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(eds.)

Creative Learning for Entrepreneurship



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CREATIVE LEARNING FOR ENTREPRENEURSHIP

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BEYOND THE LIMITS
Developing Entrepreneurship via Creativity in Schools

Foreword

Professor Osman Titrek,

Project Director, Erasmus+ Ka203, 'Beyond the Limits' project.

This e-book is a product from the Erasmus+ Strategic partnership Ka 203 project, 'Beyond the Limits: Developing Entrepreneurship via Creativity in Schools.

This project aimed to develop learners' skills in creativity and entrepreneurship at upper school and university levels. The project brought together a partnership of eight universities and institutes from seven countries across Europe, led by Sakarya University in Türkiye. The project was initiated in 2019 and approved by the European Union to commence in 2020. The COVID19 pandemic caused lockdown across Europe, and in consequence the organisation of the project was by virtual means during the first year.

The leaders of the national partners brought together highly eminent and experienced researchers, innovators and educators from their countries. A preliminary needs analysis by project partners from several European countries indicated the lack of comprehensive teaching and learning material about creativity and entrepreneurship which is available to everyone by open access. During the project, we assessed the entrepreneurship and creativity levels of students, and aimed to develop university students' and teachers' creativity and entrepreneurial competences via education programs. The project aimed to encourage schools to place greater importance on entrepreneurship education and on organizing entrepreneurship activities to motivate young people to develop their potential, with competence development planned according to the specific needs of the age groups of students. It aimed to develop understanding and connectivity of the relationships between creativity and entrepreneurship, in education and in practice.

The project included presentations of work at the International Conference on Lifelong Education and Leadership for ALL in 2021, 2022 and 2023. There were two Intensive Programmes for learners from the partner institutions, which included one week on-line and one week in person. These took place in Sakarya in January and Liepaja, Latvia in September 2022. These facilitated multi-cultural and multi-disciplinary curricular approaches, both online and through live participation by groups of around 50-60 students and academics in innovative learning and cultural exchange activities. They promoted students' development of entrepreneurship competences through experiential creative

and innovative methods, practices and techniques, applied within a 'learning by doing' and technology-enabled context.

The main aim of this e-book as an intellectual output is to create a resource of comprehensive, high quality academic material which can be used by institutions and educators to develop creativity and entrepreneurship skills of students and young people at different levels. The audience for this book is university students, young people, teachers, teacher trainers and academicians. Educators are encouraged to benefit from the e-book in their teaching, scholarship and their research activities.

The e-book offers an intellectual and practical resource, supported by extensive prior literature, for academicians and researchers who wish to study or conduct educational research about creativity and entrepreneurship. Also, they will find many activities and applications which they can use in their learning design and educational practice, for the classroom and beyond in their higher education institutions. The e-book, developed by the project partners as authors, is innovative in the sense that it includes both academic literature for creativity and entrepreneurship, and it also includes practical applications for classroom and everyday learning activities to develop the skills of young people. The anticipated impact of this e-book is to provide new understanding and an extensive knowledge of creativity and entrepreneurship which is readily accessible by students, teachers, trainers and academicians from different European countries, and beyond. The e-book is intended for universal and free open access. This supports our vision is for creativity and entrepreneurship to be open to learners both in Europe, and worldwide.

With this book, researchers and those interested in entrepreneurship have the opportunity to access important academic knowledge and knowledge-based practices and perspectives across all the countries of Europe, and ultimately worldwide.

Sincerely,

Professor Osman Titrek,
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Introduction

What is this book, and who is it for?

There are many books on entrepreneurship, creativity and related education and learning. This book makes new and useful contributions in these fields, which can help readers to look optimistically and resourcefully towards our world which is full of both challenges and opportunities to address them.

Who is this book for? It is written for anyone with an interest in creativity, entrepreneurship, education and learning, and how these topics interconnect. You may be an educator, a trainee teacher, a learner, a researcher, or a general reader. You may work in enterprise and small business support or community development. It is intended primarily for use in education at advanced and higher education levels.

Whatever your background, please browse and explore the book to find what may be interesting or useful for you.

The book provides fresh and usable insights for readers and educators to use, exploring theoretical, conceptual, educational and practical interconnections between creativity, entrepreneurship, and education. It aims to be accessible and engaging, with a focus on conceptual, imaginal and practical applications. It connects with related themes and issues of European, international and cross-boundary thinking, sustainability, diversity and inclusion, digital and open creativity, socially responsible and ethical entrepreneurship.

Who has written this book?

The book was written as an integral part of the European Erasmus Plus-funded project called 'Beyond the Limits – Developing Entrepreneurship via Creativity' which ran between 2020 and 2023. This project created new activities, initiatives, insights and materials for use in education and learning for creativity and entrepreneurship. It brought together leaders in educational development from eight Universities and specialist institutions in seven countries, who produced innovative approaches to education, learning and action for entrepreneurship and creativity with their student learners. The chapters are written by individuals and teams from the project.

What are the aims of the book?

The book provides useful and accessible chapters as learning, study and reference materials; to share the intellectual outputs of the programme; the conceptions of entrepreneurship as inclusive value creation and social change, in a European context.

It provides comprehensive and high-quality educational material which can be used to develop entrepreneurship and creativity learning programmes and skills in advanced and higher education settings. It provides conceptual, research and practical models, methods and tools which educators can use in developing and delivering courses.

The book proposes entrepreneurial and creative learning, to enable people to respond to current challenges. Such learning enables people to become resilient, to show agency and leadership, and through developing and using their capacities for creativity, innovation and entrepreneurship to develop new and alternative approaches for personal, familial, organisational and wider social movements.

How does the book relate to international developments in entrepreneurship and creativity?

The book is a contribution to the vast and ever-expanding literature in the related fields of entrepreneurship, creativity and education. In this section we explain why the book has important connections and linkages with wider movements and themes. This is to help the reader to appreciate its relationship with these topics.

This is not a textbook. It is rather a book intended to be used as a teaching and learning resource, and as a collection of readings, which address one of four themes, and the subject of education for creativity and entrepreneurship as a whole. We do not provide a literature review of these fields overall; instead, each of the chapters includes its own citations and list of references to relevant literature and sources.

In recent decades, entrepreneurship education has moved from being a specialist niche interest to a general discipline with many and varied applications. The chapters in the book illustrate, for example, the applications in policy, society, ecology and economic development. There was a realisation during the later years of the 20th century that neither state nor existing corporate organisations could create the jobs and economic growth which societies, especially with growing populations, required. Before this, the role of small firms in economies had tended to be overlooked. In the UK, this was recognised in the Bolton (UK, 1971) and Birch (USA, 1979) reports, both of which led to changes in government policy to support small firms. There was a growing recognition that small (and medium-sized) firms are prime job creators and are able to respond more rapidly to changing market circumstances than large corporate and public organisations. These policy responses included encouraging entrepreneurship and small business courses in Higher Education, which increased from the 1980s, mainly in Business Schools. But this was not accompanied by much practical support for entrepreneurs starting new businesses, unless this provided a route to enable unemployed people to become self-employed.

During the editors' careers, we have seen a huge expansion in entrepreneurship education, especially over the past 20 years. There are also some notable trends we have observed. Stereotypically, entrepreneurship was perceived as the preserve of white, middle-class, college educated guys. Mainly studying Business. It didn't matter too much if the stereotype was not actually very accurate, because as a stereotype it was what people perceived. If you asked a class of students (which usually included some women and people from different ethnic groups and countries) to name entrepreneurs they could think of, the same people were named, time after time. Steve Jobs, Richard Branson, Bill Gates, Jeff Bezos, and latterly Elon Musk. All the perceived exemplars and 'role models' were out of the same kind of box. In the same way as popular TV series 'about entrepreneurs' such as 'The Apprentice' and 'Dragon's Den' (aka 'Shark Tank') promoted certain forms of behaviours as accepted, effective or valued, such media stereotypes gave learners-as-consumers misleading and narrow perceptions of entrepreneurs and entrepreneurship.

So, the most important change that education can make, towards which the editors as educators try to make a small difference every day, is embodied in this simple idea: Enterprise is for all, for everybody. Anyone can become an entrepreneur if they want to, if they aspire, and are prepared to work and learn towards that goal. This idea is, like any other proposition, arguable; you do not have to agree with it, and some will dispute it. Indeed, a lively debate in class can be stimulated by asking the question, 'Can anyone become an entrepreneur?' and then asking everyone who responds the question 'Why?' to support their views.

The point being made here is that one of the fundamental goals of entrepreneurship education is to open up opportunities, to develop mindsets of learning and creativity for everyone. This is an educational goal, as much as it is also a humanitarian, ethical, egalitarian, social, democratic and economic goal. It is a value and belief that everyone has, or should hold, the rights to freely create, to develop ideas, to innovate, to organise, and to start, own or share, grow and run their business, or preferred project or organisation.

For entrepreneurship to be open to all, to everyone, that means for all genders and sexual orientations, all social classes or castes, all levels of perceived ability, all ethnic groups, people from all languages, all faith groups, and all countries. In some countries and across Europe, these rights are protected in law, but that does not mean that, in practice, everyone in those countries actually has the freedom and the sense of personal agency to make these choices. So, education must help people to understand, appreciate and develop the personal confidence and empowerment to choose their path through life, and to challenge or avoid the barriers they may face in practising their rights.

The Global Entrepreneurship Monitor (GEM) report provides an annual global analysis of entrepreneurship in participating countries. The Total early-stage Entrepreneurial Activity (TEA) figures for each country indicate the levels of entrepreneurial participation, analysed by age groups and by gender¹. This is useful for comparing the levels of inclusion and openness to entrepreneurship within societies. One of the areas in which we have seen most progress since GEM was launched in 1999, is in entrepreneurial participation by women. Whilst overall, men are more likely to become entrepreneurs than women, the gender gap is decreasing, creating more gender equity within societies.

Female participation in entrepreneurship is highly important for countries' economic and social development, as well as families and individuals. There are positive associations between female educational participation and entrepreneurship, as well as economic empowerment, personal and family health, creative and cultural development, financial inclusion, and other indicators of progress and wealth. Again, education plays a vital role in changing attitudes and empowering women to consider these matters.

But whilst there we can demonstrate the progressive influence of entrepreneurship in these ways, there are also 'traditional' interests in many societies which see entrepreneurship, and especially female entrepreneurship, as a threat to their view of society. At a national level, women are losing almost all rights of public participation and equality in some countries such as Afghanistan and Iran, whilst in parts of countries such as Pakistan, Saudi Arabia and others, their rights are still heavily restricted. Yet most of these are also societies with pockets of high levels of poverty, deprivation, and need for educational, social and economic development. And there are many signs that women in these societies do not accept, and seek to change these restrictions.

Providing a global policy for change, the United Nations Sustainable Development Goals (UN SDGs)² set out an internationally agreed framework for sustainable development towards 2030. Education, entrepreneurship, social inclusion and innovation are vital dynamics for making progress to achieve these goals, as several chapters in this book demonstrate. Alongside these, and as a means of helping to achieve them, we could also see 'Entrepreneurial rights as human rights'; and that 'economic rights must include the human right to science and the freedom to grow through innovation'. This is the subject by a book of the same title by Philip Aerni (2015)³ which eloquently makes the case for entrepreneurial rights as a means of individual, societal, environmental and economic progression.

1. <https://www.gemconsortium.org/>

2. <https://sdgs.un.org/goals>

3. Aerni, P. 2015. *Entrepreneurial rights as human rights: Why economic rights must include the human right to science and the freedom to grow through innovation*. https://www.researchgate.net/publication/280013575_Entrepreneurial_rights_as_human_rights_Why_economic_rights_must_include_the_human_right_to_science_and_the_freedom_to_grow_through_innovation

How is the book organised? How do I find what is useful for me?

This is developed through four macro-level themes, each of which comprises four or five chapters from the book:

1. Creative entrepreneurship and human development
2. Pedagogies for creative learning and education
3. Pedagogies for entrepreneurial learning and education
4. Social, community, and collective learning for creativity and enterprise.

The purpose and scope of each of these is outlined below.

What is in each section of the book?

A synopsis of each chapter in relation to the theme is included below, within this thematic structure.

1. Creative entrepreneurship and human development

This first theme explores the relationship between human learning, and the development of creative and entrepreneurial behaviours. It includes at the start two introductory chapters, covering basic concepts in creativity and entrepreneurship. These explain underlying ideas, terms and theories which will be useful in moving on to the more advanced chapters. Alternatively, they may be skipped by readers with prior knowledge.

The theme explores how learning creative behaviours and entrepreneurial skills represent long-standing and innate higher-level capabilities in all humans. They are not simply areas of knowledge to be studied, but fundamental competences for personal, social and aspirational development. The following chapters address, and make important new contributions to understanding: Biology, culture and creativity; how neuroscience can inform entrepreneurial behaviour, creativity and education; and early influences on entrepreneurship career path development.

1.1 Basics and theories of creativity

Creativity is a fundamental skill for human adaptation in society. This chapter introduces theories on creative thinking: Psychoanalytic theory, Gestalt theory, Humanistic theory, Associative theory, Perceptual theory, Factorial theory and Environmental theory. It explores factors and variables which play roles in the development of creativity, and different ways to apply creativity, in learning and in everyday actions and interpersonal relationships.

1.2 The basic principles of entrepreneurship

This introductory chapter presents concepts and definitions of entrepreneurship, types

of entrepreneurship and entrepreneurship characteristics. It explains how entrepreneurship has evolved through economic and social history into contemporary society.

1.3 Understanding human creativity through biology, genetics and culture

This chapter addresses the origin and development of creativity in human beings from a biological perspective. It explores intersubjectively the advances in genetics and the influence of culture in the development of creativity in humans, as core elements of the future development of creativity in different frameworks. These include genomics, neural networks and their plasticity is providing educators with valuable information for new teaching methods enabling the development of creativity as an important part of the entrepreneurship process.

1.4 How can neuroscience inform entrepreneurial behaviour, creativity and education?

This chapter discusses the potential for neuroscience in understanding entrepreneurship and creativity. Through an interdisciplinary approach, it analyses how neuroscience can advance entrepreneurship and creativity theories. It explores the concept of 'neuro-entrepreneurship', and how this could help to create better understanding of the roles of experience, intuition and insight in entrepreneurial creativity.

1.5 Early influences on entrepreneurship career path development

This chapter explores the importance of early career influences on professional growth of the individual. It addresses the nature and importance of career development; career-building areas of activity; career development tasks during life cycles; and the impact of labour market changes on career development. It is relevant to teachers, students, students' parents, and others interested in career development for students.

2. Pedagogies for creative learning and education

The following two themed sections focus on pedagogies for learning and education, firstly in the field of creativity (theme 2), and in entrepreneurship (theme 3). In the following section, chapters are intended to help readers, and especially educators, to explore ways of enabling creativity and creative learning. The section on creativity includes chapters on: the creative curriculum; creativity and critical thinking; fostering creativity in students; and educational strategies for teaching creativity.

2.1 The creative curriculum

This chapter reports success stories of artist-entrepreneurs who have turned their creativity into an active business. It includes four success stories collected and told through key questions used to trace individual paths taken by the participants. These provide

practical examples of problems, challenges, accidents, training and successes from real-life experiences, providing stories and situations. These give the reader both theoretical and also practical knowledge of how to manage their creative career.

2.2 Creativity and critical thinking: Conceptions and dynamics

Both creativity (C) and critical thinking (CT) are current and crucial competencies increasingly demanded by organisations in the 21st century, requiring a core shift in educational policy. This chapter explains how understandings of C and CT imply a dynamic of in(ter)dependent complementarity. Creativity is a multifaceted and complex phenomenon for which the chapter gives a broad grounded description. Critical thinking is described as the ability to think rationally and reflexively, to decide what to believe or do, and by administering intellectual standards to the contents of thinking processes. Alternative conceptions of methodological scepticism; activist engagement with knowledge; and the exercise of self-reflexivity are outlined.

2.3 Fostering creativity in students: Tools and methods for teachers

This work explores the crucial role of creativity in students' personality and the significance of nurturing creative potential through education. It presents exercises which teachers can use to enhance students' creative abilities. It provides educators with practical techniques to cultivate creativity in pupils and students at any level, and empower their full creative potential and lifelong skills.

2.4 Educational strategies for teaching creativity

This chapter builds on chapter 1.3, and presents current examples of pedagogical development, showing how these can be used in different educational levels to foster creativity: the so-called Flipped Classroom and problem-based learning.

3. Pedagogies for entrepreneurial learning and education

Theme 3 - the book's second section on pedagogy - is intended to help readers think about how entrepreneurship can be learned as well as taught. It addresses entrepreneurial learning and education through five chapters. These address enterprise education in schools; green entrepreneurship education in the Latvian context; entrepreneurial competence in live and virtual learning environments; a study on the effects of creative student education on entrepreneurship and economic sustainability; and on nurturing the entrepreneurial mindset.

3.1 Enterprise education – developing and structuring positive learning experiences

Enterprise education is less about what we teach students and more about how stu-

dents learn. For learning to be effective, teachers must address two essential concerns, firstly, constructing an appropriate learning environment and secondly, designing and delivering enterprise learning activities which develop not only student knowledge and understanding of enterprise, but also provide opportunities for learners to develop a full range of entrepreneurial competencies, ideally in real life scenarios. The chapter recommends a ten-point educational strategy for enterprise education in schools, with a process of designing and delivering effective enterprise learning experiences. This provides an agenda for professional development through enterprise education as a vehicle for school and college improvement.

3.2 Enhancing green entrepreneurship education and skills in the context of Latvia

This chapter presents the findings of an academic literature review on entrepreneurship education, green entrepreneurship education and green entrepreneurial mindset development in general education. Entrepreneurial competence is analysed from different viewpoints emphasising topicalities related to sustainable and green education. It presents a theoretical model of a green entrepreneurial mindset, with application beyond the Latvian context.

3.3 The entrepreneurial competence: face to face and virtual learning environments to foster entrepreneurship in the post-pandemic age

This chapter observes how human beings deploy their creative, innovative, and entrepreneurial capacity to develop multiple 'intersections' across disciplines and areas of knowledge that accelerate or facilitate adaptation to new circumstances. It reflects on two questions: which elements are important in the development of entrepreneurship as a competence; and which methodologies are particularly suitable for teaching this competence in formal education.

3.4 The effects of creative student education on entrepreneurship and economic sustainability in economics and management sciences

This chapter reports a study examining the effects of developing creative economics and management students with knowledge in, and skills and understanding of entrepreneurship and economic sustainability. The relationship between the effectiveness of entrepreneurship education and individual creativity levels of students is analysed. The results indicate high participant scores for the effectiveness of entrepreneurship education, showing a positive relationship between the individual creativity level and the level of entrepreneurship education effectiveness.

3.5 Nurturing the entrepreneurial mindset: Exploring motivation, personality, and Creativity in Entrepreneurship

This chapter explores multifaceted personal aspects of entrepreneurship, specifically personality traits, motivations, skills, and creativity which drive individuals towards becoming successful entrepreneurs. It draws on theories to highlight the importance of adaptability and effort in navigating the complex entrepreneurial environment. It explores the role of motivation as an entrepreneurial driving force, encompassing factors including financial reward, personal fulfilment, social impact, and professional autonomy.

4. Social, community, and collective learning for creativity and enterprise

The fourth theme explores learning beyond the individual, through their participation in social, community and collective endeavours which develop capabilities in both creativity and enterprise. It comprises four chapters, covering: communities of practice and creativity; creativity as both singular and plural action; creativity and entrepreneurship enacted through the framework of the UN SDGs; and co-creative design in education.

4.1 Communities of practice and creativity

This chapter explains the role of creativity and innovation in Communities of Practice (CoPs) as defined by Wenger (1998). CoPs are groups of individuals who come together to share a common interest, profession, or passion with the goal of learning from each other and improving their skills and knowledge in various settings such as workplaces, schools, and online communities. CoPs provide an environment where new and valuable ideas can develop, but to function effectively, trust, a shared language, and a common goal are necessary.

4.2 Creativity is plural as well as Singular

This chapter introduces plural and social creativity for educators, learners and people who wish to enhance their shared creativity. It aims to prompt readers' creative thinking, working and collaboration. It explores the role of prospective imagination features in creative entrepreneurship; and how individual and collective imaginations and intelligences can be utilised to create future scenarios, experiences, artefacts and realities.

4.3 Creativity and entrepreneurship in higher education through the framework of the Sustainable Development Goals

The UN Sustainable Development Goals ('SDGs'), defined in Agenda 2030, aim to encourage a sustainable perspective and mindset for society. This chapter introduces a SDG framework to help teachers and students connect education for sustainable development, education for creativity, innovation and entrepreneurship. Becoming aware of the main sustainability issues, and developing the essential competencies for acting as

responsible citizens is crucial to find effective and sustainable solutions for the pressing environmental, social and economic problems affecting our future.

4.4 Co-creative design in education: some practical examples

This chapter provides a personal account by an industrial and educational designer of creative practice. It presents empirical reflections on the creative design journey and how digital tools facilitate the transition to co-creative design implementing cooperative know-how. Drawing on personal experiences of work challenges to creativity and finding solutions typical of entrepreneurial life, the author describes and illustrates the process of creative development in a series of stages with examples. The reflection encompasses lifelong experiences up to today's collaboration tools which open new scenarios for creative capacity stimulated by interaction and collaboration. The author defines solutions as the outcome of a creative process, inspired by real and digital contexts, explaining how co-creation has become an accepted and necessary way of working.

Invitation

We as editors and authors hope that you discover new ideas and realise new insights on the combinations of creativity and entrepreneurship through learning within this book.

Please feel free to take and use what you find useful or interesting, kindly acknowledge its source, and use it to grow and help yourself and others. Do also let us know what works best for you. Last but not least: enjoy!

Editors:

Professor David Rae,

Dr Regina Frank,

Professor Malcolm Hoare,

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October 2023

Theme 1

Creative entrepreneurship
and human development

Chapter 1.1

Basics and Theories of Creativity

Abstract:

Creativity is one of the skills that people are expected to have the most in the history of humanity. It is the ability that individuals living in society should have to increase the welfare level of today's societies and to meet current and future needs. Creative thinking is the most used concepts related to creativity. Creative thinking mostly refers to mental activities, while creativity refers to both mental activities and performance-based physical activities. The theories about creative thinking: Psychoanalytic theory, Gestalt theory, Humanistic theory, Associative theory, Perceptual theory, Factorial theory and Environmental theory. Creativity is manifested not only in producing new theories and inventions, but also in our daily actions, using language, and interpersonal relationships. Some factors play a role in the development of creativity: Heredity and environment, birth order, gender, socio-economic level, age, intelligence, personality, family, and education.

Keywords:

Creativity; creative thinking; creativity theories; intelligence; human skills;

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Chapter Structure:

1. Introduction
2. Definition of creativity
3. Creative thinking
4. Theories of creative thinking
5. Mental processes of creativity
6. Creativity and brain
7. Factors affecting the development of creativity
8. Factors promoting and preventing creativity
9. Conclusion
10. References

1 Introduction

This book chapter is about the definition of creativity, creative thinking, dimensions of creativity, theories of creativity, classical division in the process of the emergence of creativity, mental processes of creativity and factors affecting creativity. For these concepts to be better understood by the reader, activities related to the subject are included at the end of each section of the chapter, as well as extra online resources. To understand the subject well, it is recommended not to move on to the next subject before the activities are completed.

