ways.

The Cambridge Dictionary defines creativity as "the ability to produce or use original and unusual ideas", while the Merriam-Webster Dictionary defines the term as "the ability to create" and "the quality of being creative".

Sternberg and Lubart (1999, p. 3) define creativity as "*the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints)*".

According to Rothenberg (1990, p. 5), "*creativity is the production of something that is both new and truly valuable*". In this sense, creativity consists of:
(a) being open and flexible and arriving at useful or new solutions to work or life problems,
(b) recognizing and expressing the uniqueness of one's personality, style, goals, and ways of interacting with others, and
(c) the ability to grow and change in relation to internal goals and external reality. Finally, Rothenberg acknowledges that creativity is present in everyone regardless of definition.

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Chaudhary (2018, p. 171) asserts that "*creativity is the process of developing an original, novel, yet appropriate response to a problem*". In this context, an original response refers to a response that is not normally given; novel is a response that is new or has no precedent, while an appropriate response is one that is deemed appropriate in the given situation.

Sternberg and Lubart (1991, 1992) have proposed the *Investment Theory of Creativity*, which states that creativity is in large part a decision. Specifically, it is a decision to buy low and sell high in the world of ideas. Creative people, like good investors, develop ideas that are considered novel and perhaps even a little ridiculous at the time. Creatives, figuratively speaking, "buy low." Once their ideas have gained some acceptance, creatives "sell high," reap the profits from their good idea, and move on to the next unpopular idea.

Sternberg and Lubart (1999) point out that creativity is important at both the individual and societal levels. At an individual level, creativity is relevant when it comes to solving problems at work and in daily life. At the societal level, creativity can lead to new scientific knowledge, new movements in the arts, new inventions, and social programs. The economic importance of creativity is obvious, because new products and services create jobs.

Creativity is the act of turning new and imaginative ideas into reality. It is characterised by the ability to perceive the world in new ways, to find hidden patterns, to make connections between seemingly unrelated phenomena, and to develop solutions. Creativity involves two processes: thinking and then producing (https://www.creativityatwork.com/what-is-creativity/).

Moreover, to be creative, one should develop ideas that have high potential effectiveness in the field that interests one, and the potential can be transformed into a success or an inadequacy, depending on the sociocultural conditions. Creativity requires potential originality, a basic requirement that includes novelty, authenticity and surprise (Corazza et al., 2021).

In general, there are two main components of creativity:

- *Originality* – novelty and uniqueness of the idea or method
- *Functionality* - a creative idea must work and produce results.

Creative work requires the application and balance of three abilities, all of which can be developed (Sternberg and Williams, 1996):

- *Synthetic ability* - the ability to generate new and

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interesting ideas or creativity,
- *Analytical ability* - the ability to think critically,
- *Practical ability* - the ability to put theory into practice and turn abstract ideas into practical achievements.

In each individual, creativity is a function of several components. According to Sternberg and Lubart (1992), there are five components of creativity:

(1) *Expertise* - a well-developed knowledge base that provides the ideas, images, and expressions,
(2) *Imaginative thinking skills* - the ability to see things in new ways, recognize patterns, and make connections,
(3) *A venturesome personality* - seeks out new experiences, tolerates ambiguity and risk, and persistently overcomes obstacles,
(4) *Intrinsic motivation* - the quality of being driven by interest, satisfaction, and challenge,
(5) *Creative environment* - an innovative/interactive environment stimulates, supports and refines creative ideas.

Sternberg and Lubart (1995) suggest that the person capable of creative production must possess several resources, some of which are as follows:

1. *A set of intellectual skills*, three of which are particularly important: the ability to see problems in new ways and to go beyond ordinary ideas; the ability to identify which ideas are worth pursuing; and the ability to convince others of the value of one's ideas
2. *Knowledge of the field*, although too much knowledge can hinder the generation of new ideas
3. *A personality* that allows you to think independently, which is necessary if you are going to buck the crowd and advocate ideas that most others disagree with
4. *An environment* that supports and rewards creative ideas.

According to Cloninger and Mengert (2010), creative people are characterised by the following traits:

- *Cognitive characteristics* (metaphorical thinking, flexibility in skill and decision-making, independence in judgement, coping well with novelty, logical thinking skills, visualization, finding order in chaos, escaping entrenchment),
- *Personality characteristics* (willingness to take risks, i.e. novelty-seeking, perseverance, drive, commitment, curiosity, openness to experience, tolerance for ambiguity, broad interests, valuing originality, intuition and deep emotions, introspective),

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- *Domain-related characteristics* (e.g. young writers - playfulness with words, high conceptual verbal intelligence, early readers, use of figures of speech: metaphorical/rhetorical ability, ear for sound of language, non-conforming and like to be alone, value self-expression, productive, driven and can take rejection, like to work alone).