2 Definition of creativity

There are many different definitions of creativity with different aspects. The English word “create” comes from the Latin word “creare” and used to mean “to produce, make or create” (Andreasen, 2005). Creativity is defined as “the use of imagination or original ideas to create something; inventiveness” in Oxford Dictionary (Stevenson, 2010). When looking at the root of the word creativity, it is seen that it derives from creating. Creating, is to create a new product, to create a non-existent emotion, thought or an object. Ryhammar & Brolin (1999) claim that producing new ideas or novel products is one of the essential of human beings. Sternberg and Lubart (1999) defined creativity as “the capacity to create a solution that is both novel and appropriate”. According to Penke (2003:1), creativity valued as a property of pieces of art or literature, musical compositions, scientific works, narrations, witty comments, decorations, technical or



Figure 1. Creativity; Source: <https://www.nadeenschool.com/wp-content/uploads/2019/02/what-is-creativity.jpg>

social inventions. Also, Cardoso et al. (2015) defines creativity is the ability that individuals living in society should have to increase the welfare level of today’s societies and to meet current and future needs. Creativity is seen as a skill that can be developed, although at different levels in everyone. While creativity emerges as a special talent in some individuals, it is seen as a skill used in ordinary jobs in some individuals (Çetin, 2010). Moreover, Higgins (1999) states that creativity is the production of new solutions for existing situations by simply using information and using different methods. Torrance (1988), in many studies on creativity, defined creativity as being sensitive to information deficiencies and inconsistencies, making guesses, looking for solutions to problems, developing trials about different problems, being strong against difficulties or deficiencies, and putting forth the result against these trials. Another authority, Guilford (1987), who has many studies on this subject, defined creativity as a part of mental skill and defined it as changing the expanding thought in different ways. About creativity, he said that people should try to solve their problems and think differently. Urban (1991) and Kurtuluş (2012) also defined creativity as the ability of an individual to instinctively use this power to solve her/his problems and to create different results with these abilities. Vygotsky (2004) sees creative behaviors as future-oriented production behaviors by making changes on the past. These creative actions are based on imagination skills that bring together many processes in the mind. According to this approach of Vygotsky (2004), the fact that preschool children tend to dream constantly, shows that their creative behaviors are at a high level in this period. Today, Lee (2005) defines creativity as people’s engagement with unique thinking to find better things with an inner feeling. Another definition is that, by approaching creativity from a classical perspective, it is claimed that an already known knowledge, ability and similar things are carried beyond the known and interpreted with a new perspective and something new emerges (Jaarsveld et. al., 2012). The definitions of creativity are summarized in Table 1.

Table 1. Definition of creativity

Defined creativity as	Who support
Cognitive processes	Guilford, 1952; Torrance, 1964; Nusbaum and Silvia, 2011
Dealing with imagination or fantasies	Vygotsky, 2004; Anderson et. al., 2001
Dealing with new, original, and useful products or ideas	Mayer, 1999; Sternberg and Lubart, 1996

Activity Corner:

Who do you think is the most creative person you know?

Why do you think this person is creative?

So, what did this person come up with as a creator and what contribution did he or she make to humanity?

Who is the most creative person? and why?

Albert Einstein

Thomas Edison

Louis Pasteur

Wolfgang Amadeus Mozart

Elvis Presley

Michael Jordan

Usain Bolt

Christopher Columbus

Marco Polo

Others

Online sources:

<https://artincontext.org/what-is-creativity/>

<https://www.britannica.com/topic/creativity>

https://www.youtube.com/watch?v=zNHDTvqbUm4&ab_channel=BigThink

3 Creative thinking

One of the most used concepts related to creativity is creative thinking. Creative thinking means generating new ideas and adding new ones to them. Creative thinking is the process of establishing relationships between previously unrelated objects or thoughts

(Üstündağ, 2003) through the creation of an infinite number of thoughts, combinations, and connections by the human brain (Yenilmez & Çalışkan, 2011). Creative thinking consists of such elements: using the mental process; the ability to think of useful ideas; finding original inventions; the ability to try different ways to invent something new; finding new ideas and innovations; being able to find the existence of problems that need to be solved urgently while transforming their ideas into productive results; the ability to turn their ideas into a fruitful result; the ability to make new connections based on various pieces of information.

The fact that the creative thinking dimensions are so diverse means that there are differences between people's creative thinking and differences in their use of these dimensions (Ergen, 2013). Guilford (1967) and Torrance (1988) stated as the main sub-dimensions of creative thinking are fluency, flexibility, originality, and enrichment (elaboration), Davis, (2003) and Tardif & Sternberg, (1988) also added finding the problem, defining the problem, analogical thinking, analysis, synthesis, evaluation, intuition, innovation, logical thinking, aesthetic thinking, producing a solution to problems as new dimensions.

Kaufman (2019) stated that the study of creativity gives us better art, far from destroying the artist. Creativity can improve an artist's life-or a scientist's life, or a businessperson's life. Creativity affects a lot of different people and they do offer opportunities to learn about people's beliefs, values, and perceptions about their own creativity and the construct itself. Based on these perspectives, Kaufman (2019) said that creativity or creative thinking is so important topic for all people nowadays.

Online sources:

<https://www.thebalancecareers.com/creative-thinking-definition-with-examples-2063744>

<https://www.betterup.com/blog/creative-thinking>

<https://www.skillsyouneed.com/ps/creative-thinking.html>

https://www.youtube.com/watch?v=bEusrD8g-dM&ab_channel=TEDxTalks

https://www.youtube.com/watch?v=zO2LdDpx-Tc&ab_channel=Videojug

Sub-dimensions of creativity

On this section, some dimensions based on Guilford (1967) perception are defined and an activity based on the dimensions are proposed. Please think of a topic, such as a social problem pending solution, or a product waiting to be developed. Fill out the activity corner in table 2 with the possible solutions or ideas of the topic. Creativity sub-dimensions are below:

Table 2. Sub-dimensions of creativity and activity sheet

Activity Corner		
Topic (Social problem or product be developed)		
Sub-dimensions	Definitions	Please apply the sub-dimensions for the solution
Fluency	<ul style="list-style-type: none"> -generate a large amount of thought, outcome, or possibility (Guilford, 1986) -produce many verbal and nonverbal ideas (Jaarsveldt, 2011) -think many ideas together and build relationships 	
Flexibility	<ul style="list-style-type: none"> -move from one field to another to generate ideas -adapt to new and unconventional situations (Kontaş, 2015) -think in different ways by generating different ideas -use different approaches and strategies when solving a problem 	
Originality	<ul style="list-style-type: none"> -idiosyncratic ideas for developing new, valuable tangible or intangible products (Guilford, 1986) -produce unusual, different and unique solutions in the face of a problem (Guilford & Vaughan, 1962) -producing original ideas or products requires free thinking (Oğuzkan et al., 2001) 	
Elaboration	<ul style="list-style-type: none"> -explore and apply the ideas obtained (Guilford, 1986; Vetillart, 2014) -develop, decorate and beautify the idea or product by adding details (Kontaş, 2015) -forming an idea, thinking about the idea, concentrating on different thoughts, adding details to the ideas -multidimensional thinking, looking from different perspectives, empathizing, thinking in reverse, and three-dimensional approach (Turaşlı, 2010) -the ideas add flexibility, sensitivity, and originality to the individual and society (Argun, 2004; Atasoy et al., 2007). 	

4 Theories of creative thinking

Theories and approaches created to understand creativity, as well as definitions of creativity, also vary. Various scientists have different views and theories about creative thinking. Some of the theories are given below:

Psychoanalytic Theory of Creative Thinking

According to psychoanalysts, creativity is emerged as the product of assertiveness with instinctive impulses. Creativity has been defined as the expression of the subconscious (Liu, 2018). Such behaviors emerge when the internal conflicts and aggressive energy of the person turn into products adopted by the society (Ülgen, 1990). Representatives of psychoanalytic approach such as Jung, Adler, Kris, Rank, Kubie (Bergmann, 1988), especially Freud (1959), stated that creativity is an expression of the subconscious. He emphasized that creativity comes from the same root as neuroses (Stewart, 2013), but creative personalities can transform their subconscious impulses into creativity by loosening the control of the "I" (Argun, 2004; Vexliard, 1996).

Two types of creative processes are identified: psychological and imaginary (Lawson, 2008). The psychological model deals with items derived from one's field of consciousness. It includes emotional events and life crises, which have an important place in a person's life. The imaginary process, on the other hand, emerges from the depths of the collective unconscious and is fed with energy that cannot be spent to satisfy the instincts (cited: Argun, 2004).

According to Kris (1953), the creativity process consists of two stages: the inspirational stage and the elaborational stage. Kris (1953) especially emphasized the first stage and stated that, the individual should temporarily get rid of mathematical, logical, and rational thought processes and get rid of the obstacles in front of thinking. Moreover, Kubie's (1958) focus is the permanent effect of neurotic behaviors on creative thinking and fear, guilt and similar neurotic personality aspects limit creative production. He reported that the creative process lies in the freedom to collect, combine, compare, and reprocess information (cited: Ceran, 2010). According to Adler (2014), the essence of personality is the creative self, which is unique to each person. Adler (2019) argues that human beings construct their own personality with their unique abilities and by the creative self in line with the influence of their environment.

Gestalt Creative Thinking Theory

Gestalt used the concepts of "productive thinking" and "problem solving" instead of creativity (Wertheimer, 1985). Based on Gestalt theory, creativity is to rediscover a sit-

uation, to rediscover the situation in a new whole, depending on the problems to be solved or the difficulties that arise. While Gestaltists look for a solution to a problem, the problem is seen as a whole and a solution is reached, or the incomplete one is seen as a non-whole problem, and completion is attempted. These individuals go deeper into the problem and reflect on the structure of the problem. Thinking about the problem and its solution enables them to approach the solution of the problem (Brett & Michael, 2017). Wertheimer (1985) mentions three ways of thinking: These are;

-
- Creative productive thinking: It is a way of thinking that includes grouping, reorganizing, and seeing the main factors and finding new solutions.
 - Blind thinking: It is mechanical random thinking with uncertain direction and purpose. Here, the individual acts randomly without realizing the events.
 - Semi-productive, creative, semi-mechanical blind thinking system: This thinking system is located between the other two thought systems.
-

Humanistic Theory of Creative Thinking

This theory argues that people should be considered as a whole and should be evaluated with their experiences, the environment they live in, and the special interest and motivation they have (Doğan, 2012). According to this approach, people should be able to manage their life the way they want. The two pioneers of this theory are Rogers and Maslow. According to Rogers (1995), creativity is part of being a healthy person. Human nature should be understood as conscious, self-directed, self-actualizing and trying to be a healthy individual (Karkockiene, 2005). Maslow (1959) sees creativity as an individual's life guide. According to Maslow (1959), creativity is a step taken for the individual's self-realization and that creativity should be evaluated as a product, an idea, an attitude, an activity, and a process. Psychologists who advocate this theory state that the products revealed as creativity should be evaluated in terms of the value they add to humanity and their effects on social life (Sezgin, 2004).

Associative Creative Thinking Theory

According to this theory, creativity is to create new combinations by bringing together certain connotation elements that work or fulfill certain conditions (Mednick, 1962). The new combinations that emerged form the basis of the association approach. In associative theory, creativity brings something new to the fore, but creates something new that cannot be reduced to something known and cannot be associated with something old (Vexliard, 1996). In the association approach, creative solutions can be formed through positive coincidence, similarity, and mediation (Çakmak, 2010):

- Positive coincidence: It is defined as the occurrence of possible association items because of coincidences. For example, it is the scientist trying to obtain new useful combinations by randomly matching different physics events through positive coincidences (Okutan, 2012).
 - Similarity: It is the emergence of products that are associated with each other because of similarity. It is generally found in fields such as painting and music.
 - Mediation: It is called to come to mind through the mediation of the common features found in the association elements. For example, the symbols used in association mediate finding each other. Bringing distant ideas and thoughts to mind through associations and bringing new ideas will facilitate creative solutions (Pala, 1999).
-

Mednick (1962) is one of the important contributions to this theory via Distant Association Test and touched on the issue of creativity. According to Mednick (1962), everyone's creativity is different. An individual's level of creativity depends on her/his associative level. The divergent thinking skills of creative individuals are more developed.

Perceptual Creative Thinking Theory

According to this theory, creativity starts with the effect of connecting with the outside world, motivated by the environment and arises from perceptual openness, which allows to approach an object from different perspectives (Tanju, 2014). If this perceptual action is carried out together with motivation, creativity emerges in the person (Kara, 2007). This theory provides diversity by directing the person to different thoughts without limiting the person with traditional thinking to be creative. This diversity has enabled us to approach events from different perspectives, to evaluate the dimensions, process, and results of creativity from different perspectives, and to reveal different theories.

Factorial (Complex) Creative Thinking Theory

Guilford (1959), based on his studies, introduced the "structure of human intelligence" model by reducing intelligence to basic factors. He stated that intelligence is three-dimensional. They are classified as operations (mental activities), products (how they comprehend information and what answers they give) and content (materials used for mental operations). Among these mental activities, the most attention was drawn to the dimension of operations. Guilford (1959) argued that convergent thinking is important for creativity, but divergent thinking is much more important for creativity. A mix of convergent and divergent thinking is used to solve problems or in processes of projects (Guilford, 1967). Divergent thinking is used to discover all the possible causes of the problem then convergent thinking is used to narrow down the one potential cause of the problem. After then, divergent thinking is switched back to find all the possible

solutions to the problem. Convergent thinking is used once again to determine the best solution.

Convergent thinking is to arrive at the solution of a problem based on what is known to be correct. Individuals with this way of thinking seek solutions to their problems by following traditional and familiar ways. The answer s/he finds to the problem will most likely be an answer that has gone through similar stages before and reached a similar conclusion. If it has gone through similar problems before and has solved the problems, it is most likely that the solution to this problem is ready as well. Convergent thinking is a safe, methodical, conservative way of thinking (Kara, 2007; Öncü, 1989). Intelligence tests are generally prepared for such thinking styles.

Divergent thinking, criticizes the known and learned, corrects it if necessary, and thinks about what might happen and tries to comment on unknown, unclear ideas. It tries to produce new solutions that have never been seen before, from the known to the unknown. It tries to produce more than one different solution, can find more than one solution for a problem, and each solution can be correct and valid. Guilford (1967) called it a creative way of thinking.

Online sources:

<https://www.thinkcompany.com/blog/divergent-thinking-vs-convergent-thinking/>

<https://practicalpie.com/convergent-vs-divergent-thinking/>

<https://asana.com/resources/convergent-vs-divergent>

Environmental Creative Thinking Theory

According to this theory, creative behavior is behavior learned through qualified experiences. This behavior leads to original solutions in problem solving. For creative behavior to emerge, the individual must be trained. Developing problem solving skills can solve this problem. For this, the problem-solving skills of individuals can be developed by continuing the trials for a certain period. People can use the problem-solving experiences they have learned to solve similar problems that they will encounter later (Ceylan, 2008). Creative individuals can solve new problems that they will encounter later by using many samples problem solving methods that they know how to use (Akçum, 2005).

Activity corner

Theories

Please write the definition of the theory in your own words

Please give appropriate examples in your own words

Psychoanalytic Theory

Gestalt Theory

Humanistic Theory

Associative Theory

Perceptual Theory

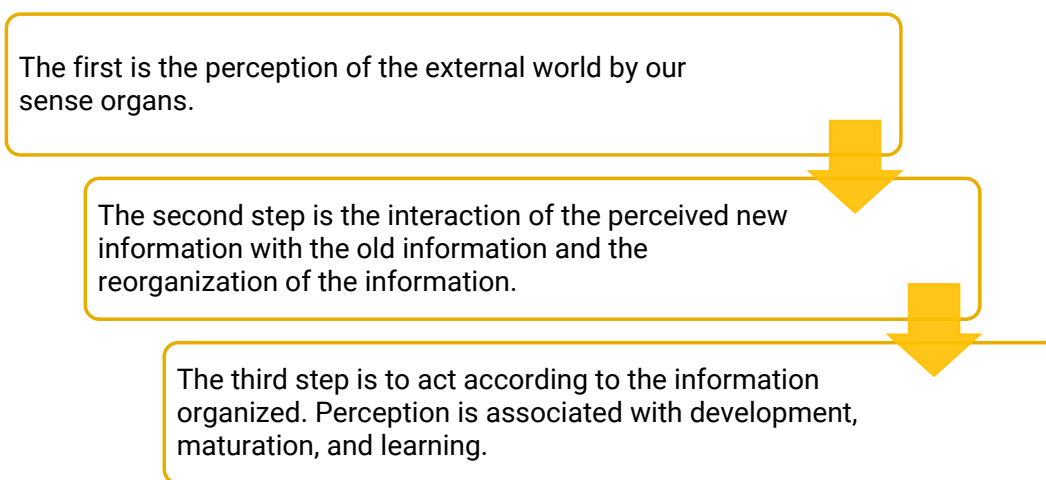
Factorial (Complex) Theory

Environmental Theory

5 Mental processes of creativity

Rogers (1959) defined the creative process as the formation of the beginning of relational products that constitute materials, events, people, or conditions, while seeing the creative process as unique and different for the individual. Creativity is considered both as a process and as an original product that emerges at the end of this process (cited: Aktamış & Ergin, 2007). These processes are:

Perception: The thought process plays an important role in the formation of creativity. Cognitive process starts with perception. Perception consists of three basic elements.



Source: Yıldız & Şener, 2003.

Visual and tactile perceptions are especially important for creativity. In understanding what we see with visual perceptions; we can distinguish objects around us with tactile perceptions (Atkinson et al. 2000; Pala, 1999).



Figure 2. Perception; Source: <https://tr.pinterest.com/pin/238057530286663435/>

Emotion: The impressions and feelings that certain objects and events evoke in the inner world of individuals are called emotions. Each person has a unique emotional structure. Emotions have a special place in the formation and development of creativity. Emotional concepts and ideas in the work are formed because of people expressing their emotions, which they pass through the mind, in a work of art. The colors, smells, and shapes we perceive through our emotions have emotional characteristics. Emotions, conflicts between emotions, feelings that occur in the relationship of the individual with the environment or emotional turbulence in the inner world of the individual affect the creativity of the individual. People's perspectives on life are different. These different perspectives emerge when people accompany their emotions (Pala, 1999; Yıldız & Şener, 2003).

Image: An image is a sensation that comes to life spontaneously in the mind of a person without any stimulus. Concrete experiences are needed for the formation of images. And this consists of experiences obtained from the five senses (Pala, 1999; Sezgin, 2004). Images formed because of concrete experiences become a part of our inner world over time. Each image contains a lot of sensory and objective information (Sezgin, 2004).

Imagination: Visualizing something in the mind is called imagination. Through imagination, we visualize people, events, feelings, and experiences that are not with you at that moment and perceive them as if they were happening (Johnson et al., 1988).

Human thinking occurs in two ways. One is propositional thinking, and the other is imaginative thinking. In general, our way of thinking is thinking in visual images. Even though we are not aware of it, we often think visually. In this way of thinking, previously recorded perceptions play a role. Because while thinking, previously recorded perceptions or parts of perceptions are recalled and animated. Imagination style thinking is the formation of a link between past experiences by putting into a new form and present experiences. Different and original designs emerge thanks to the bonds and organizations established between the old life and the new life (Yıldız & Şener, 2003).

Symbols: Symbols are a way of expressing an event, emotion, thought or object by using abbreviations such as concrete objects, signs or symbols instead of images (Goodman, 1976). At this stage, images lose their original form in their origins and leave them to concrete concepts that have been selected, purified, and rearranged. Symbols are temporary representations of an object or event. In an active thinking process, we use symbols instead of images. First, symbols are formed in the child, and then the transition to comprehension is provided. One of the important processes in the development of the child's creativity is the transition from symbols to comprehension (Ceylan, 2008).

Metaphor: It is the use of a concept in a different sense other than the existing meaning

of knowledge. Metaphor is a form that enriches thoughts and meanings. Associations that are effective in giving meaning to people's lives, expressions and emotions create metaphorical meanings. Metaphors can combine interestingness, difference, originality, flexibility, and sensitivity. The metaphorical expressions used in humor environments provide flexibility in the mind. People with mental flexibility can look at events from different perspectives, have patience with uncertainties, take risks in the face of events, learn from their mistakes, and seek solutions to their problems by trying new ways (Yıldız & Şener, 2003).

Most scientists who conduct scientific studies on creativity state that there is a relationship between creativity and the brain. This relationship can be explained as follows.

6 Creativity and brain

Creativity is manifested not only in producing new theories and inventions, but also in our daily actions, using language, and interpersonal relationships. Intelligence and creativity are strongly related, and both have similar neurobiological structures (Jensen, 1998). The density of synaptic connections in the brains of intelligent and creative people probably differs from other people.



Figure 3. Creativity and Brain Source: <https://www.canstockphoto.com/brain-left-and-right-30978333.html>

Problems that require creativity are difficult to solve. The reason is that the neural circuits required to solve such problems have weak connections. The probability of the brain making the necessary connections to solve this problem is very small. In the process of solving such problems, some connections must be formed in the brain. The preparatory period, during this period, various lobes of the brain (visual, auditory, language and motor areas) stimulate the relevant neural and activate them. Thus, the subnets of the brain become “primed”. Solving difficult problems requires long incubation periods. Sometimes, the solution process of the problem may follow a period of despair. In this process, solution-oriented dreams are produced. These dreams are associated with one’s creativity. Imagination activates the brain’s responsible subnets, increases neural activity in the brain, and enables the generation and discovery of interesting ideas and solutions. As a result, partial solutions are produced. These partial solutions enable the formation of new ideas, the formation of associations, the awakening of emotions, the emergence of new concepts and the production of more permanent solutions (Duch, 2007).

7 Factors affecting the development of creativity

There are some factors that play a role in the development of creativity. These are:

Heredity and environment: Creativity is an innate talent and heredity plays an important role in creativity. Heredity influences people having similar and different characteristics and defined as the continuation of parents and previous generations. While many characteristics of the child are like their parents, many of their characteristics come from the environment in which they live. Therefore, although children do not resemble their parents, they inherit many characteristics. The geography, climate, terrain, and the society in which a person lives are an important factor in shaping the character of a person (Fox & Schirmacher, 2014). Apart from the inherited creativity, supporting environmental needs of the child such as meeting his physical needs, making cooperation possible, welcoming his original ideas with tolerance, making activities aimed at making good use of time, supporting the desire for research and investigation, supporting new approaches in problem solving, providing a sense of trust, and providing materials that will increase their imagination positively affect the development of creativity (Gürsoy, 2001)

Birth order: Some studies showed that the order of birth influences the creativity level of the child. The only child, last child, and middle child are often more creative than the first-born. The reason for this is that families put more pressure on first-born children than on later-born children. It is very difficult for creativity to emerge in children who grow up under pressure. In families with one child, less pressure is generally applied than children with siblings. The families with one child support much more for their children’s individual development and their children reach the tools for their development much more easily (Gürsoy, 2001).

Gender: In general, although a relationship between creativity and gender is not expected, it is thought that social and cultural variables influence gender (Argun, 2004). Some studies reveal that girls and boys differ from each other in certain special abilities. Girls have higher language abilities (Huttenlocher et al., 1991) and boys have higher numerical abilities (Benbow & Stanley, 1980). Since language skills have an important place in ability tests, girls' creativity tests are higher than boys (Harmanlı, 2002). Discussions on the relationship between creativity and the gender variable continue today. However, most studies reveal that highly creative individuals can accept the roles of the opposite sex more easily (Csikszentmihalyi, 1997).

Socio-Economic Level: The children of families at the upper socio-economic level are more advantageous in terms of creativity compared to the children from the lower socio-economic level. The main reason for this is that families in the upper socio-economic level generally become more conscious and democratic in child education since their cultural level is high. A democratic attitude and education enable the child's creativity to emerge. In addition, such an environment provides the child with the opportunity to reach the information and materials necessary for creativity (Gürsoy, 2001).

Age: Childhood reflects inexperience and naivete compared to youth and maturity. Besides, children have an endless imagination. As age progresses, experience increase, imagination decreases. Experiences, especially techniques related to creative thinking, can affect creativity positively. Imagination is important in creativity. Since children have imagination, their creativity is quite high in childhood (Harmanlı, 2002). They can easily come up with something new. As they get older, their imagination decreases, so their creativity decreases.

During childhood and adolescence, the individual must obtain the necessary information from the environment to be creative. Therefore, in this period, the individual tries to learn everything s/he is curious about events, facts, or objects by asking the people around her/him and tries to understand the outside world. The individual interacts with the outside world with her/his own feelings and thoughts. In this process, teachers, parents, and friends feel threatened by the highly creative child who questions her/his environment, is curious about everything. They are disturbed by the questions asked and new ideas. These creative thoughts in children and young people are perceived as aggressive and even hostile by their environment. The reactions given in this process may cause children or young people to experience personality problems in the future (Sungur, 1997).

Intelligence: Intelligence and creativity are two different concepts. Most creative people are also intelligent, but all intelligent people are not creative (Harmanlı, 2002). Studies examining the relationship between creativity and intelligence have not reached a definitive conclusion explaining the relationship between them. Studies have shown that there is no high correlation between intelligence and creativity (Getzels & Jackson, 1962; Torrance, 1965; Wallach & Kogan, 1967). Accordingly, a high level of intelligence does not mean a high level of creativity (Sternberg, 1999). In addition, although creativity and intelligence are separate abilities, it is accepted that a certain level of intelligence is required for creativity (Gürsoy, 2001). According to Guilford (1967), creative people tend to work hard, can work long hours, and have a general motivation to work.

The view that intelligence alone is not a determining variable in creativity is common. Art educators and psychologists accept argument that gifted people can have a creative identity and produce superior works, or vice versa, is not true (Artut, 2002). There are many examples that gifted people can have a creative identity, and individuals with low intelligence can also be creative.

Personality: Studies have also revealed that the reason for the differences in people's creativity levels is due to non-cognitive characteristics (Güven, 1999). This has led to the focus on people's personality traits as creativity traits. Researchers have stated that creative people are individuals with independent, flexible thinking, open to innovations, tolerant, crazy ideas, original ideas, playful and relaxed personality traits (Bateson et al., 2013). Guilford (1957) stated that creative people are more sensitive to problems and have more habits than other people. Creative people especially have the characteristics of verbal and associative fluency. These people use the language well. Pala (1999), in addition, grouped creative personality traits into three groups:

Being open to experience: These people are open to new experiences and are aware of every moment they live. Every experience they have had stimulates their nervous system and are recorded as a new experience instead of the previously set category

Internal evaluation: Evaluating events with one's own foresight and creative mind, without being influenced by external stimuli.

Ability to play with elements and concepts: The ability to play with concepts, ideas, colors, shapes, and related objects.

Family: The role of the family is great in preparing the child for the future and raising her/him as a creative individual. The first steps of creativity are taken in the family environment where one lives and grows up. The more secure, comfortable, and democratic the family environment is, the more the individual's creativity skills are suitable for development. The child's feeling of comfort, freedom and security is an important factor in the development of creativity. Such a family environment gives the child self-confidence. The oppressive and critical attitude of the family towards the child prevents the development of the child's creativity. Allowing the child to express his/her feelings in the family, giving her/him responsibilities and accepting her/him as an individual are of great importance for the development of creativity (Harmanlı, 2002).

School/Education: Creativity is a way of living, a way of thinking. Everyone has different levels of creativity. The best environments for the development of creativity skills are obtained when school and family complement each other. Negative situations at school hinder the development of creativity in many ways. Not paying attention to individual differences between children, giving education to each child according to a common program at school prevents the development of children's creativity (Harmanlı, 2002). Allowing activities that will reveal the creativity of the child in the school environment improves the creativity of children. According to Piaget, the aim of education should be to prepare environments where students can invent and reveal new things, and to raise individuals who have the capacity to do new things (Resnick, 2017). For this reason, research-based teaching methods that encourage production should be used in the school environment. Thus, the creativity skill that everyone has at a certain level from birth can be developed to a certain level by using materials and teaching methods that support creativity in the school environment. In addition, the fact that the educational institution culture is supportive of creativity education also supports the emergence of creativity (Martins & Terblanche, 2003).

Activity corner

Please explain the factors that affect the development of creativity.

What do you suggest eliminating these factors?

Heredity and environment:

Birth order:

Gender:

Socio-Economic level:

Age:

Intelligence:

Personality:

Family:

School/Education:

Online sources:

<https://indiafreenotes.com/factors-influencing-creativity/>

<https://www.thehealthboard.com/what-factors-affect-creative-development-in-early-childhood.htm>

https://www.researchgate.net/publication/294104791_Positive_and_Negative_Factors_Involved_in_the_Development_of_Creativity_in_Children

<https://download.atlantis-press.com/article/25860540.pdf>

<https://dialnet.unirioja.es/descarga/articulo/8504313.pdf>

8 Factors promoting and preventing creativity

According to Torrance (2002), creativity better predicts academic achievement, intelligence, and academic ability in creative environments. Taylor et al. (1998), stated that creative behaviors affect social development as much as they affect scientific development. Everyone has the potential for creativity and can develop it to a certain level if desired (Harmanlı, 2002). Creativity is developed by guiding rather than being taught. For this, environments that allow creativity rich and diverse experiences should be designed. Developing children's imagination has an important place in the development of creativity skills. In addition, while having different lessons and activities, the child should be allowed to reach original solutions and should not be limited. In this direction, the solutions that the child put forward for the solution of the problem in different ways other than what is taught should be supported and encouraged (Önder, 2003). Furthermore, the following can be done to improve the creativity (Harmanlı, 2002):

- Avoiding being excessively oppressive and punitive in the classroom environment and creating more democratic environment.
- It should not be desired to imitate the sample model exactly.
- Avoiding criticism
- No pressure to put a product at the end of the event
- Giving the feeling that each product created has its own value
- Not to be mocked
- The child should not be interfered with too much.
- The child should not be overprotected.
- Providing an encouraging and reassuring learning environment that allows adults to act freely, without rules
- The child's interests should be determined
- Materials suitable for the child's abilities should be given.
- Activities that appeal to the five senses should be done.
- Achievements should be reinforced and rewarded.
- Any questions and ideas from the child should be valued and respected.

However various factors hinder creativity, whether consciously or unconsciously since childhood. Responding to what is different and not being adopted easily are important factors affecting creativity. These are:

1. Individual obstacles: Lack of self-confidence, fear of making mistakes and being criticized, being a perfectionist, inability to concentrate on a subject and work patiently for a long time, having problems with the sense of identity
2. Organizational barriers: Distrust of the superiors of the organization, authoritarian management, prior and constant criticism, individual insecurity.
3. Social obstacles: In society, daydreaming is seen as a waste of time. Believing that problems can be solved with a lot of money by following a systematic way. The game is for children only and cannot be used to solve the problem. Having the belief that there is only one correct solution to problems.
4. Cultural barriers: Daydreaming is a waste of time. Social values that vary from culture to culture, such as thinking that playing is only for children. Some cultural values support creativity, while others hinder it.
5. Perceptual barriers: Having difficulty in understanding the problem, narrowing, or widening the problem too much, inability to recognize terms, inability to see the relationships between concepts
6. Emotional barriers: Fear of making a fool of oneself or making mistakes, accepting the first point of view, anchoring for immediate success, distrust of other researchers, fear of control.
7. Learned barriers: Using things in a certain pattern and function, using previously known meanings, anticipating predicted possibilities,
8. Installed program barriers: A stack of programs and topics that are expected to be completed within a given period.

Activity corner

What do you think are the most important factors promoting the development of creativity? and why?

What do you think are the most important factors preventing the development of creativity? and why?

9 Conclusion

While creativity came to the fore initially only in the fields of arts and language, it is understood that it has become a concept which has been defined in all fields since the 1980s, after the research that defined the relationship between culture and intelligence, especially in the 1960s. In addition, while it was mostly associated with heredity in the early periods, today it is understood that environmental factors (family, nutrition, self-expression, education, etc.) are more important than heredity. Recent studies show that environmental factors are getting more important, and they bring some opportunities to develop creativity in all fields and bringing a new vision to the concept of creativity and research. Moreover, everyone has the potential to develop creative behaviors or practices in solving problems in their own life. For this reason, 21st century skills, including free and critical thinking skills, come to the fore through education systems. Training and educational programs and processes should be organized to develop these skills. These education programs should be application-oriented in terms of content and should prioritize their organization and implementation in a way that will improve students' creativity skills.

10 References

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References for Figures

Figure 1. Creativity; <https://www.nadeenschool.com/wp-content/uploads/2019/02/what-is-creativity.jpg>

Figure 2. Perception; <https://tr.pinterest.com/pin/238057530286663435/>

Figure 3. Creativity and Brain; <https://www.canstockphoto.com/brain-left-and-right-30978333.html>

Chapter 1.2

The Basic Principles of Entrepreneurship

Abstract:

Being able to exist in the rapidly increasing competitive environment of today's information age depends on the level of economic development of societies. In the development process of civilization, especially with the transition from the industrial society to the information society, entrepreneurship has gained great importance. It is an indispensable subject for the 21st century. For better understanding entrepreneurship, this section presents a general academic introduction to entrepreneurship for different levels of readers. In this context, entrepreneurship is defined, the related concepts with it are explained, its types and characteristics are explained in the section. Also, activity corners are presented at the end of each sub-section to ensure permanent learning. It is believed that this chapter will help readers to understand the basics of entrepreneurship more easily. So, it is recommended to follow the section carefully, and to carry out the activities and answer the questions sincerely.

Keywords:

Basics of entrepreneurship, entrepreneur, entrepreneurship, entrepreneurship typologies

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Chapter Structure:

1. Introduction
2. Literature on entrepreneurship
3. What is entrepreneurship?
4. Related concepts with entrepreneurship
5. Entrepreneurship types
6. Entrepreneurial characteristics
7. Your SWOT team: Finding your entrepreneurial power
8. Conclusion
9. References

1 Introduction

This section presents a general academic introduction to entrepreneurship for different levels of readers. In this context, a definition of entrepreneurship, related concepts with entrepreneurship, types of entrepreneurship and entrepreneurship characteristics are explained in the section through different sub-titles and activity corners. By reading and working through the activities and questions in this chapter, readers will be able to define and explain the basics principles of entrepreneurship through these concepts. This will aid your understanding of the subject and permanent retention of your learning.

2 Literature on entrepreneurship

Being able to exist in the rapidly increasing competitive environment of today's information age depends on the level of economic development of societies. In the development process of civilization, especially with the transition from the industrial society to the information society, entrepreneurship has gained great importance. Along with entrepreneurship, new and opportunistic ideas have been brought together with production factors and production has been realized. In parallel with production, wealth such as economic development, employment creation and social development has been gained, thereby increasing the welfare level of societies. The concept of entrepreneurship, which has a history as old as the history of humanity, has continued its journey up to the present day by gaining different features in different periods, and it has come up with completely different dimensions in today's information society (Askin, Nehir, Vural, 2011).

Entrepreneurship is part of both economic and social life. On one side, it is inevitable and a natural phenomenon for business organization. Healthy business organization is supported by the entrepreneurial ability adopted for changing and learning (Diandra & Azmy (2020). On the other side, it is also getting more and more important for society and education since rapid change advancement in science and technology are altering the structures of societies and job opportunities at a rapid pace. As known, the entrepreneurship value of individuals, a part of the society, is measured in economic and social terms in accordance with the lifelong learning policies of today's world (Gur-Erdogan, Eksioglu, Zafer-Gunes, Sezen-Gultekin, 2014). For this reason, it can be said that entrepreneurship is an important term for human life in terms of every perspective.

Based on this importance, this chapter focuses on the basics of entrepreneurship under the following sub-titles. So, the chapter aims to give its readers to define the main context of entrepreneurship.



Figure 1. Entrepreneurship, Source: <https://www.liveadmins.com/blog/6-essentials-of-entrepreneurship/>

3 What is entrepreneurship?

It is seen that there are many definitions on entrepreneurship in the literature. Taken in general terms, entrepreneurship as a concept is derived from the French word “entreprendre” which means “to initiate” In economic terms, it was first used in the 18th century by Richard Cantillon, who was a banker in Paris (Arikan, 2002; Aytac & Ilhan, 2009).

According to Hebert and Link (1988), Cantillon saw the entrepreneur as responsible for all exchange and circulation in the economy. As opposed to wage workers and landowners who both receive a certain/fixed income or rent, the entrepreneur earns an uncertain profit from the difference between a known buying and uncertain selling price. So, Cantillon’s entrepreneur is an arbitrageur, an individual that equilibrates supply and demand in the economy, and in this function bears risk or uncertainty (Iversen, Jørgensen, & Malchow-Møller, 2008:4).

After Cantillon, in the 20th century, the term entrepreneurship began to take place in sociology, psychology, economic theory and economic anthropology studies with Jean-Baptiste Say and Joseph Schumpeter (Arikan, 2002). Thus, it has been seen that the meaning of the term entrepreneurship changes over time according to the usage area.

McClelland (1961) defines it as a dynamic process created and managed by an individual who strives to exploit economic innovation to create new value in the market toward achieving a particular need. In this sense, Romer (1994) sees entrepreneurship as an engine room for economic growth and important indicator in the area of job creation, revenue generation, poverty alleviation and wealth creation (Adekiya & Ibrahim, 2016).

According to Paulose (2011: 18), entrepreneurship means starting a new business to make a profit, while an entrepreneur is a person who creates a new business with at least one paid employee, or a group of many. Smart and Conant (1994) defines entrepreneurship as a goal-oriented process whereby an individual identifies marketplace opportunities using creative thinking, secures resources, and adapts to the environment to achieve desired results while assuming some portion of the risk for the venture (Chelariu et al., 2008: 405). Praag (1999) also states that entrepreneurs are responsible for economic development by voicing and implementing ideas that will lead to innovation. When these new ideas are successfully implemented, new customer requests will be met and new businesses will emerge. In this way, these businesses will contribute to economic growth by providing employment opportunities to employees (Kaygisiz, 2015: 17).

According to another definition, entrepreneurship is associated with having production factors, organizing ability and risk-taking factors in order to produce economic goods or services with the aim of benefiting from the opportunities arising from environmental factors or to create new opportunities (Cetin, 1996). At this point, Schumpeter's (2004) definition comes into play.

Schumpeter (2004) defines an entrepreneur as an innovator who can create a new good, quality or method of production, can open a new market, can capture a new source of supply, or can form a new organization or industry. Ultimately, according to Bozkurt (2000), entrepreneurship is seen as having the ability to sense the opportunities created by the environment we live in, to produce dreams from those intuitions, to transform dreams into projects, to implement projects and to facilitate human life by producing wealth. In this direction, the three most basic resources that the entrepreneur uses while generating wealth appear as his own energy and power, the capital he can access and the people he has relations with.

From all these definitions, it is understood that entrepreneurship is a process that is put forward by individuals who respond to or create economic opportunities which create value for the individual and society and causes changes in the economic system with the innovations it brings (Cevik, 2006). For this reason, it would be more accurate to interpret it in terms of the field in which it is addressed, keeping the basic common points in mind to interpret the meaning of the concept of entrepreneurship.

Activity Corner

The graphic consists of two downward-pointing arrow shapes. The top one is orange and labeled 'Common points'. The bottom one is grey and labeled 'Your definition'. To the right of each arrow is a rounded rectangular box containing an instruction.

Common points

- Please write down the common points of the definitions of entrepreneurship.

Your definition

- Please write your own definition of entrepreneurship.

4 Related concepts with entrepreneurship

Since the concept of entrepreneurship has undergone semantic changes over time, it is seen that some other concepts are very close to the nature of entrepreneurship or are used instead of entrepreneurship. Looking at the literature, it has been observed that there are many concepts related to entrepreneurship and similar. Although it is possible to increase the number of these, some concepts are explained below.

Entrepreneur: Entrepreneurship as a concept was first used by the French economist Cantillon and gained its current meaning with J. Baptiste Say. Say defines entrepreneurship as a person who produces a good that is thought to be valuable by bringing all the production factors together and takes the risk for the profit he will gain (Binks & Vale, 1990; Efeoglu, 2014). Looking at the origin of the concept of entrepreneur, the Latin *in-trare* means “through the way” and the Greek *enteron* (in) means “intestine”. In French, it comes from the same root, *entre* “to enter”, *entree* means “entry”, *entreprenant* means “entrepreneur, dashing”, while in English *enter* “entrance”, *pre* “first”, *entrepre-neur* “first to enter, begin” income. The Arabic *enterprising* is derived from the *tesebbese meter*, which is derived from the root *se-bi-se*. *Attempt* means “to cling to something, to cling to something”. When we look at Turkish, it has changed from the root of *gir* to “*gir-is-me*” (Aykan, 2002: 4-5).

Employer-Boss: Persons who employ the workers mentally or physically in their own workplace and take responsibility because of this employment (Guney, 2008: 67). *Entrepreneur*, which is used with the same meaning as boss, employer in daily life, is a person who dreams, seeks, follows, and trades opportunities that other individuals may not realize, deals with unknowns and can take risks without hesitation (Karagoz, 2009). The boss can be an entrepreneur, or it can be used in place of the concepts of capital

ownership, employer or management (Muftuoglu & Durukan, 2004 cited by Bozkurt Cetinkaya, 2011).

Manager: A concept that is confused with entrepreneurship is management. Instead of the concept of entrepreneur, titles such as manager, factory manager and company manager are used. However, when we look at the essence of the concept of manager, we encounter the definition of “management is the person who does the work of the entrepreneur and receives a fee in return for these services before he becomes the owner of the business by making them a profession” (Kocel, 2005). The manager is the person who coordinates and manages the employees in order to achieve the goals set by the organization (Robbins & Coulter, 2007 cited by Bozkurt Cetinkaya, 2011). A manager is a person who bears responsibility in the organization, represents the organization, uses his authority on behalf of the organization, takes decisions about the organization, and has the right to use organizational resources (Oztas, 2017).

Investor: Investors are people who hold the capital they need to create a business. In other words, the person who owns the production tools necessary to produce goods and services is called an “investor”. The person who owns capital is the person who invests the capital he owns to make up for a deficiency in the society (Guney, 2008: 67). The investor refers to the capital necessary to establish a business, that is, to have the means of production necessary to produce goods and services (Arikan, 2004). It doesn’t actually mean ownership of money, but it is a concept used to express the means of production used for the production of goods and services. Entrepreneurship, unlike all these, is the person who takes risks constantly and evaluates business opportunities that others cannot see or dare (Muftuoglu & Durukan, 2004 cited by Bozkurt Cetinkaya, 2011). Thus, entrepreneurship and ownership of money must be strictly separated. Because the concept of enterprise evokes new products and production techniques, a broad vision or the ability to adapt to changing conditions rather than the existence of money. People who have entrepreneurial abilities but do not have sufficient capital are defined as potential entrepreneurs (Durukan, 2005 cited by Bozkurt Cetinkaya, 2011).

Merchant: A person who operates a business in his own name. It is also known as a merchant (Kucuk, 2010: 28).

Innovation: It is defined as the change, difference and innovation made in products, services, and business methods in order to create economic and social value (Elci, 2007).

Proactivity: It reflects the accuracy of the individual’s decisions, predictive ability, strong communication and an active intelligence (Pelenk, 2018).



Figure 2. Entrepreneurship concepts, Source: <https://medium.com/mba-mama-blog/5-things-entrepreneurs-should-know-before-starting-an-mba-9937c216fef4>

5 Entrepreneurship types

As seen in the literature, the nature of entrepreneurship has changed considerably over time, and entrepreneurship, which is supported by different theories, thoughts, and studies, has started to be discussed under many titles in terms of its types. When different studies are examined, it is seen that there are different classifications of entrepreneurship types. It can be observed that some of these classifications remain specific to the subject covered, while some of them have become a widely used species. For instance, *Morris and Kuratko (2020)*, *Filion and Dolabela (2007)*, *Brand, Wakkee and van der Veen (2007)*, *Marangoz (2012)* and many other researchers use the following different titles in their studies.

Morris and Kuratko (2020) defines four types of entrepreneurships in their study which are survival ventures, lifestyle ventures, managed growth ventures, and aggressive growth ventures. Survival venture describes an entrepreneurship that struggles to stay in business on a continuous basis, and it is the single largest category of start-up ventures. Lifestyle venture is the second most common form of start-up, and it include locally owned an operated business such as bar, day care center, etc. Managed growth ventures provides entrepreneurs to seek sustained growth and ongoing expansion of the business, but they also strive to achieve in a deliberate and controlled manner. Aggressive growth venture is often disruptive business that change markets, industries, societies, and, sometimes, the world by generating huge returns and risks to founders and investors.



Figure 3. Entrepreneurship types, Source: Najam, 2013

Filion and Dolabela (2007) mentions that there are some different types of entrepreneurs revealing different types of entrepreneurs based on values and contribution. For example, (i) egocentric values creates destructive entrepreneurs and their social contribution will be negative; (ii) egoistic values creates static entrepreneurs and their social contribution will be neutral; (iii) individualistic values creates efficient entrepreneurs and their social contribution will be positive; and (iv) collectivist values create humanitarian entrepreneurs, and their social contribution will be positive.

Brand, Wakkee and van der Veen (2007) suggest focusing on three different types of entrepreneurs to educate non-business students. The first one is start-up of new business courses which define entrepreneurship as a process, but narrow it down to the sources and discovering of the ideas and the process of opportunity evaluation, writing a business plan, managing growth, etc. The second one is pursuing opportunities courses which sees entrepreneurship as a process, and may take place in different context, only one of which is the business start-up. The third one is small business management courses which is more related to managing the existing firm and managing growth rather than concerning with the early stages of entrepreneurial process like the other two courses.

Barot (2015) states in his study that there are two different types of entrepreneurs. The first one is opportunity-based entrepreneurship in which an entrepreneur perceives a business opportunity and chooses to pursue this business as his active career. The second one is necessity-based entrepreneurship in which an entrepreneur has no other option to earn a living. This is not the choice but compulsion making him choose entrepreneurship as a career.

Aulet and Murray (2013) state in their study that there are two different types of entrepreneurs. First is innovation-driven entrepreneurship—the creation of “innovation-driven enterprises” (IDEs) that pursue global opportunities based on bringing to customers new innovations that have a clear competitive advantage and high growth potential. Second is small business entrepreneurship—the creation of “small and medium enterprises” (SME) which serves local markets with traditional, well-understood business ideas and limited competitive advantage.

Balli (2017) also examines different types of entrepreneurs in his study, and he presents the entrepreneurship typologies which have been put forward by many researchers in a single table as follows.

Table 1. Compilation of entrepreneur typologies

Researcher	Entrepreneur Typologies
Collins, Moore et al. (1964), Collins & Moore (1970)	“Ideal entrepreneur” and “Independent entrepreneur”
Laufer (1974)	“Manager or Innovative entrepreneur”, “Growth-oriented entrepreneur”, “Efficiency-seeking entrepreneur without growth-oriented” and “Artisan entrepreneur”
Smith (1976)	“Artisanal entrepreneur” and “Opportunistic entrepreneur”
Vesper (1980)	“Solo self-employed”, “Team builders”, “Independent innovators”, “Replicators of existing models”, “Exploiters of economies of scale”, “Capital collectors”, “Buyers”, “Trading artists”, “Holding founders” , “Stock investors” and “Value manipulators”
Julien and Marchesnay (1987)	“Entrepreneurs focused on continuity, independence and growth” and “Entrepreneurs focused on growth, autonomy and sustainability”
Lafuente and Salas (1989)	“Artisanal”, “Risk focused”, “Family focused” and “Management focused”
Hornaday (1990)	“Artisanal entrepreneur”, “Organizing entrepreneur” and “Professional manager”
Miner (1990)	“Entrepreneurial entrepreneur”, “Growth-oriented entrepreneur” and “Executive entrepreneur”
Chell, Haworth, Brearley (1991)	“Prototype entrepreneur”, “Semi-entrepreneur”, “Executive entrepreneur”
Woo and Cooper (1992)	“Inventive Entrepreneur”
Filion (1994)	“Executive entrepreneur” and “Visionary entrepreneur”
Siu (1995)	“Senior citizen”, “Workaholic”, “Living life”, “Idealist” and “High flying”

Isachsen (1996)	"Executive entrepreneur", "Tactical entrepreneur", "Strategist entrepreneur", "Idealist entrepreneur"
Miner (1996)	"Personal successful entrepreneur", "Super sales entrepreneur", "Real executive entrepreneur", "Expert idea creator entrepreneur"
Vesper (1999)	"Starter entrepreneur", "Achieving entrepreneur", "Obtainer entrepreneur", "Running entrepreneur", "Revisionist entrepreneur", "Innovative entrepreneur", "Supporting entrepreneur", "Intraentrepreneur entrepreneur", "Industry captain entrepreneur"
De Jorge Moreno, Catillo and Masere (2007)	"Privileged entrepreneur", "Distributed entrepreneur", "Skeptical entrepreneur", "Lazy entrepreneur", "Modern entrepreneur", "Untypical entrepreneur", "Traditional entrepreneur"

Source: Balli, 2017:155-156

As it is seen, the types of entrepreneurships are discussed under quite different headings in the literature. For this reason, it can be said that these titles can be detailed or increased based on the aim of studies. Supporting this idea, Marangoz (2012:11) states in his book that Entrepreneurship types are generally classified according to the way they are formed, emerged, operated, originality and organized. In the literature, the factors in this classification were intellectual, situational, operational, and organizational features. When evaluated in general, the types of entrepreneurships are discussed under the following headings.

Social entrepreneurship: It is a new concept in social terms although the concept of entrepreneurship is used in business and economy for long years (Sezen-Gultekin & Gur-Erdogan, 2016). Social entrepreneurship encompasses the activities and processes undertaken to discover, define, and exploit opportunities in order to enhance social wealth by creating new ventures or managing existing organizations in an innovative manner (Zahra et al., 2009).

Eco-entrepreneurship: It represents an important and understudied variant of the environmental movement that is oriented more toward leveraging neoliberal policies and market opportunities and less oriented toward radical protest against government and the private marketplace (Mars & Lounsbury, 2009).