1.1.2 Components of creativity and the 4P model of creativity

As Rhodes (1961) stated, creativity describes a phenomenon in which an individual uses implicit cognitive thinking to develop new products and where an environment is present that fosters this creation.

His 4P categorization is the most recognised and one of the first to state that creativity is an interaction of four aspects: (1) ***P**erson*, (2) ***P**rocess*, (3) ***P**roduct*, and (4) the ***P**ress*.

Consequently, the 4P model of creativity developed by Rhodes (1961) refers to:

(1) the creative ***person*** – including cognitive abilities, personality characteristics, habits, attitudes, value systems, and behaviour
(2) creative ***processes*** or the methodology that produces a creative product,
(3) creative ***products*** that are unique, novel, and useful ideas,
(4) ***press*** (sometimes referred to as ***place***), which refers to the environment.

1.1.3 Types of creativity

Dietrich (2004) examined creativity from the perspective of brain and neuroscience and identified four types of creativity with corresponding brain activities:

(1) Deliberate and cognitive creativity
(2) Deliberate and emotional creativity
(3) Spontaneous and cognitive creativity
(4) Spontaneous and emotional creativity

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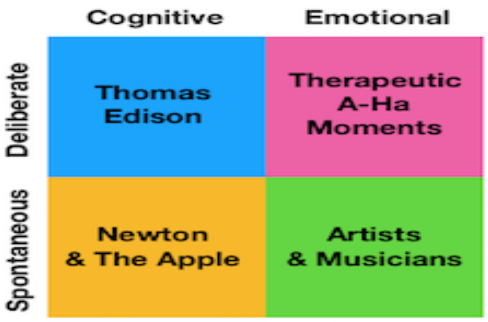

In other words, creativity can be either emotionally or cognitively based, and it can be spontaneous or conscious. This gives the four quadrants.

(1) *Deliberate and cognitive creativity*
For deliberate, cognitive creativity, one must have pre-existing knowledge on a particular subject or subjects. When you are consciously and cognitively creative, you put together existing information in new and novel ways. Deliberate and cognitive creativity requires a high level of knowledge and a lot of time. Thomas Edison, the inventor of the electric light bulb, was a deliberate and cognitive creator.

(2) *Deliberate and emotional creativity*
People who engage in deliberate, emotional creativity have a-ha moments having to do with feelings and emotions. Deliberate and emotional creativity requires quiet time.

(3) *Spontaneous and cognitive creativity*
This type of creativity requires an existing body of knowledge. It requires stopping work on the problem and stepping away. The story of Isaac Newton discovering gravity while watching a falling apple is an example of spontaneous and cognitive creativity.

(4) *Spontaneous and emotional creativity*
This is the kind of creativity possessed by great artists and musicians. This kind of creativity does not require specific knowledge (since it is not cognitive), but often requires skill (written, artistic, musical) to create something from the spontaneous and emotional creative idea.

1.2. Team creativity and creativity techniques

1.2.1. Overcoming personal barriers to creativity

In the ideal R&D organization, appropriate ideas are welcomed, assessed, and implemented. Self-respect and mutual respect

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flourish, and employees often increase their self-awareness, self-acceptance, and self-esteem. Under these conditions, individuals and the organization can reach their potential.

Creative individuals and organisations will establish the structure in which:

- Group operates to capacity;
- People tell the truth;
- Individuals take responsibility for their behaviour and feelings.

Individuals can maximize their creative potential by overcoming psychological blocks that can occur at any stage of the creative process. Very often, these blocks stem from our insecurity, which distorts our creative and intellectual abilities as it leads us to try to avoid being ignored, humiliated, or rejected. (Schutz, 1995).

According to Schutz (1995), in order to remove obstacles to creativity and logical thinking, obstacles must be identified at each stage of the creative process.

Stage 1: Experience
Before you come up with a creative solution, you need to acquire a repertoire of experience. Blocks to acquiring experience are:

- Fear of not learning;
- Fear of violating standards.

Stage 2: Association
You should be able to associate experiences into a useful product. The blocks to making associations are:

- Overvaluing rationality;
- Fear of self-awareness.

Stage 3: Expression
You should be able to express his/her idea. The obstacles to expression are:

- Fear of embarrassment;
- Fear of assertion.

Stage 4: Evaluation
You must be able to distinguish the creative from be, the productive from the irrelevant. Obstacles to evaluation are:

- Fear of humiliation;
- Fear of rejection.

Stage 5: Perseverance
The concept of continuous improvement states that any process or product should be endlessly revised and improved. Perseverance blocks include:

- Fear of failure;

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- Lack of rewards.

In addition, Schultz (1995) lists the following questions that can help you assess your strengths and limitations of creativity.

1. Which blocks sounds familiar to you for each stage of the creative process? Which do you want to remove?
2. Do you have any blocks to acquiring knowledge? Do you fear that you won't remember information? Are you reluctant to explore certain personal areas?
3. Have you developed the ability to make creative associations? Are you reluctant to let your mind go wherever it wants? If so, why?
4. Are you inhibited in writing or speaking? Are you afraid of making yourself look foolish?
5. Do you trust yourself to judge your creative efforts?
6. Do you have trouble to sticking with things until they are complete? Are you afraid of failure or being disappointed When you complete something? Why?

"The key to dissolving blocks to creativity lies in the kind of self-esteem that thrives in an open, truthful organization, where everyone can express their concerns openly and their humanity will be accepted. When we can focus on problems rather than defences, and when we all feel safe to acknowledge our fears, the organization becomes a community that helps each person to identify and remove these blocks— and experience soaring creativity."(Schutz, 1995).

1.2.2. Team creativity

Creativity is essential to organisations, and creative work is often done in teams. Team creativity can be defined as the joint novelty and usefulness of a final idea developed by a group of people. 60% of CEOs said that creativity is the most important leadership quality. So the question is: How can we foster creativity in the workplace? Regardless of the size of your organization, here are four ways to encourage creative spark and idea sharing in the workplace (https://blog.flock.com/4-proven-ways-to-encourage-team-creativity):

1. Promote workplace flexibility

A good way to boost the creativity is to provide employees free time to think about strategies and ideas. Leaders who tend to micromanage may actually supress productivity and employee engagement by limiting the potential for creative thinking.

2. Introduce a collaboration app

Project collaboration apps can enhance the kind of open communication that supports innovation, design thinking, and

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disruptive innovation.

3. Adopt design thinking

Design thinking is a method of customer-focused product design driven by diverse teams of people from different backgrounds. When everyone's feedback is valued, people are more likely to share ideas with more creative outcomes.

4. Recognize creative success

The organizations with the most-engaged employees share a commitment to positivity. Rewarding employees and recognizing team members who share great ideas can incentivize future innovation.

1.2.3. Creativity in the workplace

Creativity in the workplace can be defined as taking risks- taking you and your team out of your comfort zone, and into the unknown. Creativity in your workplace is one of the most important steps on the road to success. Finding a way to apply in your workplace will unleash new, fresh and innovative ideas (https://engageinlearning.com/blog/why-is-creativity-important-in-the-workplace/).

Fundamentals for creative thinking are:

- Analysis - analysing the current order of things forms the basis for creative thinking.
- Open-mindedness - be open to making mistakes and hitting dead ends before making a breakthrough.
- Organisation – the ability to structure a thought and turn it into a plan with a process, a goal and a deadline is essential.
- Communication – great ideas are only useful if they can be communicated to others (written, verbal and listening skills).
- Training – which encourages and develops creative thinking and problem solving skills.

The benefits of fostering creativity in the workplace include (https://visitjeromeidaho.com/2019/03/why-is-creativity-important-in-the-workplace/):

Creativity Builds Better Teamwork

- Creativity inspires employees to work with each other, and the creative process encourages collaboration.
- Many unique ideas come from just one person, but they are shaped by a team to develop to their full potential.

Creativity Improves the Ability to Attract and Retain Employees

- Employees are more satisfied with their jobs and remain loyal to the company.

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Creativity Increases Problem-Solving

- With the ability to think creatively and think outside the box, employees are more likely to find unique and innovative solutions to obstacles they face.

1.2.4. Creativity Techniques

Creativity training programmes typically focus on idea generation and cognitive processing activities to develop creative problem-solving skills. Creativity techniques are an important element in developing these skills.

There is no single definition of creativity techniques, but here are a few:

- „Specific sessions to facilitate the creative process by providing strategies and heuristics to develop new ideas" (Herrmann and Felfe, 2014; Meinel and Voigt, 2017, Wöhler and Reinhardt, 2021).
- Creativity Techniques are tools to "awaken and strengthen the creative potential of individuals" (Leopoldino et al., 2016, p. 95).

Creativity techniques are applied in many stages of the innovation process, particularly in the idea generation stage (Meinel and Voigt, 2017).

According to Geschka (1983) and adopted by Wöhler and Reinhardt (2021), there are two dimensions of creativity techniques: the first is the way ideas are generated and the second is mechanism of idea triggering.