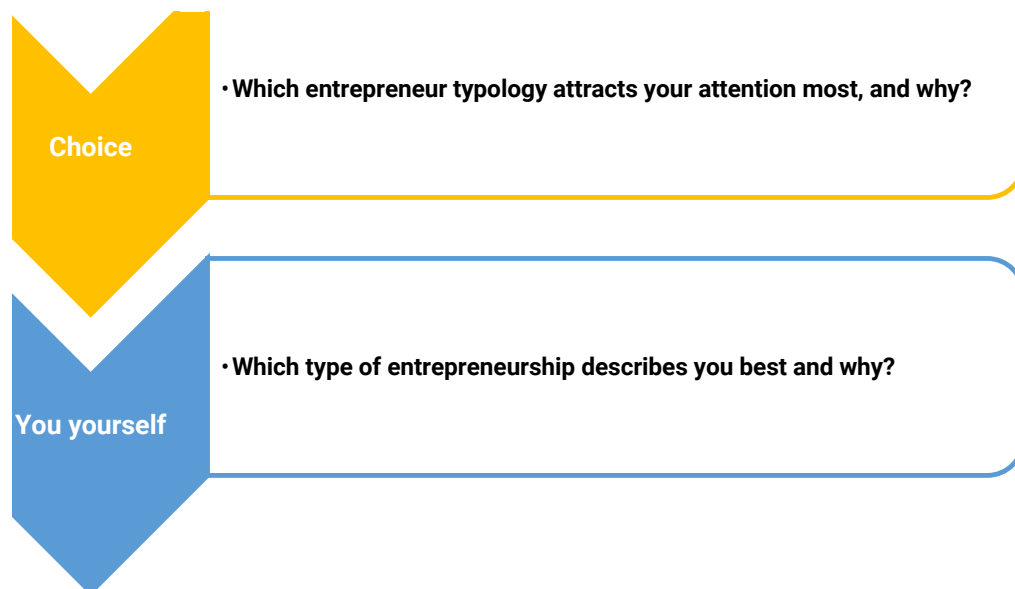
Corporate entrepreneurship: It is the concept of supporting employees to think and behave like entrepreneurs within the confines of an existing organizational structure. Employees with the right vision and skills are encouraged to identify opportunities and develop ideas which lead to innovative new products, services or even new lines of business (Kennedy, 2018).

Original Entrepreneurship: New entrepreneurship that independently establishes entre-

preneurship in its original form for the first time. They are startups that are established from scratch for the first time, and the first and original feature is the factor that makes this entrepreneurship specific and distinguishes it from others (Top, 2006 cited by Balli, 2017).

Professional Entrepreneurship: It means those choosing self-employment to join professional partnerships and establish a professional practice (Dawson, Henley & Latreille, 2009:14). Its compounded talents is not only the development direction of innovation entrepreneurship education; it is also the goal of transforming professional education into closer integration with reality and serving the society (Liu et al., 2021).

Activity Corner



6 Entrepreneurial characteristics

Since its nature is too broad, it is nearly hard to define the exact features which an entrepreneur should have. In the literature, there are many suggestions on how to be an entrepreneur. Some of these suggestions are superficial or narrow-scoped, while some of them are omnibus and clear. Hence, it is possible to say that readers can come across very different entrepreneurial characteristics in the studies. The following lines present some general characteristics for an entrepreneur presented by different researchers.

When evaluated from a general perspective, Abu-Saifan (2012) states that common characteristics of an entrepreneur are being an innovator, dedicated, initiative taker, leader,

opportunity alert, persistent, and committed. However, from an economic perspective these characteristics can change. Abu-Saifan (2012) examines different studies on entrepreneurship and presents core characteristics of an entrepreneur as table in his study. It is stated in the study that these characteristics highlight the economist’s view of an entrepreneur as an individual with an exceptional mind-set; individuals with such a mind-set are seen as key to venture growth maximization and economic prosperity.

Table 2. Core characteristics of an entrepreneur

Source	Definition	Core Characteristics
Schumpeter (1934) tinyurl.com/6mqfkr0	An entrepreneur is an innovator who implements entrepreneurial change within markets, where entrepreneurial change has five manifestations: 1) the introduction of a new/improved good; 2) the introduction of a new method of production; 3) the opening of a new market; 4) the exploitation of a new source of supply; and 5) the carrying out of the new organization of any industry	<ul style="list-style-type: none"> • Innovator
McClelland (1961) tinyurl.com/6nsgtpd	The entrepreneur is a person with a high need for achievement. This need for achievement is directly related to the process of entrepreneurship [...] Entrepreneur is an energetic moderate risk taker.	<ul style="list-style-type: none"> • High achiever • Risk bearer • Dedicated
Kirzner (1978) tinyurl.com/87mbxax	The entrepreneur recognizes and acts upon market opportunities. The entrepreneur is essentially an arbitrageur.	<ul style="list-style-type: none"> • Arbitrageur
Shapero (1975) tinyurl.com/8xcuvj8	Entrepreneurs take initiative, organize some social and economic mechanisms and accept risks of failure.	<ul style="list-style-type: none"> • Organizer • Initiative taker
Carland et al. (1984) tinyurl.com/7xa9s7f	The entrepreneur is characterised principally by innovative behaviour and will employ strategic management practices in the business.	<ul style="list-style-type: none"> • Strategic thinker
Kao and Stevenson (1985) tinyurl.com/6wcq6su	Entrepreneurship is an attempt to create value through recognition of business opportunities.	<ul style="list-style-type: none"> • Value creator • Opportunity aware
Timmons and Spinelli (2008) tinyurl.com/7sfqdh2	Entrepreneurship is a way of thinking, reasoning, and acting that is opportunity obsessed, holistic in approach and leadership balanced.	<ul style="list-style-type: none"> • Leader • Holistic • Persistent • Committed

Source: Abu-Saifan, 2012:23

With a different perspective, Mohanty (2017:4) states in his book that entrepreneurs should need to achieve, be independent, bear risks, have locus of control, be perseverant, and have positive self-concept to be successful. The following lines explain the details about these characteristic features.

Need to achieve: having a strong desire to achieve goals

Independence: preferring to be their own boss and wanting to be responsible for their own decisions.

Risk-bearing: taking decisions under uncertainty and being willing to take risk, but never gambling with the results.

Locus of control: believing to be able to control the consequences, to govern and to shape their own destiny.

Perseverance: having the quality of sticking to the job they decide to undertake and working sincerely until the whole project is successfully implemented.

Positive self-concept: being always positive in their actions, being an achiever, directing their fantasies and dreams towards achievement of worthwhile goals.

According to the Turkish Republic Ministry of National Education (MEB, 2019), when the successful entrepreneurship examples of today are examined, it is seen that they have the following characteristics.

Accurately Identifying Opportunities: Successful entrepreneurs can accurately see opportunities created by the environment.

Making the Right Decisions: Successful entrepreneurs are known for making the right decisions on time.

Making the Right Feasibility Study (Feasibility Study) Before Investment: Successful entrepreneurs conduct a feasibility study or have it done by experts before implementing their project ideas.

Successful Management and Organization: In successful entrepreneurship examples, it is seen that entrepreneurs are successful planners, implementers and supervisors.

Maintaining Sufficient Capital: Capital is one of the main sources of business life. Providing appropriate and sufficient capital for the work to be done is one of the basic characteristics of successful entrepreneurship.

Proximity to Financial Sources: Entrepreneurs may sometimes need to find additional sources of finance in business activities. Successful entrepreneurs are always closer to their sources of finance.

Constructive Competition: Constructive competition, which triggers continuous improvement and development, is one of the necessary factors for successful entrepreneurship.

Profitability of the Investment Area: Having the profit potential of the invested area in entrepreneurship is one of the basic conditions of being successful in the sector. In a profitable field, the enterprise can be successfully sustained.

Low Uncertainties: Successful entrepreneurship has low uncertainty. In an environment of uncertainty, business activities fail in the long run.

Teamwork: Team spirit is important for entrepreneurs to be successful.

Hisrich and Peters (1973) describe the personal characteristics that “successful entrepreneurs” should have in their books as follows (cited by Yilmaz & Sunbul, 2009).

- Creative thinking skills
- Desire to work at a high level
- Courage, passion, and determination
- Ability to interact with people at a high level,
- Ability to express himself orally and in writing,
- Loving his job and job motivation,
- A rich subconscious and imagination,
- Predisposition to team and teamwork,
- Having a personal vision and mission,
- Being open and willing to change, transformation,
- Ability to act with flexible tolerance,
- Sincere, reliable, sympathetic and humorous personality,
- Having high ability to convince and persuade people,
- Management and leadership skills,
- Desire and excitement to complete work,
- Foresight and the habit of seizing opportunities

Similarly, according to Dogan (2015), “the characteristics of the entrepreneur” are as follows:

- Having organizational skills
- Evaluation of idle resources
- Taking risks
- Ability to see and evaluate opportunities
- Being dynamic rather than doing prudent research
- Value creation
- Rewrite the rules of the game

As it is seen, Mohanty (2017) and MEB (2019) present different characteristic features under some sub-titles, and Hisrich and Peters (1973) and Dogan (2015) show some other features item by item while Abu-Saifan (2012) presents these features as compilation. As much as these features are suggested by different researchers, some are common and iterant. For this reason, it is reminded that all the above characteristics features for an entrepreneur can be extended based on different studies, titles, or items.



Figure 4. Entrepreneur, Source: <https://kabarindah.com/inilah-pengertian-entrepreneur-menurut-pendapat-6-ahli-terkemuka>

Activity Corner

The most	<ul style="list-style-type: none"> • Who is the most entrepreneurial person you know? Describe his/her characteristics based on those in this section.
You yourself	<ul style="list-style-type: none"> • Can you describe yourself as an entrepreneur? If so, please choose three characteristics the most relevant to you, and explain the reason why.
SWOT	<ul style="list-style-type: none"> • Please evaluate yourself in terms of being an entrepreneur. Go deep and analyze your situation. Make your own detailed personal SWOT analysis. SWOT stands for Strengths, Weaknesses, Opportunities, and Threats. This analysis will help you define and find your entrepreneurial power. Fill in the table below.

7 Your SWOT team: Finding your entrepreneurial power

Please evaluate yourself in terms of being an entrepreneur. Use the concepts and characteristics from this chapter to think deeply and analyze your situation in detail, by making your personal SWOT analysis. SWOT stands for Strengths, Weaknesses, Opportunities, and Threats. This analysis will help you define and find your entrepreneurial power. For this, fill in the table below.

<p>STRENGTHS</p> <p>What are your strengths for being an entrepreneur?</p> <p>Which characteristics do you have to sustain your strengths?</p> <p>What do you do better than others?</p> <p>How do others define your strengths?</p>	<p>OPPORTUNITIES</p> <p>What sort of trends impact you positively to become an entrepreneur?</p> <p>What types of opportunities do you have to become an entrepreneur?</p>
<p>WEAKNESSES</p> <p>What are your weaknesses in terms of being an entrepreneur?</p> <p>What do others do better than you?</p>	<p>THREATS</p> <p>What sort of trends impact you negatively in terms of being an entrepreneur?</p> <p>What types of threats are there that prevent you being an entrepreneur?</p>

8 Conclusion

Entrepreneurship is a fundamental aspect of our economy that is driven by individuals who possess a set of key principles. These principles include creativity, risk-taking, innovation, leadership, perseverance, and adaptability. By adhering to these fundamental principles, aspiring entrepreneurs can cultivate the skills and mindset required to succeed in today's competitive marketplace. Entrepreneurship, on the other hand, is not for everyone, and it requires a great deal of hard work, dedication, and resilience. Those who choose this path should expect challenges and setbacks, but with the right mindset and a willingness to learn from failures, they can achieve great success.

Research has shown that the most successful entrepreneurs are those who are able to develop and maintain a strong network of relationships (Aldrich & Martinez, 2001), while also possessing a high level of passion and determination (Cardon et al., 2005). They must be able to recognize and pursue opportunities, be resilient in the face of failure, and to have a strong sense of self-efficacy (Gupta & Turban, 2019). While entrepreneurship is not easy, for those who are willing to put in the effort and embrace the entrepreneurial mindset, it can be a rewarding and fulfilling journey.

Unlike traditional entrepreneurship, which often focuses on identifying and exploiting opportunities, "contextual entrepreneurship" adopts a more nuanced approach in an effort to understand the unique challenges and opportunities of a specific social, cultural, or economic context and create solutions that are well-suited to that environment.

Contextual entrepreneurship acknowledges that each community is unique, and that what works in one place may not work in another. By taking into account the local context, including cultural norms, social structures, and economic conditions, contextual entrepreneurs are better able to identify unmet needs and develop products or services that are more likely to be adopted and sustained over the long-term. Contextual entrepreneurs should also look for opportunities to create value by meeting unmet needs in the local community, build strong relationships with stakeholders in their community, remain flexible and adaptable, be adaptable and innovative in order to succeed.

This chapter presents basics of entrepreneurship through different sub-titles and activity corners. These titles are the conceptual definitions, different types, characteristics of entrepreneurship, while activity corners include different questions and tasks. The chapter aims to provide different level of readers and researchers with an academic introduction to the nature of entrepreneurship through these titles and activity corners.

When the concept of entrepreneurship and its sub-headings are examined, it is seen that it appears in different forms in many sources. For this reason, entrepreneurship has a feature of being a concept terminologically redefined by too many researchers. When the definitions are considered in terms of genres and features, it is seen that the research present the necessary information in different classifications, sometimes superficially and sometimes in depth, according to their subject integrity and purpose.

However, despite such differences, the common point of all studies reveals the fact that the concept of entrepreneurship does not have a sharp line and can be revised according to the field in which it is addressed. The basis of this reality stems from the fact that entrepreneurship is such an essential issue that it cannot lose its importance and maintains its currency in every period. For this reason, researchers and readers are expected to contribute to the literature from different perspectives by addressing entrepreneurship from its very foundation, adding different interpretations, and making additions to it.

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Chapter 1.3

Understanding human creativity through biology, genetics and culture

Abstract:

The origin and development of creativity in human beings is one of the issues that disciplines such as Psychology, Biology, Health Sciences, Arts, or Educational Sciences have addressed in recent decades. Genomic advancement and increased knowledge of neural networks and their plasticity is providing pedagogues and educators with very valuable information for the development of new teaching methods that favour the development of creativity as an important part of the entrepreneurship process. The fast development of artificial intelligence and machine learning are proposing new interdisciplinary models to educate new generations in creativity and entrepreneurship. In this chapter we will address the ultimate advances in genetics and some examples about the influence of culture in the development of creativity in humans, as core elements of the future development of creativity in different frameworks: formal, non-formal education, and even informal education. We also present some current examples of this pedagogical development that could be used in different educational levels.

Keywords:

Genetics; Creativity; Culture; Entrepreneurship Education

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1 Introduction and purpose of the chapter

It is common nowadays to hear or read about the need to develop creativity at school, because it has been neglected in past decades and because it is very important for the integral development of students. Thus, we seem to be moving from an education in which creativity was not promoted and from which creative people were excluded, to one in which creativity, together with other mantras such as sustainability, climate change or gender perspective, will replace an education system loaded with too much content, in which everyone will be creative.

But is this really like this? What are the roots of human creativity? Can it develop in a “vacuum” or does it require associated content? Can all students develop high levels of creativity? Can we apply specific models and strategies for the development of creativity? If we can look deeper into these questions, we will be better prepared to teach our students to be more creative and to use this creativity in everyday life to solve academic, everyday or - in the future - professional problems.

What we present in this chapter is a series of arguments about the origin and function of creativity in human beings, which help us to understand why it is important to develop it at school:

1. Begins with an approach to clear and simple definitions of creativity as a skill or competence, in order to situate the reader in our academic perspective.
2. We then show some evidence of the deep evolutionary roots of creativity, and then point out how human social skills allow us to push the boundaries of creativity and use it for problem solving.
3. Thirdly, evidence is provided that shows the ability of human beings to improve their creativity-related skills through social learning.

2 How can we define creativity?

Creativity is often defined as “The ability to produce work that is novel and appropriate” (Kanlı, 2020: 125). It is not the only one, nor the most complex, but for the purpose of this chapter it is interesting and is complemented by a recent definition of creativity which, in the framework of entrepreneurship education, describes it as “an individual’s ability to use imagination, explore multiple solutions and determine innovative responses to problems” (Ekici *et al.*, 2017; Ibáñez Cubillas and Gijón Puerta, 2021).

This definition is framed within a competence-based training model. Creativity is recognised as one of the skills for the XXI century (Ekici *et al.*, 2017), we can think of a competence as the individual’s ability to perform tasks or solve problems in complex

contexts, mobilizing all kinds of resources (cognitive, personal and social), but there are many perspectives from which the concept of creativity can be approached: biological, psychological, psychometric, emotional, cognitive or entrepreneurial, among others. Some of them put more emphasis on biological or evolutionary aspects (phylogenetic and ontogenetic) and others on cultural aspects, but we firmly believe that, in species like the human species, with such a high capacity - and need - for social learning, the biological basis is modulated by social learning, that is, by the culture that each human group develops and that differentiates it from other groups in its shared values and knowledge (Gijón Puerta, 2006). This has also been evidenced in the study of individual variations in non-human animals (Sol, Griffin and Bartomeus, 2012).

Indeed, in everyday life, we can recognise with some ease those people we consider creative - or more creative - from those who are not. By observing their behaviour, their response to problems or challenges, their way of performing simple and complex tasks, we intuitively describe them as more or less creative. Two examples can be seen in the sports world:

Miguel de la Quadra-Salcedo(1932-2016), Spanish javelin thrower, used a new technique incorporated by the Basque Felix Erausquin (1907-1987), master of the shot put and discus, who took the throwing technique from the sport of the “Basque bar”, which consisted of launching through a rotation and not with an approach run. De la quadra In 1956, at the Olympic Games in Rome, de la Quadra-Salcedo popularized the javelin throw with a spinning style. “The Spanish bomb that causes terror”, as the French newspaper L’Équipe wrote. In this way, he threw an incredible 112.30 meters, beating the world record of the time by 30 meters. And a distance that has never been reached to this day. However, the International Athletics Federation did not recognize this record and banned this style.

Dick Fosbury, American high-jumper, revolutionised the high jump forever at the 1968 Olympic Games in Mexico. He stunned everyone by being the first to jump backwards. He won gold and retired at the age of 21. Since then, there has been no other way of jumping, as this jumping technique has been accepted as valid and has been called the ‘Fosbury Flop’ ever since.

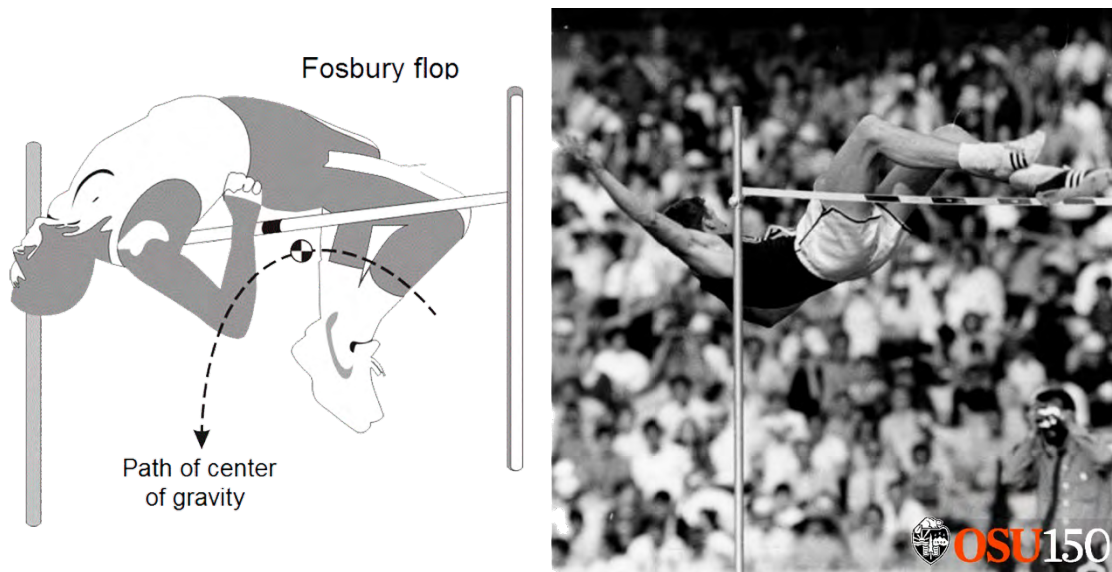


Figure 1. Fosbury flop (left), image showing path of center of gravity in the Fosbury Flop and Dick Fosbury (right) trying to improve scores using creative techniques in High jump.

And these “creative” differences can be observed from a very early age, when creativity can manifest itself differently than in adolescence, adulthood, or old age (Restrepo, Arias-Castro and López-Fernández, 2019) and also in each individual, which has been described with genetic evidence, through classical methods such as the Twin Method (consists of a comparison of the level of creativity or whatever you want to analyse between twins, brother and sisters, cousins, and other people with different degrees of kingship; if creativity is higher in twins than in siblings, and higher in brothers than in cousins, etc., we can conclude that there is a big genetic component in creativity) or, more recently, with Molecular Genetics techniques (Spinath and Johnson, 2011). We can perform genetic analyses on highly creative people, trying to find common genes that can explain behaviours associated with creativity.

But it is no less true that different human groups (what we can call different societies) recognise and promote creativity and entrepreneurship to a greater or lesser degree, ultimately facilitating the creation of new enterprises and respecting at different levels the entrepreneurial career as the ultimate purpose of the creative individual. For example, the data collected in the last report Global Entrepreneurship Monitor (GEM) 2018 / 2019 (Hart *et al.*, 2020), on recognition of creators and entrepreneurs. The evidence presented in this chapter supports the genetic basis of creativity, modulated by social learning (culture).

Thus, like any behaviour or activity carried out by human beings, creativity has a biological component -genetic and neural connectivity- (Dastan, Calmasur and Turkez, 2016), a family and neighbourhood component (Lindquist *et al.*, 2016) and a social learning

component - formal, non-formal or informal - (Hwang and Lee, 2016). In our case, as those responsible for the initial training of educators, our ultimate interest is in the possibility of teaching and learning creativity and entrepreneurship and how to approach the training of educators for this purpose (Bischoff et al., 2018; Ibáñez Cubillas & Gijón Puerta, 2021.; Paños Castro, 2017).

3 Genetics: does creativity have an evolutionary origin in human beings?

Natural selection is an evolutionary process that was described by Charles Darwin in his book *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life*. Natural selection was proposed by Darwin as the mechanism that explains biological evolution. This explanation is based on three premises: the first one is that the trait subject to selection must be heritable; the second holds that there must be variability of the trait among the individuals of a population; and the third premise states that the variability of the trait must give rise to differences in survival or reproductive success, causing some newly appearing characteristics to spread in the population. The accumulation of these changes throughout the generations would produce all the evolutionary phenomena. The evolutionary perspective of creativity, derived from Charles Darwin's theory of evolution by natural selection (Darwin, 1859, 1871) and its development from paleontological, genetic and, more recently, molecular genetic evidence (Ellis, 2016), is essential to understand the power that this concept has in the course of human life. It is not only to establish that there is a genetic basis for creativity, and that it is modulated by culture, but also to establish that creativity is deeply rooted in human beings because it is an evolutionary inheritance that appeared in earlier periods of life on Earth.

While there are complex behaviours in the animal world that are stereotyped, others show individual variations in their execution, and it is precisely these variations that in many cases define greater survival and fitness. And some of these individual variations may be due to creative processes. As an example of the first type - stereotyped behaviours - we can talk about the mating of praying mantis, which ends with the death of the male, and which does not present "creative" variations. Among the behaviours of the second type - which do present creative variations - we can cite the nuptial dance of some birds which, generally reserved for the males of the species, allow the female to select the best males, through an "honest" characteristic which, in this case, presents creative variations (Crisanto Téllez, Tellez and Gabriela, 2016; Gallego Rubalcaba, 2017). Thus, an individual characteristic that is related to fitness - bridal dancing - can be modulated by more or less creativity, which we can now also link to fitness.

So we can think that, in the course of evolution, creativity has been favoured by natural selection, with reproductive groups shifting towards greater freedom in decision-making and problem-solving. There is, in fact, a great deal of evidence on creative processes in animals, being very interesting their link with other aspects of behaviour such as boredom and curiosity, as presented in a recent review (Lilley, Kuczaj and Yeater, 2017) which we will use as a plot line. In relation to creativity and curiosity, Gosling (2001) reintroduced the concept of animal personality in scientific studies on non-human animals, compiling individual differences in personality in several species.

Giving importance to boredom and the ability to re-engage its attention, Eastwood et al. (2012) have documented behaviours that are undoubtedly the result of curiosity, including creativity, problem-solving, play and social interaction. In this sense, Bench & Lench (2013) have argued the adaptive importance of boredom, because it motivates the individual to let new thoughts or stimuli attract their attention. Boredom has also been linked in recent studies with humans to increased creativity (Mann and Cadman, 2014) and has been associated in non-human animals with interest in new activities, when environments are prepared that enrich interaction and allow for “creative” activities in captivity, reducing levels of stress-related hormones and also the amount of stereotyped behaviours, as evidenced in studies by Owen et al. (2005) in giant pandas (*Ailuropoda melanoleuca*) or by (Cannon et al., 2016) in macaque monkeys (*Maccaca sp.*). We find in these findings already the need for enriched and stimulating learning environments, which will be so important for human beings and for the development of educational systems since the French Revolution.

A recent review by Lilley et al (2017) analyses individual differences in different aspects related to creativity, play and problem-solving, such as the flexibility and adaptability in feeding strategies observed in captive killer whales (*Orcinus orca*) when capturing seagulls (Baird, 2000; Lilley, Kuczaj and Yeater, 2017), or the shyness - audacity, directly related to creativity (more creative animals tend to be more curious and audacious). Play has also been the subject of numerous studies in humans and non-human animals, although its evolutionary and adaptive origin and its relationships with other aspects such as boredom are not yet clearly determined. Burghardt (2014) has proposed that play may reduce boredom and stress, acting as a counterbalance to lack of stimulation, and also that it may be a reducer of excessive metabolic energy, helping to maintain optimal cognitive and physical fitness.

Play, from its evolutionary roots, is linked to the personality of each individual, which influences both the preference to use objects or establish social links, which are often part of games and could be the stimulus a person seeks when bored. These situations have been clearly described in studies carried out in dolphins by different authors

(Greene, Melillo-Sweeting and Dudzinski, 2011; Kuczaj and Eskelinen, 2014), who show that each individual has preferences in the choice of playmates, and differences in the level of peer search or in the type of objects selected for playing and in the frequency of play.

J. C. Kaufman, who worked with aquarium-trained dolphins in the 1960s, at that time there were no restrictions on the capture of dolphins for aquaria and shows, so there were large numbers of dolphins in captivity or semi-freedom, in aquaria and aquatic facilities. Kaufman

describes how Pacific bottlenose dolphins (*Tursiops gilli*) exhibit spontaneous creativity in their interactions with visitors:

...developed games, such as greeting people not by popping their heads out of the water but by turning upside down and laying their tails on the rim of the tank, a disconcerting sight to guests. They also developed a game of coming out of the water and balancing on the top of the waist-high tank wall, tails in the air. Now and then, one fell out, a nuisance because (i) they could get hurt and (ii) they are heavy, and it took a stretcher and three or four people to hoist them back in (Kaufman, 2015: 483).

Likewise, Kaufman (2015) refers to the creative and playful use of a pair of Rough-toothed dolphins (*Steno brendanensis*), which were to be moved to an alternative tank because their tank was being cleaned, for which a net was set up to catch them, as it was not common for dolphins to voluntarily change tanks in the aquarium: however, they started a game consisting of one lifting the net for the other to pass underneath, which they did several times in both directions, until they finally swam together to the new tank. Finally, also regarding dolphins, (Pryor, 2015) indicates that creative individual differences are observed, for example, in behaviours for catching small tuna while avoiding being caught in boat nets, and that these differences can be highly creative.

The pile of evidence on the presence of curiosity, creativity and problem solving in non-human animals allows us to affirm that creativity is deeply rooted in humans, who have evolved towards greater development of the central nervous system and greater complexity in social relationships and social learning. And this increased knowledge about creativity in humans and non-human animals has greatly influenced the way we view and observe both humans and non-human animals. As an example, the evolution of training systems for animals, including dogs - especially service dogs - has moved from traditional correction-based methods to modern marker-based training, - "event marker, reinforcement, shaping, discriminative stimuli or cues, and absence of correction and punishment"- (Pryor and Ramirez, 2014). It can also help us to understand creative processes and their training in human beings, both from the point of view of formal teaching and non-formal and informal learning.

4 Can creativity be learned and taught? Adapting Creativity to Human Culture

Over the last 60,000 years, humans have expanded their presence in most places on the planet, which is often explained in terms of their cognitive abilities, i.e. the enormous development of their brain, especially the neocortex (See Figure 2). Thus, humans, with greater capacities for analysis and neural response than other animals, have been able to extend their presence to a very wide range of environments.

But it is clear that human success has not been based solely on this brain development at the individual level, but on the fact that this development has allowed us to learn from others and to pass on this learning from generation to generation. “This capacity enables humans to gradually accumulate information across generations and develop well-adapted tools, beliefs, and practices that are too complex for any single individual to invent during their lifetime” (Boyd, Richerson and Henrich, 2011).

And of these skills, one of the most interesting is the ability to respond to problems with novel solutions, i.e., to be creative. This skill has a strong relationship with social learning because, in addition to genetic variability and natural heritable differences in neural plasticity and the genes involved in creativity, social learning is deeply rooted in the human species, as we have already indicated. In short, we can say that creative thinking plays a vital role in almost every aspect of human life, but that little is known about the neural and genetic mechanisms underlying creative thinking.

On the genetic basis of creativity in humans, some very recent studies present us with important evidence on the subject. Although it is not possible to speak of a “creativity gene”, given the complexity of this human ability, progress is being made in the recognition of a broad set of genes involved in behaviours and skills and resources -cognitive and non-cognitive- related to creativity (Barbot and Eff, 2019). Here are some examples of recent studies on the subject:

BRAIN SIZE AND NEURON COUNT

Cerebral cortex: mass and neuron count for various mammals

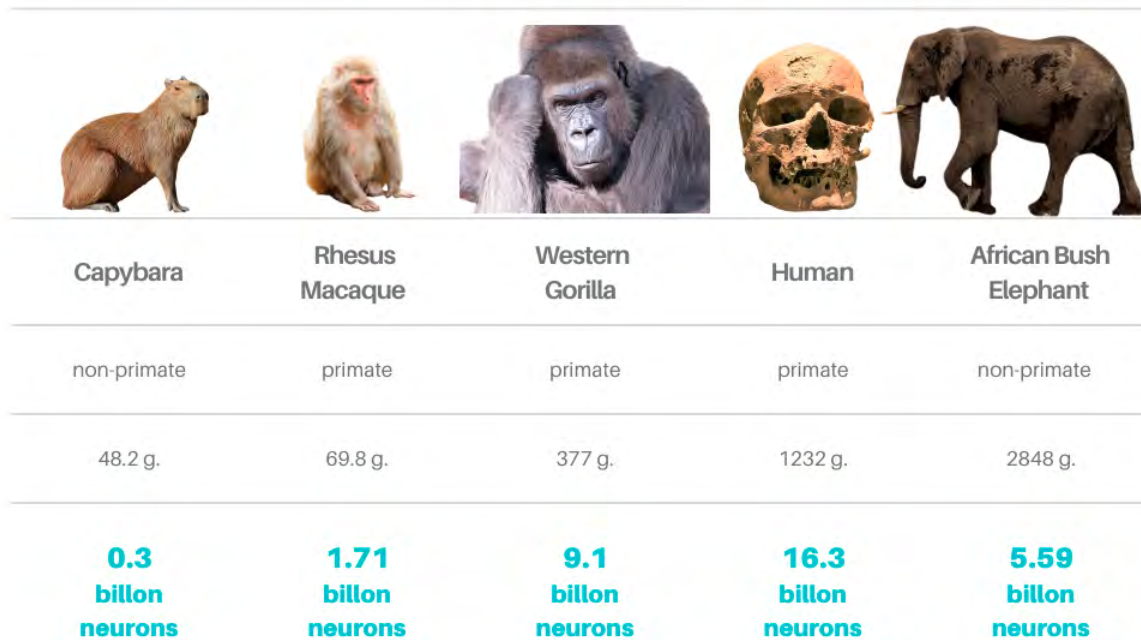


Figure 2. Brain size and neuron count in different species (adapted from Jabr, 2015)

Research by Zwir et al. (2021) has described gene networks related to the personality and the reactivity, self-control, and self-awareness and compared them to chimpanzees and Neanderthals, finding that Neanderthals had almost the same genes for emotional reactivity as chimpanzees, and were intermediate between modern humans and chimpanzees in the number of genes for both self-control and self-awareness, and had 200 unique genes regulating a large set of protein-coding genes related to self-awareness, creativity, and prosocial behaviour that were not found in chimpanzees or Neanderthals. But we are still far from knowing in depth the genetic relationships of creativity in humans.

Kandler et al. (2016), in a classic study with two sets of twins, examined the structure and sources of individual differences in creativity in two aspects: perceived creativity and performance on creative tests. Through confirmatory factor analysis -CFA- through this factor, relationships between perceived creativity (which was linked to openness to experience and extraversion), while performance on creative tests was associated with intelligence and openness to experience. Multivariate behavioural genetic analysis indicated that the heritability of creativity could be explained by the genetic component of intelligence and openness. A main source of individual differences in creativity was

due to environmental influences. The relationship between genetics and environmental conditions (social conditions in the case of humans) and the interaction between the two elements appears again in this study.

One of the most interesting works on the genetic and functional basis of creativity has been the impressive study by Liu et al. (2018) which provides the first in-depth data on the genetic and neural basis of creativity. The study, conducted on 236 subjects, uses the Torrance Tests of Creative Thinking score (Qian and Plucker, 2021) to cross-validate it with the whole brain connectome (34,716 functional connectivities) through neuro-imaging analysis, and whole genome data (309,996 SNP - Single-nucleotide polymorphism-). By combining the connectome with genomic data, they were able to predict people's creativity scores with an accuracy of 78.4%.

5 Individual creativity interacting with social learning: The monkeys of Koshima

To conclude, we should remember that learning by imitation, by listening or by exchanging ideas, which generates differences between human groups, occurs in all cultures and has been observed throughout history, and is therefore based on an evolutionary development of creativity already present in animal species with a broad social life.

Although we could cite many, there is one case that perfectly documents how individual creativity interacts with social learning, which in turn modulates individual behaviours. And we have a case that documents from the beginning a creative behaviour that becomes cultural in non-humans, and is transmitted in the form of social learning through the generations: that of the macaques on the island of Koshima. Japan's religious traditions bring thousands of people to places like Koshima to make offerings of food to the animals that live there (in this case two groups of macaques). These macaques have the behavior of washing sweet potatoes (*Ipomoea batata*) before eating them (Kawai, 1965; Leca *et al.*, 2016; Schofield *et al.*, 2018), recently retold by M. Llorente in the Science blog (Llorente, 2015), whose account is summarised here:

... Koshima is a small island in Miyakazi Prefecture (Japan)... It is home of a hundred *Macaca fuscata*, divided into two troops - extended family groups...

It was not until December 1948 that three of the great fathers of primatology, Kinji Imanishi, Junichro Itani and Shunzo Kawamura of Kyoto University, began a systematic longitudinal study with the monkey troops... [along with students such as] Satsue Mito, a young elementary school teacher who helped the researchers by providing supplies...

... One day in September 1953, Mito observed a young female called Imo doing something unusual: washing a sweet potato in the water of a stream. The news reached Kyoto Uni-

versity, which immediately turned its attention to this behaviour and began to monitor it over time. Twelve years after this first observation, an article was published in the Japanese journal *Primates* about this cultural behaviour (Kawai, 1965) ...

... It was documented that a non-human species had been able to develop a cultural type of behaviour and tradition ...

... The washing of ipomoea batatas fulfilled three of the basic requirements to be considered a "culture": it had emerged, it had spread and it had been modified. Imo was the first individual to perform this behaviour (emergency). The new behaviour spread over the years throughout the island through two main channels: family and playmates. Imo's mother and siblings copied his behaviour. So did Imo's friends. Eventually, the ipomoea batatas went from being washed in streams to being washed in the sea (modification). In this way, in addition to cleaning the potato, a saltier and more pleasant taste for the animals was obtained...

...What these little monkeys taught us from that moment on is that culture is not the exclusive property of human beings. Our understanding of the genesis and the cultural evolution in humans must and needs a comparative study with those biological species with which we share the most. Fortunately ... the evidence for cultural behaviours and traditions in multiple species of non-human primates is enormous. Our culture - material and non-material - arose long before humans set foot on Earth. Our material and non-material culture is common with other non-human primate species and non-primate animals....

(Llorente, 2015)

6 Some concluding remarks about creativity

In this chapter, we present Creativity as a human ability which has a genetic basis, it is modulated through social learning – culture, and can be trained in informal, non-formal and, of course, formal learning. But some issues need to be considered, to avoid creative enthusiasm leading us to unrealistic situations for the holistic development of students and the professional development of teachers.

Firstly, the intrinsic genetic variability in human beings, which manifests itself in phenotypic diversity (physical, cognitive, psychological and skill development diversity) indicates that not everyone will be creative, or at least will not be able to achieve the same levels of creativity. Phenotype is the set of observable characteristics of an individual resulting from the interaction of its genotype - the genetic constitution of an individual organism- with the environment (e.g. genetics determine the size of individuals, but their growth will determinate the final size by feed, climate, diseases, etc.). For this reason, the development of creativity cannot be standardised or serve to classify people, as has been done in the past with the use of the intelligence quotient (IQ), but it should

be a means of developing the student as a whole, respecting these differences and not imposing standards that limit their transition through the educational system, taking advantage of the existence of the model of multiple intelligences developed by Gardner (1983) as a theoretical reference.

This is also valid for teachers, as they also show diversity in their levels of creativity, applied in this case to teaching. Thus, each teacher has a teaching style that includes, to a greater or lesser degree, a particular level of creativity, so that his or her “style” may be different from that of another teacher, but the results of his or her teaching may or may not be optimal in any case. Increasing their levels of creativity in the classroom is desirable, but not always possible, and we should not lose good teachers because their level of creativity is different from the norm.

Thus, the first conclusion or final reflection is that promoting creativity should not be a barrier to selecting students and teachers. Society cannot afford to do without less creative minds. But it does need to encourage creativity at all levels of education and teaching.

Secondly, despite the above, we must conclude that it is possible to increase students’ creative skills through education, and to train teachers both to be more creative in their classrooms and to teach their students to be creative. One cannot rely only on the intrinsic abilities of the individual, but we must design a curriculum and training for professional development that includes the development of creative skills.

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Chapter 1.4

How can neuroscience inform entrepreneurial behaviour, creativity and education?

Abstract:

This chapter will discuss the potential that neuroscience holds in understanding entrepreneurship and creativity processes. In particular, we analyse how a neuroscience perspective can advance entrepreneurship and creativity concepts, theories and approaches and what does the concept of 'neuroentrepreneurship' mean, along with exploring how such an approach could support a better understanding of the role of experience, intuition and insight in entrepreneurial creativity. So, it could be asked 'What are the neural correlates of entrepreneurial creativity?', and, specifically, 'What is the role of education and learning in changing them?' Neuroscience provides several insights into the different neural structures and processes that might be associated with the creative entrepreneurial process. How can neuroscience inform the recent literature on the realm of the biosocial perspective in entrepreneurship? These questions will structure the discussion of the potential and limitations of the interrelations between neuroscience, entrepreneurship, creativity and educational processes.

Keywords:

Entrepreneurship; Creativity; Neuroscience; Neuroentrepreneurship; Higher Education

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Chapter Structure:

1. Introduction
2. Does neuroentrepreneurship handle significant contributions to understanding?
3. How does the neuroscience perspective can give advance to entrepreneurship and
4. How to better understand the role of experience, intuition and insight in
5. How can neuroscience inform the recent literature on a biosocial perspective in
6. Conclusions, critical appraisal of neurosciences' contribution and educational
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1 Introduction

Over the last 50 years, Academia has sought to understand the several factors that influence entrepreneurial activity as research has highlighted. Factors linked to professional experience (Shane and Khurana, 2003), personality (Leutner *et al*, 2014), socio-cultural factors (Runco and Pagnani, 2011) and biological factors in their interaction with the environment (Shane and Nicolaou, 2015), such as genetic predispositions (e.g., Zhang *et al*, 2009), as well as the role of hormones (Bonte *et al*, 2016; Greene *et al*, 2014; Nicolaou *et al*, 2018; White *et al*, 2006), have been probed concerning the influence of neurodevelopmental conditions (e.g., dyslexia and attention deficit hyperactivity disorder, ADHD) (Logan, 2009; Thurik *et al*, 2016; Wiklund *et al*, 2016, 2017). In the study of biological factors, the neuroscientific approach is the most recent, and has taken some to designate it as neuroentrepreneurship (e.g., Nicolaou *et al*, 2019; Sharma *et al*, 2021), while trying to uncover aspects such as, for instance, how the study of the brain helps us to understand how the entrepreneurial person deals with uncertainty, perceives opportunities, thinks and makes decisions.

This approach, however, is not without controversy, as some researchers recognize its importance, stating that ‘we cannot afford to keep ignoring the foundational micro-antecedent of any human decision and action: our brain⁴ (Martin de Holan 2014, p. 95, as cited by Nicolaou *et al*, 2019, p. 558), while others criticize its reductionist and deterministic focus when trying to understand highly complex cognitive processes and functions (Tracey and Schluppeck, 2014), namely in education where we cannot reduce the realm to brain-based learning, as ‘the language of the brain does not capture the very things that matter educationally’ (e.g., Biesta, 2012, p. 589), not to mention that, in addition, the neuroscience model may contribute to replicate the mind-body dualism. Thus, in discussing the potentiality neuroscience could hold to better understand entrepreneurship and creativity phenomena, it becomes advisable to bear in mind ‘that human brains exist within human bodies which themselves are immersed and responsive to a world of inter-relations’ (Paolantonio, 2019, p. 604).

With these critical voices in mind, we will consider, in this chapter, the potential and limitations that neuroscience may hold to help to understand entrepreneurial and creative processes and learning in an effort to address the following questions: 1) Does neuroentrepreneurship handle significant contributions to understanding entrepreneurship? 2) How does the neuroscience perspective advance entrepreneurship and creativity concepts and theories? 3) How to better understand the role of experience, intuition and insight in entrepreneurship? 4) How can neuroscience inform the recent

4. You may want to watch this video about neurons, briefly discussing all the parts of a neuron: https://www.youtube.com/watch?v=6qS83wD29PY&ab_channel=NeuroscientificallyChallenged

literature on a biosocial perspective in entrepreneurship? 5) What critical appraisal can be made about the contribution of neurosciences and what are the main educational recommendations?

2 Does neuroentrepreneurship handle significant contributions to understanding entrepreneurship?

Neuroentrepreneurship has been considered a prominent subject in recent years due to the significance of brain functioning in entrepreneurial decision-making (de Holan 2014; Korpysa 2020; Krueger and Day 2010; Nicolaou *et al* 2019; Nicolaou and Shane 2014; Tracey and Schluppeck 2014, as cited in Sharma *et al*, 2021). The term was coined mainly to emphasize the neuroscientific perspective in explaining entrepreneurship processes. According to Korpysa (2020), neuroentrepreneurship refers to the study of cause and effect relationships related to the functioning of the entrepreneur's brain, influencing risk-taking capacity, entrepreneurial intentions and competencies to deal with the conditions existing in the environment as well as the processes of pursuing business opportunities. Indeed, researchers are increasingly encouraging the use of neuroscience methods⁵ (e.g., electroencephalogram - EEG, functional magnetic resonance imaging – fMRI, computed tomography – CT, scan and positron emission tomography - PET) for discovering the structure and functions of the nervous system and understanding the brain activity of an entrepreneur.

The brain activity of an entrepreneur is a dynamic process affected by and affecting a complexity of factors (Sharma *et al*, 2021), whose study is placed in the broader domain of entrepreneurship. Entrepreneurship is viewed as a function of human qualities (Bonet *et al*, 2011) that shape entrepreneurial behaviour in the process of making internal changes and external ones relating to the environment in which humans live. Those most frequently mentioned qualities are initiative, leadership skills, ability to devise opportunities, ability to act in conditions of risk and uncertainty, creativity, independence, ability to adapt, internal motivation, extraversionality (being optimistic and establishing contacts easily), meticulousness (observance of existing laws and regulations and willingness to learn from the experience of others regarding problem-solving), and openness to experience (Korpysa, 2020).

Thus, to fully investigate entrepreneurship phenomena, or to capture their complexities,

5. To better understand the neuroscience methods you may want to read the article "A brief history of human brain mapping" from Marcus Raichle (2008) and watch this video about Neuroimaging: https://www.youtube.com/watch?v=N2apCx1rllQ&ab_channel=NeuroscientificallyChallenged; to better understand neuroscience, we recommend Antonio Damasio's book 'Self Comes to Mind: Constructing the Conscious Brain', or you may watch this video: <https://www.youtube.com/watch?v=OvwM6EINGZA>

data from many perspectives should be interlinked since, though neuroscience ‘can provide answers to many unattended questions of the origin and evolution of entrepreneurship’ (Sharma *et al*, 2021, p. 3), it only partially helps to understand entrepreneurship dynamics (Nicolaou *et al*, 2019).

However, as many authors do, we also recognize that neuroscience may add very valuable contributions to the study of entrepreneurship, helping to address questions, for instance as those posed by Sharma *et al* (2021) in their review study: ‘are there different cortical activations in the brain leading to successful entrepreneurial decisions?’; ‘do the brain regions involved in the decision-making process simultaneously process the risk and reward opportunities for entrepreneurial success?’; ‘how does entrepreneurial orientation lead to opportunity recognition, evaluation and exploitation for better decision-making?’, among others (p. 2).

From the point of view of terminological accuracy, it seems to us that there aren’t enough substantive reasons to present neuro-entrepreneurship as a new paradigm of science, as did for instance Korpysa (2020). We question the relevance and conceptual clarity of the term itself. Is there neural entrepreneurship as a substantive and specific domain of study or instead what we have is, simply, the neuroscientific perspective of entrepreneurship phenomena? Analogically, does it make sense to call/designate the studies of creativity approached by neuroscience as ‘neurocreativity’ or the studies of mindfulness/meditation as ‘neuromindfulness/neuromeditation’? It seems not! The emphasis must be placed on different perspectives from which a phenomenon is considered and its inter-relations, including neuroscience branches (molecular neuroscience, systems neuroscience, behavioural neuroscience, cognitive neuroscience, social neuroscience, and computational neuroscience) as proposed by Sharma *et al* (2021), which undoubtedly enrich our understanding of entrepreneurship and, as such, can be seen as complementary, giving access to specific contours and relations of the many components or processes of the phenomenon that neuroscience is able to capture.

That said, and not overestimating but also not underestimating it, let’s consider how the conceptualizations about entrepreneurship and creativity may benefit through a neuroscientific perspective.

3 How does the neuroscience perspective can give advance to entrepreneurship and creativity concepts and theories?

Nicolaou *et al* (2019) have proposed a framework for precisely organizing research in order to get advances on entrepreneurship concepts and theory. Leaving aside the dichotomizing idea of entrepreneurs versus non-entrepreneurs and seeing entrepreneur-

ship as 'a collection of activities including the identification, evaluation and exploitation of opportunities, typically under conditions of uncertainty' (p. 559) these authors consider that neurosciences can play an important role in understanding the antecedents of entrepreneurial activities and their very nature. The authors distinguish four ways in which neurosciences can be relevant to the field of entrepreneurship: 1) by capturing mental processes that cannot be investigated by other techniques; 2) by informing the construct validity (convergent and discriminant) of entrepreneurship; 3) by examining antecedents and temporal order of entrepreneurship variables; and 4) by refining different theoretical perspectives beyond what behavioural and self-response data allow. Under this spectrum of approaches, we can exemplify with the investigation of the important relationship between intuition and entrepreneurship (e.g., the gut feelings of investors). Related to the refinement of theoretical concepts and constructs, let us first consider the second and fourth ways.

At the conceptual level, researchers are interested in refining latent constructs, defined as something that exists theoretically but that is not directly observable, and in obtaining validity indicators, whether discriminant validity (when the construct fails to correlate with other, theoretically distinct, construct) or convergent validity (the overlap of observations when presumably the same construct is under investigation) (Vogt, 1993). Neurosciences can play an important role in this regard. Relating latent constructs to neural activity, investigation based on brain imaging techniques will help to understand, for example, whether similar or distinct constructs have the same or different neural substrates, allowing for more precision defining the boundaries of key constructs.

As an illustration, Nicolaou *et al* (2019) invoking the work of Amodio and Devine (2006) have found that constructs supposedly referring to identical behavioural processes, namely, implicit race bias, stereotyping and prejudice, have distinct neural substrates, which point to different phenomena. And the same was evidenced by Singer and Klimecki (2014) for the constructs of empathy and compassion that relate to different networks in the brain.