Two dimensions:

1. Idea generation by:
    - stimulating intuition
    - using a systematic problem-solving approach.
2. Idea triggering mechanism:
    - Ideas can either be the result of variation and development of existing ideas
    - Ideas can be triggered by confrontation with events, objects or thoughts that are independent of the problem at hand.

Based on these two dimensions, Wöhler and Reinhardt (2021) list four categories of creativity techniques and categorise eleven creativity techniques (Table 1):

- intuitive association (IA),
- intuitive confrontation (IC),
- systematic variation (SV)
- systematic confrontation (SC).

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Table 1. Classification of creativity techniques

	Idea Triggering Mechanism	
	Variation	**Confrontation**
	Methods of Intuitive Association (IA)	**Methods of Intuitive Confrontation (IC)**
Stimulation of Intuition	• Brainstorming • Brainwriting • Speed-Dating	• Stimulating Word Analysis • Semantic Intuition • Provocation
	Methods of Systematic Variation (SV)	**Methods of Systematic Confrontation (SC).**
Systematic-Analytical Concept	• Morphological Tableau • Programming	• Six Thinking Hats • TRIZ • TILMAG

Source: Wöhler at al. (2021)

Leopoldino et al. (2016) conducted an analysis of previous research on this topic and propose the most frequently cited techniques. Among the techniques in Table 1, brainstorming and brainwriting are the dominant techniques, followed by the six thinking hats and TRIZ.

Brainstorming

Brainstorming - any group session aimed at gathering a set of ideas to solve a particular problem. This process creates an environment where individuals work together and the whole group makes decisions, not just one individual. In brainstorming, there are no limits to the creativity for suggestions. The result of brainstorming is a list of ideas freely contributed by all group members.

According to Litcanu et al. (2015, p. 388) “brainstorming is both a method of study and learning, and a method of scientific inquiry and creativity”.

Brainwriting

A technique very similar to brainstorming, but relatively unknown. It can further develop ideas generated during brainstorming.

Liticanu et al. (2015) suggest some advantages over brainstorming:

- Putting your ideas in writing, rather than just saying them, helps you think them through and articulate them more clearly;
- It can also help shy participants to express themselves.
- It is beneficial if the group tends to "socialise" too much;
- Compared to brainstorming, brainwriting tends to result in slightly fewer, but better developed ideas (Roco, 2004).

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The six thinking hats metaphor

The technique of the six thinking hats assumes six different cognitive approaches to critical thinking. The six hats are coloured differently and each one represents a different approach to the problem.

- The colours are:
  - Yellow – Benefits, Positive aspects, Brightness and optimism
  - Black – Difficulties, Negative aspects, Caution and criticalness
  - Blue – Process, Organisational thinking: recap, next steps…
  - Green – Creativity, new ideas, alternatives
  - Red – Emotions, intuition, instinct and hunches
  - White – Facts, data, rationality

1.3 Design Thinking

1.3.1. Design thinking framework

Design thinking is a process that is regularly used by designers, but has recently been rapidly spreading among organisations as a means of fostering innovation through creative problem-solving processes. Entrepreneurs can use design thinking, i.e. reflection, alternatives, visualisation, creative problem solving, to identify unique business opportunities.

In design thinking, failure and difficulties are not seen as a threat, but as an opportunity to continue learning, as they stimulate individuals to develop innovative ideas and solutions. It is important to remember that these new ideas and solutions must be feasible, practical and desired by people.

There is not yet a universally accepted definition of design thinking. However, the framework proposed by Carlgren et al. (2016) includes five main themes that describe design thinking:

- User Focus,
- Problem Framing,
- Diversity,
- Experimentation
- Visualization.

User focus

This aspect of design thinking focuses on users and on solutions that meet the needs of customers. Empathy, combined with a willingness to understand and consider the customer's needs, plays a critical role in developing tailored solutions.