This shows that neuroscience has an important role concerning claims about construct validity regarding several constructs involved in entrepreneurship itself. For instance, the cognitive styles involved in entrepreneurship have been the subject of discussion, with some who recognize a more analytical or more intuitive dimension, pointing to a more one-dimensional or two-dimensional construct. The neuroscientific approach can help clarify these possibilities.

Academics also do not generally distinguish the attitudes of overconfidence and over-optimism in entrepreneurship (Herz *et al*, 2013; Ilieva *et al*, 2018), but the relationship can be better understood by investigating its neural substrates. If the brain activity,

linked to these two constructs, is located in different regions, this will support the discriminant validity measures.

A large part of investigations in the social and human sciences tend to use subjective measures derived from self-responses (e.g., scales), and it is very important to complement data with more objective and direct observation measures for greater theoretical accuracy. This was effectively evidenced by Baldacchino *et al* (2015) in a systematic review study on intuition and entrepreneurship, finding that research data were mostly obtained through self-response measures.

The contribution of neurosciences at the level of theoretical refinements may also be important to clarify any differences between entrepreneurial intuition and general intuition (Nicolaou *et al*, 2019). If we consider the close relationship between intuition and the affective dimension (Dane and Pratt, 2007), neuroscientific studies can shed light on the brain regions activated in these processes and identify, for example, if the limbic regions are effectively associated, allowing to improve the theory about the nature of intuition. Are the two modes of processing information (intuitive/implicit vs analytical/explicit) two separate constructs altogether that operate independently, as argued by proponents of dual-process theory (Hodgkinson and Sadler-Smith, 2003a, 2003b) or do these two modes of processing constitute two opposite ends of the same bipolar construct? Neuroscience holds the potential to address this debate.

Some authors consider that cognition and emotion are closely linked systems (e.g., Hayton and Cholakova, 2012). Hence, methods are being developed to better distinguish the brain activity evoked by different cognitions and emotions (Kassam *et al*, 2013) that may help to further clarify to what extent decisions are more rational and/or linked to areas of emotional processing. For instance, what areas of the brain are associated with different emotions and motivations? Investment motivations more prosocial in nature (altruistic, willingness to help others) or motivations more related to financial compensation and low risk, associated with the investment opportunity, do activate different brain regions? According to Rilling and Sanfey (2011), research showed that altruistic and emotional rewards involve the ventromedial prefrontal cortex (PFC), while the anticipation of financial rewards elicits the nucleus accumbens (Knutson *et al*, 2001). Although it is cautious not to try to fall into ‘traps’ of the type of reverse inferences⁶, neuroscience research shows brain activity that the person is not aware of (Haynes and Rees, 2006; Nicolaou *et al*, 2019) and can be a predictor of entrepreneurial responses, even without the person knowing it or before the person begins to assess conscious stimuli.

Concerning the role of feelings and emotions, the study of ‘entrepreneurial emotions’ is

6. To infer emotions or cognitive functions from activation of brain regions rather than the opposite.

also gaining importance through the link between various emotions and the steps of the entrepreneurial process (Cardon *et al*, 2012). Meta-analysis studies (Vytal and Hamann, 2010) show that different emotions are associated with activity in different brain areas (e.g., fear activates the amygdala, happiness activates the basal ganglia). Emotion induction through imagery activates the occipital cortex and the amygdala, while sadness mobilizes the subcallosal cingulate (Phan *et al*, 2002).

Research with fMRI shows that entrepreneur's passion is highly associated with capacity to take risks and seize business opportunities (Shane *et al*, 2019) and that 'entrepreneurs feel similar emotions to parents caring for their children, i.e. a sense of belonging, agency and security' (Lahti, 2019, as cited by Korpysa, 2020, p. 2611). It is the neurotransmitters that flow from emotions that stimulate decisions and actions taken by entrepreneurs.

On the other hand, it can also help to refine entrepreneurial theories about creativity. According to Weinberger *et al* (2018), after the seminal work of Schumpeter (1934), several studies have investigated the relationship between entrepreneurship and creativity, proposing that entrepreneurs are more creative than other people. This could be inferred from the found positive correlation between white matter tracts in the 'corpus callosum' and the frontal lobe (Takeuchi *et al*, 2010); or on the basis of the registered higher intra- and inter-hemispheric coherence (Jausovec, 2000). Indeed, creativity seems to be supported by diverse high-level cognitive functions (Folley and Park, 2005), as some people may perceive entrepreneurial realities differently than others due to differences in functional connectivity within certain networks of their brain. According to Beaty *et al* (2018) 'creativity was associated with a pattern of functional brain connectivity consisting of frontal and parietal regions within default, salience and executive brain systems' (as cited by Nicolaou *et al*, 2019, p. 569). These investigations point to the need to better understand how the cognitive and emotional dimensions are involved. For example, how are the processes of entrepreneurial creativity associated with cognitive and emotional functions? Do some prevail more than others, or are they deeply interconnected? Finding answers through the lens of neuroscience is crucial for such refinements (LeDoux, 2000).

Indeed, according to Nicolaou *et al* (2019), 'many topics of interest to entrepreneurship scholars in the areas of cognition, affect and decision making have already been studied by neuroscientists' (p. 570), showing that a link between the two disciplines appears to hold promise. This link seems to be particularly relevant and can be mutually enriched, with regard to studies focusing on uncertainty, novelty, time pressure and heightened emotions.

Entrepreneurial intention is being studied in the context of molecular neuroscience help-

ing to better understand entrepreneurial decision-making. Scientists found it correlated with genetic variation. Since serotonin and dopamine polymorphism genes were found to be associated with risk-taking activities (Kuhnen *et al*, 2009), on their part, Sharma *et al* (2021) believe the study of biomarkers in genetic variation may contribute to understanding specific behavioural characteristics in entrepreneurial decision-making. From the point of view of behavioural neuroscience⁷, Attention-Deficit Hyperactive Disorder (ADHD) may also be involved in understanding entrepreneurial intention. Higher levels of ADHD behaviour are positively associated with entrepreneurial intentions and also with self-employment (Verheul *et al*, 2015, 2016).

4 How to better understand the role of experience, intuition and insight in entrepreneurship?

The entrepreneurship literature suggests that entrepreneurial experience is beneficial to entrepreneurs and it is closely linked to neuroplasticity. As Korpysa (2020) states, 'although the knowledge about the human brain functioning is still fragmentary and multithreaded [...] cognitive neuroscience confirms that entrepreneurship is the result of a dynamic feedback between neuroplasticity and the stimuli that affect it' (p. 2611). Neuroplasticity is simply defined as the capacity of the nervous system to modify its organization involving 'a complex, multistep process that includes numerous time-dependent events occurring at the molecular, synaptic, electrophysiological, and structural organization levels' (Sagi *et al*, 2012, p. 2611). In parallel, it must be noticed that the referred capacity appears as related to the occurrence of multiple processes such as short-term strengthening and weakening of synapses, long-term potentiation, and the formation of long-lasting neuronal connections (Sagi *et al*, 2012). These processes are shaped by experiences (the many interactions between the person and the environment) and may result in learning, unlearning and relearning. Therefore, it should be stressed that an 'entrepreneur's brain' can and should be trained like muscles.

According to the research findings, a given person's entrepreneurial traits and behaviour can be developed due to the multiple repetitions of behaviours and thoughts (Korpysa, 2020). For instance, based on the EEG-based neurofeedback training system to improve the innovation behaviour of entrepreneurs, Zheng (2018) found it to be positively associated with personality characteristics such as extraversion, openness to experience, agreeableness and conscientiousness and negatively associated with neuroticism. On the other hand, research with EEG shows that neuroplasticity helps shape sense of

7. The behavioural neuroscience studies biological behaviour and neural networks of integrated behaviours.

control, entrepreneurial attitudes, intentions and norms as well as the entrepreneurial orientation of an individual (Bernoster 2018).

In the entrepreneurial orientation of a person, recognising entrepreneurial opportunities is a major part of the journey (Shane and Venkataraman, 2000, as cited by Nicolaou *et al*, 2019). Although it involves rational and conscious processes, explained for instance by the theory of planned behaviour, 'humans process information in two distinct modes or at two different levels' (Dane and Pratt, 2007; Hodgkinson and Sadler-Smith, 2018, as cited by Nicolaou *et al*, 2019, p. 560-561). The first mode is characterised by non-conscious, automatic, inductive, holistic thought and also 'associative, fast and contextually dependent' mental processes (Baldacchino *et al*, 2015, p. 212), which gives rise to intuitive processing. The second mode 'is characterised by conscious, rational, logical, sequential, deductive and detailed reasoning, which results in analytical processing' (Allinson *et al*, 2000; Dutta and Thornhill, 2008, as cited by Nicolaou *et al*, 2019, p. 561). The first mode seems to be used a lot by entrepreneurs to help them make key decisions, thus intuition is considered a field where neuroscience can bring advances in research on entrepreneurship, namely on these hidden mental processes (Baldacchino *et al*, 2015). Indeed, during the investment decision-making process, researchers can understand, through neuroimaging, how intuition influences investment choices. In neuroscientific terms, we begin to understand which brain structures are involved in these processes that are outside the conscious, volitional and intentional sphere. Lieberman (2000) identified as an important support for intuitive processes the basal ganglia with its caudate and putamen components, as well as the implicit learning processes as a cognitive substrate of intuition.

The study of implicit attitudes affecting behaviour without the person being aware of it has been identified as involving several brain regions, such as the amygdala, dorso-lateral PFC and anterior cingulate cortex (ACC), whose activity reflects its automatic regulation (Stanley *et al*, 2008).

Diverging implicit and explicit attitudes towards situations and outcomes, they are important factors to be considered when we want to understand entrepreneurial decisions (Phelps *et al*, 2000). Unconscious beliefs and behaviours can be so important as explicit attitudes explaining assessments, behaviours and results, which takes to recognise, once more, the importance of neuroscience approaches.

Le Pertel *et al* (2020) situate these processes in subjective modes of knowledge based on intuition, feelings, heart, gut, inner voices, i.e., the knowledge that comes from getting in touch with a person's inner wisdom (as in traditionally cultivated contemplative practice). This inner wisdom may be stimulated through diverse practices. For instance, the practise of controlled breathing (slow, deep, diaphragmatic, and exhalation-predomi-

nant) that activates vagal control, 'priming the nervous system for new ways of thinking' (Le Pertel, 2020, p. 815) or mental activities only, which require meditation to outburst. As Korpysa (2020) states, 'it has been proven that the brain of an entrepreneur can also change under the influence of purely mental activities, e.g. meditation or cognitive-behavioural therapy' (p. 2611). Nevertheless, there is still a great deal to be learned about intuition, which is made difficult due to the non-conscious and affectively charged nature of intuitive processing as compared to analytical processing (Allinson *et al*, 2000; Dutta and Thornhill, 2008; as cited by Korpysa, 2020).

From a neuroscience point of view, it is the right brain hemisphere that is responsible for thinking processes that are not consciously controlled, as intuition and associative memory (Korpysa, 2020). Studying the decision-making behaviour in employees' innovation, Zhong (2018) found a greater thickness of cortex and grey matter of the right hemisphere pointing to the importance of structural connectivity in decision-making. The left hemisphere, on the other hand, is where thinking is focused and conscious. But it is thanks to the synergy of processes in both hemispheres, that the entrepreneur gains the exploratory and creative abilities (Krueger and Day, 2010).

Closely related to intuition is insight. The perception of entrepreneurial opportunities can come from a 'flash of genius' (Drucker, 2002). Neuroscientists are investigating the neural correlates of insight – the 'aha moments' – defined as 'any sudden comprehension, realization, or problem solution that involves a reorganization of the elements of a person's mental representation of a stimulus, situation, or event to yield a nonobvious or nondominant interpretation' (Kounios and Beeman, 2014, p. 74). Research using both EEG and fMRI, in separate experiments, found that the moment of insight was associated with increased activity in the right hemisphere anterior superior temporal gyrus and a burst of high frequency (gamma-band)⁸ activity in the same area (EEG study) (Jung-Beeman *et al*, 2004), an area associated with distant information connections linked to understanding. The use of transcranial direct current stimulation (tDCS) techniques is another method that is being used to enhance insight with interesting results (Chi and Snyder, 2011, 2012). The advent of these techniques allows treating brain activity as an independent rather than a dependent variable, helping to reveal hidden processes (Kounios and Beeman, 2014; Nicoulaou *et al*, 2019).

Entrepreneurs have a 'creative capacity to recognise gaps and to identify possibilities' (Crossan *et al*, 1999, as cited in Nicolaou *et al*, 2019, p. 566). Using creativity tools in education 'are assumed to induce creative thinking, facilitating the development of new solutions, and creative problem-solving in team-based entrepreneurial projects' (Mc-

8. Brain wave frequency ranging between 25-100 hz. Although its role is still under great debate, it is associated with diverse cognitive functioning including direction of consciousness, mindfulness meditation and high levels of synchrony in long-term meditators (Schaefer, 2018).

Fadzean, 1998, as cited in Pettersen *et al*, 2019, p. 1139). Developing creativity in entrepreneurship education, 'implies a focus on behavioural elements such as ingenuity and problem-solving skills' (Colette *et al*, 2005, as cited in Pettersen *et al*, 2019, p. 1139).

Gardner (1999, as cited in Ferreira and Carvalho, 2017) states that all creative work has rules and cognitive science seeks to understand how reasoning and the elaboration of ideas work in the creative process, as well as memory, the evolution of ideas, creativity and experience. In cognitive neuroscience there is a close relationship between problem-solving and creativity development.

Social entrepreneurship (SE) is a growing movement whose purpose is connecting social mission and entrepreneurial action. Therefore, social entrepreneurs could be thought of as experts building 'collaborative relationships with diverse stakeholders for achieving social innovation' (Ip *et al*, 2018, p. 133). As shown by Smith *et al* (2014), they exhibit statistically higher levels of creativity and risk-taking compared to other kinds of entrepreneurs. A possible explanation is that social entrepreneurs strive to develop creative mechanisms for circumventing environmental barriers.

According to Ip *et al* (2018), the three factors most affecting the social entrepreneurial intentions of university students are prior experience with social problems, perceived social support, and originality. Prior experience with social problems affects all the mediators of entrepreneurial creativity, which can be assessed on two dimensions, namely originality and usefulness, and 'has been found to have a profound impact on social entrepreneurial intentions, particularly in terms of entrepreneurial originality' (Ip *et al*, 2018, p. 133).

Thus, the research results previously considered underline that better understanding the mental processes hidden in entrepreneurial and creative processes, through neurosciences such as intuition, emotions, insights, implicit attitudes and subjective knowledge is important, and there is still very little research on the relationship between them.

5 How can neuroscience inform the recent literature on a biosocial perspective in entrepreneurship?

As Thomas Csordas argues, 'the body cannot be separated from the social. For instance, cultural neuroscience combines brain imaging with cultural psychology to analyze the "mutual constitution of culture and mind"' (Zhou and Cacioppo, 2010, as cited in Schaefer, 2018, p. 87).

The socialization experiences of childhood and adolescence, including school education, family and role models, seem to be important for the development of creative

potential and activity involvement. For instance, since we internalize values and beliefs expressed by important people in our lives, when they reject, ignore, humiliate or devalue our behaviours and/or ideas, it will have a negative impact, resulting very often in low self-esteem (Gazzaniga and Heatherton, 2007, as cited in Ferreira and Carvalho, 2017). Based on Bandura's theory, Feist *et al* (2015, as cited in Ferreira and Carvalho, 2017) assert that social persuasion can encourage or reduce self-efficacy and depending on the status and authority of the persuader, exhortations or criticisms can convince the individual to develop an activity, or not.

Gerrig and Zimbardo (2005, as cited in Ferreira and Carvalho, 2017) state that cognitive development is not enough, that is, the development of cognition processes (imagining, perceiving, reasoning and solving problems) to ensure the promotion of creativity, as socialization processes generate beliefs and ideas that impact, act and direct individual beliefs and behaviours. In line with what we said earlier, Gerrig and Zimbardo (2005, as cited in Ferreira and Carvalho, 2017) concur that cognitive development could be a necessary but not sufficient condition for igniting creative and entrepreneurial processes.

Also emphasising the importance of the sociocultural dimension, Runco and Pagnani (2011) point out that family, school, work environment, sociocultural context and health influence the development or inhibition of creative potential and, thus, the formation of a creative personal identity.

Koestler (1964, as cited in Pettersen *et al*, 2019) created a model of creative thinking named bisociation, which has been applied in research on creativity and entrepreneurship (Bulut *et al*, 2013; Ireland *et al*, 2003; Scott and Bruce, 1994; Smith and Di Gregorio, 2002; Sung and Choi, 2012, as cited in Pettersen *et al*, 2019).

Bisociation allows mixing concepts from two contexts or categories of objects that are not connected by normal thought processes. Bisociation distinguishes metaphorical thinking, which leads to creative actions (combination of elements from a 'matrix' of different thoughts), from associative thinking (combination of elements from the same 'matrix' of thought). According to Dubitzky *et al* (2012, as cited in Pettersen *et al*, 2019), 'when individuals combine previously unconnected matrices of thought, they experience the creative act of bisociation' (p. 1140).

The Bisociative Scale embodies the basic notion of bisociation, focusing on individuals' intrinsic enjoyment of being in a state of creative workflow. Thus, the Bisociative Thinking Mode developed by Ko and Butler (2006, as cited in Pettersen *et al*, 2019) 'incorporates the idea of bisociation as it centres on the ability to link unrelated ideas' (p. 1143).

Research from a biosocial perspective is important to understand the mentioned processes. For example, how do mental processes mediate the relationship between ge-

netic predispositions and entrepreneurship? Utilising a traditional twin methodology with samples of identical (monozygotic) and non-identical (dizygotic) twins, scholars have attempted to disentangle genetic from environmental influences in entrepreneurship (Nicolaou *et al*, 2008a; Shane *et al*, 2010, as cited in Nicolaou *et al*, 2019; Zhang *et al*, 2009). These twin studies revealed heritability estimates around 40%, both in the predisposition to be an entrepreneur and in recognizing opportunities.

Another strand of the biological perspective on entrepreneurship has looked to hormones. White, Thornhill and Hampson (2006, as cited in Nicolaou and Shane, 2014) found that individual differences in testosterone levels were associated with entrepreneurial activity. They verified a genetic influence of higher testosterone in people with experience in start-ups. The relationship of prenatal testosterone with entrepreneurial intention was also investigated and Bonte *et al* (2016) have effectively verified this link.

Some studies also point to the role of neurotransmitters in the human brain in the relationship with entrepreneurship such as dopamine and serotonin. For example, research has suggested that a particular variant of the dopamine receptor (DRD3) gene may be associated with entrepreneurship (Nicolaou *et al*, 2011), along with sensation seeking (Nicolaou *et al*, 2008b, as cited in Nicolaou *et al*, 2019).

6 Conclusions, critical appraisal of neurosciences' contribution and educational recommendations

Neurosciences research has been achieving great visibility and importance in the scientific community and society, at large, due to the many new findings related to brain phenomena and functions. Simply, we can say that it relies upon the study of the nervous system in our bodies, which is responsible for performing many essential functions for our lives. Some of them are essential for surviving and not controlled by the person, others are very complex and intimately related to our thoughts, feelings, emotions and other complex processes. If the brain is the main organ of the mind, as many people believe, is still controversial. Our knowledge about it is still flimsy. Nevertheless, we may assume that it constitutes a different perspective for understanding human ventures.

The data coming from neurosciences studies need to be contextualized, interpreted, put in the broader context of relations with other scientific fields and knowledge and, as all scientific knowledge, submitted to critical analysis. However, although neuroscience is a recent domain of research, we should not consider its data to be simplistic. As Hasenkamp and Namgyal (2017) argue, 'neuroscience is highly interdisciplinary and can be studied at multiple levels of investigation, each with their own methodological techniques and scope of inquiry' (p. 203): molecular level, cellular level, networks level

(such as perceptual or affective systems, using electrical or magnetic imaging methods). Neuroscientists themselves are challenged to integrate these several levels of investigation. Whatever the case, a reflective stance should inform the way we read and give meaning to the data emerging from neurosciences. That's why it is important to take into consideration the arguments of the critical voices.

In this context, it is important to remember that the brain is only a part of the equation in understanding human behaviour since behaviour is contingent on other physical systems of the body as a whole, other people and the environment.

Neuroscience methods have produced astonishing results, even though their accuracy also has limitations. Its validity has been criticized: overestimation of effect size; issues of reverse inference; problems of ecological validity; high costs and requiring long specialized training (Nicolaou *et al*, 2019).

Some researchers share the view that the use of cognitive neuroscience methods and techniques in explaining entrepreneurial processes is groundless, mainly because neuroscience is unable to understand processes related to the essence of entrepreneurship, based on quite considerable uncertainty and complexity. According to Tracey and Phillips (2011) results of neuroscience experiments can significantly distort the substance of the entrepreneurial process.

There is also a debate related to 'what scientific progress in neuroscience could mean for humanity and the associated *ethical* issues it raises' (Nicolaou *et al*, 2019, p. 571). Ethical issues, or neuroethics, a term coined by William Safire in 2001, should be highly considered in neuroscience research (Farah, 2012).

Aware of the great picture composed by these important inter-relations, as educators we might ask how we should consider the topic of entrepreneurship and creativity informed by the neuroscience perspective? How should we face the importance of entrepreneurship and creativity in the context of the demands of higher education in contemporary societies? We believe that the many challenges that we face nowadays as individuals and communities, the challenges of living better our individual and collective lives need to be *a priori* considered. And this could be related to another question: in what manners shall we appropriate the many findings coming from research in the domains of entrepreneurship and creativity under different perspectives, including neuroscience?

Independently of the several ways it could be done, we believe it is not expedient to always adopt a critical stance in analysing the discourse of the many benefits they have for persons and societies and learning to discriminate the many forms in which it could, for instance, in the name of buzzwords –as 'be creative' – become seductively and subtly reinforcing conditions of human imprisonments. This can be better understood if we

learn to give importance to stop, pause and reflect about the society in which we want to live in and how we could participate in building/shaping it, channelling our efforts and capacities in that direction. In this scope, we consider it very important to learn to be aware and to tune in with the many critical voices (e.g., Berardi, 2009; Biesta, 2012; Oliveira, 2021; Reis and Formosinho, 2020). Such an attitude resonates in us the need to change the paths we have taken and to choose others that are more just, sustainable and joyful for all.

As the quoted authors underline, we have gone through the shift from industrial capitalism's exploitation (Fordist models reducing worker's bodies to tools) to a more contemporary subtle form of capitalism's exploitation and alienation, one that tends to undermine our identities as human beings in the sense that workers are thought to intimately identify themselves with their jobs. And, as Paolontino (2019) put it based on Berardi work, 'the pleasure of freely spending time with and giving time to others –that would nourish and animate us towards the collective dimension of our existence–, now seem trivial, perhaps even embarrassing, when undertaken for their own sake outside of the compulsion to "network"' (p. 609).

This kind of argumentation helps us to see with divergent eyes that the economic prosperity in the post-industrial societies, where entrepreneurs and creative professionals are so encouraged, those 'who follow their curiosity, who are constantly learning, who are innovators, problem solvers and critical thinkers in the digital era' (p. 606), may indeed be leading to what Berardi (as cited in Paolontino, 2019) calls 'diseases of the soul' related to the raising of psychological disorders such as panic, stress and depression in our contemporary societies, along with megalomania, rampant individualism and atavist egocentrism.

Bearing in mind that an important role of universities is to educate to resist any form of enslavement, we shouldn't however neglect that the research reviewed in this chapter points to multiple benefits of promoting entrepreneurship and creativity – abilities that can be developed in every student and implemented by means of education (Ferrante *et al*, 2019).

From the perspective of pedagogy and neuroscience, it is important for students to be considered the protagonists in learning (Pettersen *et al*, 2019). Students learn in many different ways (reflecting, acting, reasoning logically as well as intuitively, memorizing, visualizing, drawing analogies, building models) (Fayolle *et al*, 2020) and experiential and practice-based learning are of utmost relevance. The literature emphasizes the importance of teamwork, interdisciplinarity, involvement in projects (Ip *et al*, 2018; Pettersen *et al*, 2019; Ferrante *et al*, 2019), mind maps (Peña *et al*, 2011, as cited in Ferreira and Carvalho, 2017), wishful thinking (McFadzean, 1998, as cited in Pettersen *et al*,

2019), journaling, meditation/yoga, breathing exercises, the use of storytelling, imagery and symbolism (Le Pertel *et al*, 2020; Pettersen *et al*, 2019), mindwave and the mindflex (Ritter *et al*, 2020).

Thus, educators should carefully design coursework, class activities and projects to address motivational, cognitive, affective and intuitive/insight dimensions of learning in a balanced way. Based on all learning methods, we recommend the following pedagogical aspects systematized by Felder *et al* (2000, as cited in Fayolle *et al*, 2020), as a learning-action activity: a) prepare clear instructional objectives; b) consider relevance of course material and bottom-up methodologies; c) balance conceptual and pragmatic learning; d) promote active learning in the classroom; e) use team-work learning; f) use challenging but fair evaluations; g) convey a sense of concern and empathy about students' learning. And as another step into action concerning creativity and entrepreneurship training and pedagogies, we invite readers to take a look on the resourceful literature cited in the previous paragraph.

Entrepreneurship education has an important role not only in promoting entrepreneurial awareness and entrepreneurial behaviour, but also in training entrepreneurial intentions, increasing the potential of student's involvement in entrepreneurial actions and star-ups (Ferrante *et al*, 2019), especially if they improve social welfare (Fayolle *et al*, 2021; Ip *et al*, 2018). At the same time, given the interconnection between entrepreneurship and creativity, higher education should stimulate both, in other words, fostering entrepreneurial creativity.

7 References

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Chapter 1.5

Early influences on entrepreneurship career path development

Abstract:

This chapter will address the issues of career nature, employability, and career development of children and young people in the context of lifelong learning. As this article is elaborated within the project “Beyond the Limits: Developing Entrepreneurship via Creativity in Schools” (2020-1-TR01-KA203-093989), which targets young people (pupils and students), it will not specifically address the later stages of a person’s life cycle – the career development of adults and elderly people.

The aim of the chapter is to understand the importance of early career influences on professional growth of the individual. The content of the chapter is relevant to teachers, students, students’ parents, and others interested in career development, for example, entrepreneurs who implement shadowing activities for students.

The learning outcomes to be achieved after studying this chapter are, for young learners and/or the educators:

- understand the nature and importance of career development;
- know career-building areas of activity;
- understand career development tasks in different life cycles;
- understand the impact of labour market changes on career development.

There are questions for reflection and discussions at the end of the chapter to relate the concepts and content to better understand the presented material.

Keywords:

employability; career development; children and young people; lifelong learning

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Chapter Structure:

1. Introduction
2. Career, Explanation of its Essence
3. Changes in the Labour Market
4. Employability skills

5. Process of Career Formation and Development in Childhood and Youth
6. Career Development in Childhood (up to 12/13 years)
7. Career Development in Adolescence and Youth
8. References

1 Introduction

We live in a special time, and it could be argued that the old dream of modern civilization thinkers – the opportunity to become a world level player from a very small company in any field of economics – has come true (Pīlēns, 2018). There is an opportunity to develop economic cooperation without borders, to implement the increasingly free movement of people in time and space, which has been significantly affected by the COVID-19 pandemic and the restrictions it has brought over the two years of the COVID pandemic. However, when living in an increasingly uncertain world, people need to become more creative in order to meet the challenges of the complex world (Robinson, 2013). Success in entrepreneurial careers including entrepreneurial development in social, community, politics, and other areas, also depends on finding the right employees who can work fast, in line with the rapid pace of global development, and who are competitive, successful and creative when meeting the deadlines. In addition, it is important, whether the person has chosen a career according to one's abilities and interests and has acquired career management and employability skills.

Today, no one is surprised that our lives are constantly changing. The cause of concern is the pace of change, as a large part of society cannot keep up with it. The changes associated with globalization are not only positive, because all the changes involve people, and everyone is so different both in terms of opportunities and adaptation abilities. While the overall benefit of the process of change is generally positive, not all people benefit from it. In order to remain in the labour market, an individual must become a manager of one's own career resources and work environment processes, and a person must be able to take responsibility for his or her own career decisions. These are skills that a person begins to acquire in preschool and continues in school and throughout the future life.

2 Career, Explanation of its Essence

Nowadays, the meaning of the concept of career has expanded considerably. If initially the concept "career" was explained and associated with a successful activity in some professional field (Byrne and Beavers, 1993; Holland, 1997; Patton and McMahon, 2006), in which there is a possibility to gain prominence, fame and popularity, then at present, the career is interpreted not only as a professional development, but also as a general growth of the personality and a successive change of occupations throughout life (Freeman, 1993; Collin and Watts, 1996; Riemere, 2013; Lāce, 2014). In a broader perspective, a career is defined as a purposeful, meaningful course of a person's life, which sums up

all the roles of an individual's life, leisure activities, studies and work (Lent and Brown, 1996; Lent, Brown, and Hackett, 1994, 2002; Lāce 2014).

Career is related to a person's development in the main life activities (work, family, recreation), a person's social activity, which includes "a person's efforts to reach a state in which the personal needs are satisfied" (Lāce 2011, 139). It is suggested that while developing a career, an individual perfects his/her professional self-concept, which includes searching for answers to the questions about personal talents, skills, competence, main life motives, needs, goals, willpower problems, personal values, according to which people evaluate how well they feel about what they are doing (Lāce 2011). Human motives, values and talents gradually merge into the *career's Self-concept* and give the individual a sense of who I am, who I am not and who I want to be (Lāce 2011). In today's world, the key to a successful career management is a clear development of identity, followed by setting the career goals and, finally, a choice of career strategy that is consistent with this identity, meaning that it is a conscious activity and a motivated choice (Callanan, 2003).

Career is usually associated with an upward development with continuous progress, but it also does not preclude declining professional and social development. Traditionally, a professional career is viewed as studying, starting a job, professional development, development of individual skills and abilities, retirement, which takes place within one profession or group of professions (Walsh and Savickas, 2005; Van Esbroeck and Athanasou, 2008). However, today a career can be pursued within one or several different organizations – vertically, horizontally or in a circular way (Lāce, 2014).

Nowadays, the concept "career" is increasingly used not only from a narrowly professional point of view, but also when thinking about the choice and planning of one's life path in general (Ertelts and Šulcs, 2008). The concept "career" means growth not only in the professional sphere, but also in five areas of life activity: 1) family, 2) work, 3) spirituality, 4) citizenship, 5) leisure.

Family is one of the most important areas of a person's life; therefore, it is important that the career is arranged according to a person's wishes and needs. In the course of life, a person makes many different choices that are applicable to family and personal life within it.

Work. It is important for a person to do work that gives both moral satisfaction and sufficient financial security. A person can get a feeling of satisfaction from work, but also from studies, which the person finds interesting and exciting and in which one sees the opportunity to realize his/her abilities and potential. Nowadays, in order to keep up with the ever-changing world of work and remain competitive in the labour market, each of us needs to learn continuously, throughout our lives.

Spirituality is an area that provides an opportunity to perfect your own spiritual world and the world around us. The routes can be different for everyone. Besides work and family, everyone needs time for enriching themselves, for perfection and development. It is time and activities that we dedicate to our emotional and spiritual growth.

Citizenship is the time and energy that we devote to society and good deeds. This need – to feel part of the society differs for everyone, but it is part of every person's life.

Leisure time is a moment that a person sets aside for his/her relaxation in order to feel good, relaxed and then to be able to work with enthusiasm and full return. Therefore, it is important that a person has this free time and is able to spend it according to one's wishes and needs. It is important to keep in mind that free time and various hobbies give people opportunity to realize their interests that they cannot implement at work (Jaunzeme, 2013).

Thus, it can be concluded, that career is self-affirmation, person's activity towards achievement of one's goals, a proof of one's talents and abilities. It is also an activity in personal life, acknowledgement of one's *Self* as personality, improvement of one's material condition, 'climbing the career ladder'. A successful career means balance in life, work and family that meets the spiritual and aesthetic values of each person, as well as includes sense of citizenship and qualitatively spent leisure time.

3 Changes in the Labour Market

The labour market has undergone significant changes that are forcing people to reassess and adjust their careers.

These changes are related to:

1. **change of the locus of responsibility:** responsibility for career development is transferred from employer to employee (Janasz and Forret, 2008);
2. **lower security about job availability,** meaning that the job may not be long-lasting (Kuijpers, Schyns and Scheerens, 2006);
3. **career without borders** (boundaryless career), characterised by moving from one employer to another, offering oneself to the labour market (McDonald and Hite, 2008);
4. **job satisfaction** (Heslin, 2003);
5. **subjective and objective career** (Judge et al., 1994).

The transfer of the locus of responsibility for career development from employer to employee (Janasz and Forret, 2008) means that the employees increasingly have to

take responsibility for their own career development and develop ability to adapt to the changing demands of the work environment. The fact that the current job might not be long lasting requires continuing learning and becoming competitive. The possibility of losing one's job can create a feeling of helplessness, which employees can avoid by improving their skills (Kuijpers, Schyns and Scheerens, 2006). People are not protected from losing their jobs, and no profession is "forever" anymore. This creates a new aspect of career development – boundaryless careers, which means a simple transition from one employer to another (McDonald and Hite, 2008), from one field of activity to another. Changes in the society and in the labour market mark the decline of many professions and the emergence of new professions, changes in the education system and its content, drastic changes in the labour market, the introduction of outsourcing, and atypical business cycles create new demands on the employee, including the need for employability skills.

4 Employability skills

One of basic concepts when speaking about the labour market is employability – the ability of an individual to get or keep a job, the ability to realize one's potential in the labour market and increase competitiveness (Gvozda, 2015). The concept of employability marks the set of basic skills needed for an individual for entering the labour market in the 21st century. However, it is important to distinguish or not confuse these two concepts: *employment* and *employability*, where employment is understood as an engagement in work relations, but employability – as an individual's will and ability not only to obtain, perform and retain the job, but also, if necessary, to change occupation, expand career boundaries, acquire or improve competencies, upgrade or acquire new qualifications, proactively adapt, train one's flexibility, operate in a rapidly changing labour market situation, make purposeful investments in one's development and be employed during the whole life (Gvozda, 2015).

Together with employability, it is also important to look at the concept of career management skills. According to the explanation given by the European Lifelong Guidance Policy Network (ELGPN), career management skills are a set of competences (knowledge, skills, attitudes) that enable people to shape their study and working lives at any stage of their lives. Knowledge, skills and attitudes are related to self-organization, learning and career management (ELGNP, 2010; ELGDP, 2015; Chen, 2015).

Career management skills can be explained as competencies (knowledge, skills, attitudes) that are needed to plan and manage one's own career while maintaining self-motivation, and to progress successfully in one's career (or in interconnected

areas of life such as education, work, professional activity, family, leisure time and citizenship, fulfilling roles relevant to each sphere of life and based on each person's personal understanding of a successful career, success, growth and personal freedom), including:

1. to develop, implement and control one's own career goals, strategies and progress at each career level, to make career-related decisions,
2. to plan, organize, self-manage and control the effective use of internal and external resources to achieve life and career goals throughout the life, to engage in lifelong learning,
3. to cultivate one's individual value system and character traits,
4. to implement interests and improve talents and skills,
5. to successfully change a career according to new career models,
6. to deal with uncertainty by creatively thinking about the current problems,
7. to find and maintain a balance between professional activity and personal life (Lemešonoka, 2017; Jaunzeme, 2011).

An employability factor is present in a person only if he or she possesses and actively applies career management skills; and in order to remain in the labour market, an individual must become the manager of his or her own career. However, many individuals, including pupils, do not master their career management skills, as evidenced by premature and ill-considered career choices after graduation from high school (Lemešonoka, 2017). If an individual does not have career management skills, he or she will not be able to pursue a successful career also later in life, not only at a young age, which may result in a prolonged transition period – unemployment. Jaunzeme (2017) confirms that the lack of employability skills is a problem for many unemployed people.

Thus, the concept "career" is interpreted as a conscious and successful career path or other areas of activity where achievement is possible. Career is a sequence of different socially important roles related to an individual's work, studies, self-expression and leisure activities. It can be said that career is a process that involves the development and expansion of all areas of life (including professional development) and leads to the success of life as a whole. From this point of view, career achievements (however high) that no longer continue cannot be considered as a career, and in this case, the talk about a career can only take place in the past tense (Lāce, 2014).

5 Process of Career Formation and Development in Childhood and Youth

The career development process is a continuous lifelong process of change, during which a person uses information about him/herself and surroundings for choosing an occupation, field of study, as well as a specific profession.

The career development process includes result- and development-oriented activities:

1. obtaining information on career development opportunities,
2. career planning,
3. career education,
4. career development support, for example, career guidance counselling,
5. determination of professional suitability,
6. acquisition of job retention skills.

When choosing an area of activity, the following conditions must be taken into account in order to succeed and feel good:

- the profession/ occupation must be interesting and engaging;
- the abilities, skills and experience must be appropriate for the chosen profession/ activity;
- one must be able to find work in this profession – to be able to work.

In order to identify a possible professional direction, it is necessary to get to know oneself, identify one's interests, abilities, skills and useful experience, explore the areas of interest, including where these professionals work, in what circumstances, what are their main responsibilities, areas of activity, possible remuneration. The next step is to model one's ideal employment, becoming aware of the factors important to this job. In order to build a career successfully, it is important to think and act actively, and promote purposefully the development of one's career (Jaunzeme, 2017).

Further, we want to disclose the career development in childhood and youth years. However, in order to get a comprehensive picture of the career development that takes place in all life cycles throughout a person's life, an overview of the dynamics of career development tasks in different human life cycles is offered (see Table 1).

Table 1. Dynamics of Career Development Tasks in Different Life Cycles

		Stages of life			
Tasks at each stage	Youth age (14-25 years)	Early adulthood (25-45 years)	Middle adulthood (45 - 65 years)	Late adulthood (65 years and over)	
Life tasks	Decrease	Time for a hobby	Participation in sports activities	Focus on the essentials	Working hours
	Persistence	The need to prove the current professional choice	The need to make the occupation safe	Keep oneself competitive	The need to continue what you like
	Formation	Starting activity in the chosen field	Stabilization of the professional status	Acquisition of new skills	Opportunity to do things according to wishes
	Exploration	Exploring new opportunities	Find the occupation you want	Identify new tasks for the job	Find a good way how to spend the retirement
	Growth	Develop your self-esteem	Learn to build relationships with others	Be aware of your own limits	To develop and appreciate the roles of non-professional life

(Gibson & Mitchell, 2006)

Career, like human development, is an indivisible and dynamic process that develops during all life cycles. Successfully solved career development task in one of the stages forms foundation for the next cycle. Of course, in the process of human development, stagnation can also be observed, but in all cases we are talking about certain tasks that a person performs for the development of his/ her career.

6 Career Development in Childhood (up to 12/13 years)

Career development in pre-school (1.5 years to 7 years) and in the first stage of primary education (7 years to 12/13 years) is based on the development of the “career readiness” concept (IZM, 2020). The task for career development support is to encourage children/ pupils to think, understand and develop their potential and readiness to succeed in the next levels of education. In adulthood, people are often unaware that their choice of profession has begun in their childhood, through exploring and adapting their abilities, interests, talents and personality traits to the demands of different professions, leading to a gradual awareness and career choices. Therefore, at this stage it is impor-

tant to organize and develop informative programs that introduce children/ pupils to different professions, including the future professions, and acquisition of skills useful for the future, providing the information on jobs and professional skills, enabling the children/pupils to learn more about different career paths (Taveira, Oliveira & Araujo, 2017) and gain a broader picture of the world (Harkins, 2001). Thus, it is important to choose well-thought-out, age-appropriate and relevant career development topics (Hidayat & Ningrum, 2017).

In pre-school and primary education, the most important career development support functions are related to the development of informative programmes. When providing information on professions to children/pupils, there is no reason to think that a pre-school child is too young for talking about a career. Deliberate and planned introduction of the child/ pupil to various career-related activities, events (such as excursions, meetings with professionals, research projects, etc.) develops transversal skills, including entrepreneurial skills, provides lasting knowledge and progressively develop expected competences in all aspects of the child/ pupil's development. Thus, the sooner a conscious career education is started, the child will have a relatively longer time to prepare, consider and explore various things that could facilitate and be useful in choosing one's career in the future.

In career development, it is also important to focus on identifying and developing the child/ pupil's potential. The child's potential develops in a research-based learning process ("child as a researcher"), inspired by child's curiosity (child's need). Curiosity is satisfied with the research activity and directs the child/ pupil towards the acquisition of information. In this process, the children choose to imitate their authorities, which become one of the most important sources of information (Chak, 2002). In turn, interests evolve from the use of information derived from research activities and observed role models. Starting to make career decisions, the child develops a perspective of time or a sense of future. As a result, it promotes the development of the child/ pupil's maturity or readiness for a career, when a child develops and improves the behaviour-controlling skills, self-management skills and cooperation skills (Sharf, 2006). Along with the development of self-image, a sense of future drives and develops a planned career decision. The development of self-image arises from the child's behaviour as a researcher, which provides information about professions, imitating the role models and fostering development of interests.

The teacher or career counsellor has a significant and direct impact on the child's career development in the future, although later on the teacher's influence is not always recognizable or identifiable. The introduction of an early career guidance system (career as a goal for the future) in pre-school and primary education allows the children to

understand their career opportunities and choose a future career path, adapting their talents, interests and personal qualities.

The “readiness for a career”, which forms the initial step in career development, moves to the next career development level – understanding of career, which goes hand in hand with the child/ pupil’s imagination of a particular profession, the preliminary decisions and choices that are based on a realistic assessment of a child and his or her environment. The child/ pupil will search for more information about this choice of his/ her career (profession), will express interest, will research, and will try out. Over time, the children begin to understand themselves and their competencies and begin to relate them to the work they are interested in, which allows them to make responsible career decisions later in life.

In providing career development support, the most important task is to strengthen a common understanding and career development planning at all levels of education, meaning that a purposeful career development support should be included in the pre-school and in the first stage of primary education. Ideally, career development is a continuous, sequential process in all levels of education (Sharf, 2006), based on career development programmes from pre-school to high school, emphasizing personal/ social learning, career development optimization, while building on the developmental challenges that are essential for each age group.

7 Career Development in Adolescence and Youth

This is a time when not only young people themselves pay special attention to their career choices, but also their parents and educational institutions. Therefore, we can talk about the influence of internal and external cognitive-emotional factors on the development of career choices in youth. Abstract thinking is a process that greatly facilitates the career planning. Getting older, the planning becomes sequential, and young people become more able to self-assess and imagine themselves in different situations. From this point of view, young people can more accurately see themselves doing a certain job than it was before. However, the logical thinking ability develops gradually, therefore youngsters still tend to be idealists, as evidenced by their beliefs that truth belongs to them and not to others.

Getting involved in the work process and choosing a job can help young people to become more realistic in their thinking. In gaining an understanding of reality, young people move through conflicts with parents and teachers. J. Piaget identifies this period as a time of slight unrest, but E. Erikson admits that youth is a time of identity vs. role confusion. Also, pupils’ physical development and exposure to the complex effects of

sexual decisions (premarital relationships, pregnancy, AIDS) can also affect their career development and their future lives. Young people also need to decide where they want to go: to take 'professional' route or go 'university' direction, or otherwise.

Development of interests. Adolescents are quick to realize that interests can change and that they can make different choices. They may be vague and not express interest in alternative choices because they know that there is still plenty of time to make career-related decisions. High school students are talking much more clearly and precisely about what they want to do and what are their interests. They may get excited about specific professions after watching a program on TV, or they observe the roles of their parents and their parents' friends. One may ask, "Is this what I would like to do?" However, the young people with poor sense of judgement are unable to assess the quality of their abilities.

Skill development. Awareness of the development of their skills is beginning to appear in 13-14 year old youngsters. Youngsters want to assess their skills much more carefully than they did before. They say, "Two years ago I wanted to be an athlete, but now I admit that I could never be competitive enough" or "I'm not sure I can be an engineer like my father – you know how hard Math is". It is important to recognize who is able to assess his/her own set of abilities (capacity) and who is not. It is difficult for young people at the age of 15-16 to decide on choosing a programme if they are not able to assess the capacity of their skills. Their choices are based either on their interests or on what their parents are telling them.

Value development. When making career decisions, 15-16 year old youths are able to set their own goals and values. They may not know how to evaluate and define their interests, capabilities and values, but they have the necessary "tools" for making the choice. They become more conscientious when they have to make a decision, and they can apply it to a complex world. Based on the development of cognitive abilities, the pupils can begin to think about such abstract questions as, "Is it better to make a lot of money or to help others?"

Career planning. The career planning is related to obtaining information and to diverse research activities, and also how young people are aware of, feel and understand different aspects of professions. When talking to young people about career planning activities during the consultation process, it is important to know not only what the students are doing, but also what the students think they are doing. At this stage, it is important to encourage thinking about practical and informative activities.

Career research. Willingness to explore or seek information is at the heart of career research. This process includes the students' readiness to use "resources" – parents, relatives, friends, teachers, counsellors, books, films, etc. Career research differs from ca-

reer planning. Career research is concerned with how much information students have obtained from a variety of sources, while career planning refers to thinking and planning for the future and is shaped by the use of resources. However, both career research and career planning focus on attitudes towards work. During the consultation process it is often revealed that students are reluctant to use the resources for obtaining information due to a variety of reasons. Therefore, it is the career consultant's job to find out the reasons for such thinking. Sometimes students are intolerant towards authorities and laws, and certain sources of values, such as parents and teachers. On the other hand, others might be afraid to use some resources because they are concerned if parents and teachers will take them seriously. Career research can be encouraged through a variety of activities, for example, by offering some period of time – a week, three months or any other length of time, for talking to the teachers and exploring books that contain professional information. By focusing on the attitude towards work, the counsellor can identify the next step in helping towards careers development of pupils.

Decision-making. This concept refers to the ability to apply knowledge and make a career plan in one's mind. In this developmental cycle, the pupils are in a situation when they watch others making career decisions and they decide which decision is the best. In general, if the pupils know how others make a career decision, they become more able to master the career decision-making process themselves. It is important to ask the pupils how they plan to make their career choices. Of course, some pupils will not be able to answer this question or say something like "I don't know, but I'll figure it out when I need to". However, it is necessary to explain this part of the career decision process and point out the erroneous answers of pupils.

Information about employment. The information about employment contains two basic components. The first relates to the knowledge of how other people describe their interests and abilities, how others learn and obtain information about their professions, and why people change their employments. The second part of this concept includes the knowledge on job related responsibilities in different areas of activity as well as about behaviour at work. Some pupils have incorrect information on how to get a job and how to behave in the job search process, as the information is often obtained inaccurately from TV or movies. Therefore, it is important to develop understanding and correct the inaccuracies in pupils' understanding about the world of work.

Career guidance. The career guidance package provides a simple summary of the following sections: career planning, career research, career decision-making and information about the world of work.

Identity and context. Professional identity can appear in four developmental states that young people go through: diffusion, moratorium, foreclosure, achievement. Diffusion

refers to the existence of some clear ideas about what a person wants, but it is without any interest in the future. A moratorium is a time (often more than a few months) during which a choice, which is not clear yet, is explored. Foreclosure refers to making a conditional choice in favour of the beliefs of others, and it is often based on specific, successive family traditions without exploring other options and choices. Achievements refer to conscious knowledge, aspirations and the development of a specific plan for achieving professional goals. Based on these professional status indicators, F. Vondracek uses simple statements for explaining each professional identity status.

- Diffusion – I don't know what I want, what will happen – will happen.
- Moratorium – I do not know what I want, but I would like to find out.
- Foreclosure – I know that I know what I want, and I follow a certain path (for example, a parent's profession).
- Achievements – I know what I want and I am already planning for it (Vondracek & Skorikov, 1997).

Participation in counselling process. It is important that a counsellor is able to provide a range of opportunities for young people for planning their career choices. When promoting career planning, it is necessary to encourage the search for resources for obtaining career-related information both from different sources and by testing one's strength in the field of interest. It is important to discuss the wide range of information sources, as magazines, films and TV sometimes give a stereotypical picture of professions.

It must be remembered that young people can demonstrate a certain egocentrism in the assumption that "I am right, others are not". The youngsters often have a limited time perspective and they find it difficult to imagine themselves 5-10 years ahead. Therefore, in the context of this article, it is important to explore the transition period of young people *from education to employment* providing its description.