Problem Framing

Design thinkers challenge the traditional way of thinking about

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	and solving problems. Rather than attempting to solve the problem by deduction or induction, design thinkers repeatedly question and reformulate the original problem to identify a larger problem and multiple alternative solutions. Failure is not seen as a bad thing; on the contrary, it is seen as an opportunity to learn. ***Diversity*** Diversity of viewpoints on a given problem leads to creative solutions by combining different ideas from different people. This diversity can be achieved through a diverse team where different personalities and skills come together. ***Experimentation*** Diversity and specific problem framing require trying out solutions and testing different ways of doing things. In practice, this testing and trying is based on experimentation, which in turn reveals new possibilities. Once again, failure is not a threat, but an opportunity to learn. ***Visualisation*** Visualisation makes ideas more tangible and allows one to understand abstract concepts and grasp all the facets hidden in the ambiguity of words alone. **1.3.2. Design Thinking models** Dell'Era et al. (2018, p. 329) analysed previous research and listed four types of design thinking based on the collected data: • ***Creative Problem Solving:*** Solving wicked problems by adopting both analytical and intuitive thinking • ***Sprint Execution:*** Delivering and testing viable products to learn from customers and improve the solution • ***Creative Confidence***: Engaging people to give them more confidence in creative processes • ***Innovation of Meaning:*** Envisioning new directions that aim at proposing meaningful experiences to people.
Glossary	**Creativity** According to Sternberg and Lubart (1999, p. 3), creativity is "*the ability to produce work that is both novel (i.e., original, unexpected) and appropriate (i.e., useful, adaptive concerning task constraints)*". **Investment Theory of Creativity** The Investment Theory of Creativity states that creativity is in large part a decision. Creative people, like good investors, develop ideas that are considered novel and perhaps even a little ridiculous at the time, i.e., they "buy low." Once their ideas have gained some acceptance, creatives "sell high," reap the profits from their good idea, and move on to the next unpopular idea.

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	The 4P model of creativity The 4P model of creativity refers to the creative person, creative processes, creative products, and press (sometimes referred to as place). **Team creativity** Team creativity can be defined as the joint novelty and usefulness of a final idea developed by a group of people. **Creativity Techniques** Creativity techniques are a tool used to awake and nurture the creative potential of individuals and teams. **Design Thinking** A process typically used by designers but recently inspiring entrepreneurs in their decision-making. Entrepreneurs use reflection, alternatives, visualisation, empathy and creative problem solving to identify unique business opportunities.
Self-evaluation (multiple choice queries and answers)	1. Which of the following is not one of the components of creativity? a) A venturesome personality b) Imaginative thinking skills c) A creative environment d) Visualization e) Intrinsic motivation 2. Which type of creativity requires a great amount of knowledge about a particular subject and a lot of time? a) Deliberate and cognitive creativity b) Deliberate and emotional creativity c) Spontaneous and cognitive creativity d) Spontaneous and emotional creativity 3. According to the Investment Theory of Creativity, creativity is in large part: a) A curiosity b) Self-expression c) A decision d) Tolerance e) Perseverance 4. Individual can maximize creative potential: a) by overcoming psychological blocks that can arise at each stage of creative process b) by developing creative thinking and problem solving skills. c) By evaluating the obstacles d) By rewarding employees 5. Creativity in the workplace can be defined as: a) taking risks b) evaluating opportunities

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	c) recognizing creative success d) fear of humiliation 6. Creativity techniques are most commonly focused on: a) profits b) taking risk c) idea generation d) reducing costs and revenues 7. Brainstorming and brainwriting are: a) processes in which one individual makes a list of ideas b) processes that can create a competitive environment to promote new and creative ideas c) processes in which team members do not mater d) all of the above e) none of the above 8. During six hats thinking process, Pero said: "Sail is falling, product will lose its market, firm will bankrupt". He is wearing: a) yellow hat b) blue hat c) green hat d) black hat 9. What is the first step in the process of Design Thinking a) Visualise b) Experiment c) Empathise d) None of the above 10. Which kind of design thinking engage people to make them more confident with creative processes a) Creative problem solving b) Sprint execution c) Creative confidence d) Innovation of Meaning Answers: 1d, 2a, 3c, 4a, 5a, 6c, 7b, 8d, 9c, 10c
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Resources (videos, reference link)	**PPT Creativity** **Best Practices: Valamar, Kras, SSE** **Case study for Creativity no. 1, 2, 3** **Reference link:** 1. http://www.robertjsternberg.com/investment-theory-of-creativity (Access 2021 11 04). 2. https://www.linkedin.com/pulse/4-types-creativity-maryam-al-balooshi (Access 2021 11 04). 3. https://www.merriam-webster.com/dictionary/creativity (Access 2021 11 04). 4. https://dictionary.cambridge.org/dictionary/english/creativity (Access 2021 11 04). 5. https://www.creativityatwork.com/what-is-creativity/ (Access 2021 11 04). 6. https://visitjeromeidaho.com/2019/03/why-is-creativity-important-in-the-workplace/ (Access 2021 11 04). 7. https://engageinlearning.com/blog/why-is-creativity-important-in-the-workplace/ (Access 2021 11 04). 8. https://blog.flock.com/4-proven-ways-to-encourage-team-creativity (Access 2021 11 04).

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