The first decades of the 21st century show that the relatively linear world of work has changed at an unprecedented pace, and the nature of work has also changed completely – automation has been widely introduced, outsourcing, many fields get eliminated due to scientific progress and new technologies, robotics is widespread as well as artificial intelligence. Those people, who are *on the wave of technologies*, are trying to respond accordingly, but as a result of globalization and the triumph of new technologies, for many individuals the aging and disappearing technologies and entire industries can pose challenges, even breaks in their careers, requiring re-engagement in career exploration and making new career choices. As shown by statistics, people choose, or they are forced to work for different employers in different jobs throughout their lives, as well as resume their studies: the transition from education to employment, especially in recent years, has become longer and significantly more unpredictable; young

people change jobs more often, and it takes longer for them to establish themselves in the labour market, either out of choice or necessity (ILO,2016). Also Roberts (2009), the developer of opportunity structure theory, states that the transition from education to employment is lengthening among young people, and that almost all young people are trying out a number of choices.

The world of work of the 21st century – the age of globalization is precisely described in the UK study “The Future of Work: Jobs and Skills in 2030”: the idea of obtaining one education followed by a one single career that ends in one retirement has become the past, as information technologies will continue to penetrate any work environment. Technologies and disciplines will converge, enabling important innovations to flourish (The Future of Work Jobs and Skills in 2030, 2014). Work and organizations will be constantly flowing as people move from a project to project, and today’s employees, and even more so future employees, can expect multiple changes of jobs, they will work in several organizations and experience periods of unemployment and underemployment. Some of these situations will be employee-initiated, while others will be imposed from above and result from redundancies, restructuring and outsourcing policies. As a result, employees will find themselves in an ‘unfamiliar’ world of work, facing a complex range of issues for which many will be ill-prepared. Due to the rapid changes of the roles of professionals and the potentially short duration of singular employment, the 21st century employees are required to constantly update their skills (Amundson, 2005). At present, rapid climbing of the career ladder is often replaced by winding the career paths.

It also takes longer for young people to establish themselves in the labour market because the work relationships nowadays have become more profit-oriented, competitive and dynamic. And when it comes to job security, currently it can only be applied to the marketable skills of an individual, and neither to seniority nor paternal guardianship; and the times, when a new employee with a basic education starts working in a company, learns everything possible in the profession and lives and works happily till the end of his/her life, remain in the past (Knowdell, 1996).

As early as in the middle of the 20th century, Ginzberg (1984) spoke of young people as an age group, which is forced to start making career choices that youngsters are most probably not yet ready to accept. Ginzberg emphasized that society must take into account that an individual, who has graduated from school and is forced to start making career decisions, continues to develop both emotionally and physically, and that young people are forced to make career decisions when they are mature the least.

Nowadays, new patterns are emerging for young peoples’ transition from school to work. Traditionally, most young people started employment only after completing their studies and rarely combined education with employment. At present, the transition from

school to work has become less distinct, as evidenced by the growing proportion of students who work alongside their studies, as well as the growing number of employees who start their studies parallel with their work (ILO, 2016) Even if a person is engaged both in further education and employment, it is not guaranteed that the youngster has successfully overcome the transition from education to employment, as a relatively large number of young people decide to drop out or discontinue their studies – many drop out in first or second year, or decide in favour of a gap year in order to decide what to do next.

Dorila (2017) emphasizes the importance of transition periods, stating that transitions are linked to the factors that radically change the life experiences, such as transition from childhood to adulthood, and so on. The transition from one stage to another can have long-term effects on life, especially for children from disadvantaged social environments; therefore, the current transition systems should look for ways to balance the inequality of opportunities.

Questions for reflection:

1. How can you reflect on the development of your own career?
2. What challenges have you faced in your career development?
3. How can you reflect on your experience in the context of the theory presented in this chapter?

Questions for discussions:

1. What areas of human development make up a career?
2. How do changes in the labour market affect career development?
3. How to promote the development of employability skills?
4. How is career development in childhood and what imprints does it leave on future career development?
5. What are the essential features of career development in youth?

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Theme 2

Pedagogies for creative learning and education

Chapter 2.1

The Creative Curriculum

Abstract:

This chapter aims to report real success stories of artists-entrepreneurs who have turned their creativity into an active business. Inside the chapter are reported four success stories collected and told through a questionnaire with key questions useful to trace the individual paths taken by the participants. We want to provide practical examples of problems, challenges, accidents, training and successes that each interviewee has encountered in his or her life in order to provide real-life stories and situations to give the reader not only a theoretical but also knowledge of how to manage the difficulties that may be encountered during a path of growth on issues of interest to those who read this ebook.

Keywords:

Interview; artist; creative; entrepreneur; success; story; practical

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Chapter Structure:

1. Introduction
2. Ada Montellanico
3. Mirco Magnani
4. Valentina Bardazzi
5. Emiliano Degl'Innocenti
6. Conclusions
7. References

1 Introduction

As Ray & Meyers (1989) suggested, business is actually a very creative form of art. It integrates creativity and imagination (business plans and ideas), people skills, organisational skills, and requires a focus and drive that many artists possess.

Creativity is used to provide a concrete response to the many complex problems that arise, and in organizations it takes on basic characteristics that can be summarized in a few key points (Cocco, 1998):

1. it manifests itself in socially organized and institutionalized contexts;
2. it is expressed within a specific field of action;
3. there is a common orientation of individuals and groups toward the “scientific spirit,” i.e., curiosity, willingness to confront, thirst for knowledge and a good dose of ambition, understood above all as a challenge to one’s abilities;
4. there is a substantial finalization of activities, in terms of objective commitments and subjective dedication.

The individual’s creative ability to make ideas fruitful on the one hand and the entrepreneur’s ability to make them fruitful and productive on the other hand, represent the combination that enables firms to position themselves in the market and compete with highly integrated systems (Filippelli, 2008). In the 1980s, Michael Ray and Rochelle Myers, researchers at Stanford University, focused on management, rather than product, and designed a course on the impact of creativity in business. They based their research on the assumption that since creativity exists, there must be ways to make it useful in business. They relied on numerous testimonials from successful entrepreneurs from a wide variety of industries, and in 1986 they published a kind of decalogue of managerial creativity (Filippelli,2008):

1. Business is art. One must find logic, order and coherence among elements from chaos.
2. Do not stop at the first attempt, but persevere and have confidence in creativity.
3. Destroy criticism and create curiosity.
4. Pay attention, learn to perceive, to see, to listen.
5. Ask quirky questions, so as to be able to bring out a new problem or make it perceived from different angles.
6. Do only what is most congenial, pleasant and effortless and not insist on activities perceived as difficult, boring and depressing.
7. Eliminate all causes of stress by devoting in a balanced way to work, family and oneself.

8. Be a decision maker, weighing the pros and cons and sensing the right path to take.
9. Be oneself, believing in one's own abilities and facing challenges successfully.
10. Finally, live in the world without becoming absorbed in it.

In this chapter we report the interviews of four individuals with a strong creative sense (artists, singers, sculptors, painters, musicians) who tell through their testimony the relationship between entrepreneurship and creativity, the main themes of the project, in their personal experience. The artists were chosen because they were part of the network of entities orbiting CSCS Group. Among other activities such as the Erasmus+ program for students, CSCS has been engaged in the past in the management of Melos, a music centre owned by the municipality of Pistoia. Within this centre, CSCS provided the development and organisation of cultural activities which allowed the organisation to contact the artists chosen for the interviews. Regarding each artist, the reader will find additional information about their work in the form of websites URLs. It is sufficient to click on any of the URLs to access the information.

The following open questions guide the contributions of the individual interviewees in sharing their successful experiences through their stories:

1. When did you decide to be an artist? And through what path?
2. What difficulties have you faced in your artistic journey that you consider both formative and have allowed you to make significant progress in your artistic career?
3. What are the most important successes you have achieved in your journey, how did you get there, and how have they shaped your story? Provide practical examples
4. Knowledge exchange methodologies: How do you keep up to date? How do you share knowledge and skill updates with other artists/colleagues? Provide practical examples
5. Speaking to aspiring young artists, what suggestions, advice, recommendations would you make?

2 Ada Montellanico

The first person whose interview we report on is Ada Montellanico, singer, musician and songwriter, is recognised as an excellence in the jazz scene, thanks to a career always inspired by the search for high artistic quality and always innovative paths. artistic quality and innovative approaches.

She has collaborated with internationally renowned artists such as Jimmy Cobb, Lee Konitz, Paul McCandless, Enrico Pieranunzi, Enrico Rava, Fabrizio Bosso, Danilo Rea, Renato Sellani and Renato Sellani, Giovanni Falzone, Walter Booker, Jimmy Heath, Massimo Nunzi, Gianni Oddi, Diego Da Silva, participating with critical and public success in numerous success in numerous prestigious Italian and foreign festivals.

She has published 12 albums under her own name and has appeared as a guest in numerous CDs by other artists, she has written for *Stampa alternativa* "Quasi Sera, una storia di Tenco", a highly successful essay on the Piedmontese singer-songwriter.

References and more information on Ada Montellanico:

- <https://www.facebook.com/adamontellanico>
- <https://www.facebook.com/ada.montellanico.9/>
- <https://www.instagram.com/montellanicoada>
- https://www.youtube.com/watch?v=VbzXYJ9_IH0
- <https://www.youtube.com/watch?v=wkCQsB7rITI>
- <https://www.facebook.com/adamontellanico>

Here is her interview:

1. When did you decide to be an artist? And through what path?

Actually, it is difficult to identify a moment when you decide to be an artist. It is a journey, a growth, an expressive need that grows day by day, year by year. I soon discovered a strong predisposition and attraction towards music, singing and rhythmic pulsation. I started singing early, fascinated by the study of ethnomusicology at university, I started singing in a popular music group and giving concerts.

I studied singing and tambourine and could play like a real percussionist. Then I abandoned this type of music: I was struck by jazz music, which I approached by listening to John Coltrane.

A friend of mine played me the wonderful record 'My Favourite Things' and I was completely stunned and fascinated. In particular, I was very impressed by Coltrane's sound, his expressive vehemence, creativity, imagination and the freedom of this musical expression.

So I started playing soprano sax for a while, but then I decided to go back to my first love, the search for vocality. So I started attending the vocal jazz workshop at the Scuola popolare di Musica di Testaccio in Rome and my first experiences and collaborations began.

At that time I rehearsed daily with a young and talented pianist and with him I built my first repertoire. My preference has always been to discover unusual repertoire,

new, lesser-known and rarely performed songs, and so I began to outline my artistic physiognomy.

2. What difficulties have you encountered in your artistic career that you consider to be instructive at the same time and that have allowed you to take steps forward in your artistic career?

I found few difficulties at the beginning of my journey, but the most frequent was certainly overcoming the preconception that many musicians had, and unfortunately still have, towards female singers, who have always been considered not as musicians, but as people with a beautiful voice that mother nature has given them, but who know almost nothing about music, harmony, rhythm and improvisation.

A real prejudice combined with the fact of being a woman. For thousands of years, due to cultural problems, women have always had to prove that we can do more than men, and do it well. I have had to struggle to overcome all these difficulties. I developed my artistic career by focusing on originality, starting with research into the sound of my voice and my expression, and then focusing on the originality of the repertoire I performed.

I was interested in finding new songs that could also match my sensitivity in their lyrics, to tell stories with contents that were also mine. This need of mine, first of all, aroused the curiosity and interest of the musicians with whom I collaborated, and at the same time it set me apart from the vast panorama of singers who populated the world of Italian jazz. I had a strong need to find my own identity and my own style, and this certainly allowed me to emerge early on in the music scene.

3. What are the most important successes you have achieved on your path, how did you get there and how did they influence your story? Give practical examples

Fortunately, I had important successes right from the start, working with great artists such as Enrico Pieranunzi, Enrico Rava and Jimmy Cobb.

Enrico Pieranunzi and I had a long artistic association and his appreciation and encouragement helped me to grow and make a name for myself in the musical world.

The meeting with Jimmy Cobb, a milestone in world jazz, Miles Davis' drummer in his golden years, was extraordinary and extremely instructive for me.

Even though it can be frustrating at first, I believe that you can only grow by collaborating and being alongside great artists: having a model of creativity and musical stature close to you was an enormous stimulus for me to study and find my own way more and more.

However, what has been most important in my career was my love of risk and challenge. More than once I found myself offered musical projects that were far from my own path, such as the proposal by a record company to record an album on Luigi Tenco. At that time, I was studying and developing my knowledge of the Afro-American repertoire and I was certainly not attracted to Italian songwriting, but the idea intrigued me and I accepted the challenge motivated by great curiosity and the desire to try my hand at new material. I was rewarded because that record opened up an important avenue for me and I was recognized by the critics as the 'initiator of vocal jazz in Italian'.

4. Knowledge exchange methodologies: How do you keep yourself updated? How do you share knowledge and skill updates with other artists/colleagues? Providing practical examples

The greatest upgrade a musician can receive is simply and purely listening to music. Listening to music that is 'different' from your own preferences. I am not only referring to singers but also to musical languages that are far removed from your training and personal liking.

I keep myself informed through specialized jazz music magazines so that I can get to know other expressions, new records and emerging artists at an international level. But above all, when I can, I try to go and hear all the concerts that intrigue me and musicians that are unknown to me. Very often there are extraordinary surprises when you go looking for artists you don't know very much about, and you need to keep your curiosity alive.

At the same time, I maintain a fairly continuous exchange with fellow musicians, teachers, in order to keep up to date on new methods, manuals, books related to jazz, music in general, but also poetry and non-fiction. Having a broad cultural background is therefore, in my experience, of vital importance.

5. What suggestions, advice, recommendations would you make to aspiring young artists?

The most important goal is to strive relentlessly for one's own artistic identity, one's own voice, one's own sound. We are billions of people, we all have a face, two eyes, a nose, a mouth, but we are all different, so every voice is different and every expression must be different.

The advice I give is to always try, to experiment, to risk, to go beyond one's own boundaries and limits to seek and find one's own voice, one's own sound, one's own original identity. You have to dig deep inside yourself and look for your essence to understand who you are and what you want to express through your art.

Another piece of advice I would like to stress is to have the ability to work as part of a team: in music, for example, a soloist can be exceptional, but he or she will be even more so if he or she is able to build a close and sincere relationship with the other musicians in the group.

A further fundamental element is to get hold of and use techniques to express oneself and not for a mere display of virtuosity. What counts are emotions and heart as well as finding originality in the search for musical material. There is a universe to be discovered, only in continuous research and experimentation can one find hidden treasures that can enrich one's knowledge and artistic stature.

3 Mirco Magnani

Mirco Magnani (1961 – Pistoia, Italy), is an Italian Berlin-based music composer and producer, co-founder of Minox, Technophonic Chamber Orchestra and 4DKiller.

Since 1984 he has produced music and mixed-media events with the band Minox. In 1996, he co-founded the independent record label Suite inc. running it until 2006. Mirco has worked for his label releases, as well as performing on-stage with Steven Brown (producer of Minox "Lazare" 1986) and Blaine L. Reininger of Tuxedomoon, Lydia Lunch, Krisma, Mad Professor and has been remixed by Murcof, Nobukazu Takemura, The Gentle People, Daedelus.

In 2000 he was co-founder of Suitevision, a sub-label that was dedicated to images and visuals then he focused more and more on videoart combining it with soundscapes. In 2006 Mirco started his solo moniker T.C.O. with "Decompositio Sonata", an A/V for a reinterpretation project of 20th century classical music composers. In 2009 he moved to Berlin and since 2010 for some years, Mirco has broadened his horizons to include organising events. A new collaboration called Undogmatisch was launched in 2012 with painter and partner Valentina Bardazzi. That project was realized as an art-event with an exhibition space/AV live shows, djs and which then transformed into a label in 2016.

Then another collaboration started for the concept album by Mirco Magnani with the eclectic opera singer Ernesto Tomasini, "Madame E.", a free reinterpretation of Georges Bataille's short novel "Madame Edwarda". About the production of Carlo Domenico Valyum's release "Cronovisione Italiana", Mirco is the conductor and curator, with the help of Valentina, of that research on sound and video reprocess, presenting a creation from reanalysing excerpts of cult Italian television broadcasts from the 60s until the 80s.

Then collaborative improvisation sessions with the polish berliner friend Lukasz Trzcini-

ski: “Lumiraum” and “Lumiraum Appendix”, a collaborative track with Andrea De Witt for the compilation “Magnum Opus Collectio Series: NIGREDO” (UNDOGMA6) titled “Orion-grad” as a preview of the album with Andrea titled “Toretam Tor” (UNDOGMA7).

DISCOGRAPHY

- 2021 MIRCO MAGNANI / ANDREA DE WITT – Toretam Tor - Digital Album - Undogmatisch
- 2020 MIRCO MAGNANI + LUKASZ TRZCINSKI – Lumiraum Appendix – Digital EP - Undogmatisch
- 2019 MIRCO MAGNANI + LUKASZ TRZCINSKI – Lumiraum – mLP - Undogmatisch
- 2018 CARLO DOMENICO VALYUM - Cronovisione Italiana - 2xLP/VHS/CD - Undogmatisch
- 2017 MIRCO MAGNANI + ERNESTO TOMASINI - Madame E. - 2xLP - Undogmatisch
- 2014 MAGNANI|NITTI - Uno – Digital album - Brusio
- 2010 T.C.O. - The Die – Digital EP - The Centrifuge
- 2009 T.C.O. - Titles - CD - We Play!Rec
- 2008 MINOX and LYDIA LUNCH - U Turn - CD/12” reissue + 2 bonus track - Suite inc.
- 2008 MINOX - Lazare - CD reissue + 2 bonus tracks - Suite inc.
- 2007 T.C.O. - Bianco|Flexo|Zbub - 12” - IT’S
- 2004 TECHNOPHONIC CHAMBER ORCHESTRA - Nemoretum Sonata - CD - Suite inc.
- 2001 MINOX - Downworks - CD- Suite inc.
- 2000 4DKILLER - Sex, crimes and toys - CD - Suiteque
- 1998 MINOX and LYDIA LUNCH - U turn - CDs - Suite inc.
- 1998 TECHNOPHONIC CHAMBER ORCHESTRA - Beats and movements - CD - Suite inc.
- 1994 MINOX – Plaza - CDs - Suite inc.
- 1986 MINOX – Lazare - mLP - ID Lacerba
- 1984 MINOX – Suite Maniacal - 7” - ID Lacerba

COMPILATIONS

- 2022 MIRCO MAGNANI + ANDREA DE WITT / DINNER SITUATION – Magnum Opus C. S. Albedo - Digital Album - Undogmatisch
- 2021 MIRCO MAGNANI + LUKASZ TRZCINSKI / MIRCO MAGNANI + ANDREA DE WITT – Magnum Opus C. S. Nigredo - Digital Album - Undogmatisch
- 2019 MIRCO MAGNANI - LB/E La Bellezza Eccetera – Cassette - Lacerba
- 2016 MIRCO MAGNANI - Touched 3 - Digital – Touched Music
- 2014 MINOX - At The End of Modernity - LP . Lacerba

- 2013 T.C.O. aka Mirco Magnani w/ Stella Veloce. - Moments of Inertia – Digital – The Centrifuge
- 2008 T.C.O. - SnobNight Sessions – CD – VideoRadio/Rai Trade
- 2002 AA.VV. – Suitable#3 The downbeatniks - CD - Suiteque
- 2001 AA.VV. – Suitable#0 The psycho lounge collective - CD - Suiteque
- 1996 AA.VV. – B movie show - CD -Suite inc.
- 1993 MINOX. - Vox Pop 1993 - CD - Vox Pop

VIDEOGRAPHY

- 2014 “3RDEYE” – video installation
- 2014 “Requiemcratia” – video installation
- 2013 “Corpus 2.2” – video installation
- 2012 “3,14” – video installation
- 2011 “Etudes pour Madame E.” - AV
- 2010 “Mio Son Tuo” - video installation
- 2009 “Lux, Luxus, Luxuria” - video installation
- 2009 “Corpus 2” – video installation
- 2008 “Corpus” – video installation
- 2008 “Parenthesyne Suite” – video installation
- 2006 “Decompositio Sonata” – AV

SOLO EXHIBITIONS (w/ Valentina Bardazzi)

- 2014 “Requiemcratia” - Cross Art Gallery, Berlin
- 2012 “Real Dream” – MILKandLEAD Gallery, London
- 2011 “Mio Son Tuo” – Zero Arts e.V. - Stuttgart
- 2010 “Mio Son Tuo” - Tatau Obscur - Berlin
- 2009 “Untitled for Parenthesyne Suite” - FMAB, Berlin

GROUP EXHIBITIONS

- 2017 “Fensterflügel” - Ventilator, Berlin
- 2015 “Nude” - The Ballery, Berlin
- 2014 “C.A.R.” Medien/Foto Kunstmesse, Essen
- 2013 “Undogmatisch 3” – Urban Spree Gallery, Berlin
- 2012 “ArtWiki” - 7th Berlin Biennale for Contemporary Art, Berlin
- 2012 “8th Directors Lounge Festival” – Naherholung Sternchen, Berlin
- 2011 “Erweiterter Freundeskreis”- PremArts - Berlin
- 2010 “A Tree Full Of Birds” - Formwerk (Art Zone) – Eskiltsuna (SE)
- 2009 “25p” - Niagara, New York
- 2009 “TEASE Art Fair 03” - Köln

References and more information on Mirco Magnani:

- <https://undogmatisch.bandcamp.com/music>
- https://soundcloud.com/mirco_magnani
- <https://www.mixcloud.com/tcomircomagnani/>
- https://instagram.com/undogmatisch_berlin/
- <https://www.facebook.com/tcomircomagnani/>

Here is his interview:

1. When did you decide to be an artist? And through what path?

I decided to start being an artist without actually deciding to do it though it was more of a personal need than a real decision.

I was about 17 years old and my choice came about because of my strong desire to learn to play an instrument. At the beginning I didn't go to any experts, as very often happens to young people of that age, so I started my experience as a self-taught beginner playing a guitar.

Over time, however, I needed to take private lessons from a professional, using instruments such as classical guitar, clarinet and finally piano and harmonica. The use of different types of instruments with different sounds was also useful in developing my interest in more specific genres such as electronics and also in getting me interested in sound design.

Like for all things, I believe that one becomes an artist by gravitating around various interests that can compensate for what one discipline alone is not enough; I am against specialisation but rather believe that enriching our artistic/cultural background is necessary even if it obviously requires a greater commitment over time.

2. What difficulties have you encountered in your artistic career that you consider to be instructive at the same time and that have allowed you to take steps forward in your artistic career?

We all know how difficult an artistic career can be in general, especially when you decide to work in experimental fields or outside of the common canons. Moreover, living in a provincial town outside the official circuits has certainly not helped things.

Therefore, if in spite of these or other difficulties one resists, so to speak, the economic and commercial temptations that pollute the pure idea of art, somehow the artistic expression that emerges remains pure, sincere and full of content.

The difficulties become exams to be faced in order to reach a high level of consciousness and awareness of our real goals. A sort of initiation.

But we have to know what we really want from ourselves. In practice, we must always be accompanied by a question: how much of the idea we pursue is really ours?

In certain artistic fields there are software programs that offer better and better performances, but at the same time they create uniformity and depersonalisation, so it is always easier to create a work of art, but increasingly difficult to personalise it, to give it a soul. I think that in today's world, this is precisely the greatest difficulty: being able to make art, to emerge, while maintaining one's uniqueness and not falling into the temptation of uniformity.

3. What are the most important successes you have achieved on your path, how did you get there and how did they influence your story? Give practical examples

The idea of success changes over time. When I was young, I had an idea of what I considered success, but today my idea has probably changed completely.

Despite this, I can say that I have undoubtedly had personal satisfaction and gratification that have certainly enriched my personality and artistic sensibility.

Undoubtedly, the conviction of following a high goal pushes you to do things you would not otherwise do: An example of this is always finding time to follow your interests despite school or work without making any sacrifices, except maybe sleeping a little less (although when you are young this is not a big problem).

I have always dared a little more, for example by trying to have the opportunity to collaborate with artists I have always respected and who have given a lot to enrich my soul. So, in my experience, I don't think the hunger for success is the right stimulus. I think this applies to all artists in general. Rather, I believe that following a conceptually high, almost spiritual goal is the way to achieve success, which, in my opinion, is a concept perceivable by one's own sensitivity rather than defined by others.

4. Knowledge exchange methodologies: How do you keep yourself updated? How do you share knowledge and skill updates with other artists/colleagues? Providing practical examples

Today, compared to a few decades ago, there are many more tools at our disposal with which we can communicate and dialogue through various forms. However, in my opinion, the same problems remain: how to identify and choose the right sources of information on the one hand, and how to select a network suitable for sharing a certain type of information on the other.

For example, in the 1980s, to find a record of an alternative genre to the Italian or pop

music of the period, you had to go to Milan or Rome or have them sent to you, and you could only find out about it if you followed the specialised press.

Nowadays, you can find anything on the web, and this, while on the one hand giving us access to a great heterogeneous artistic wealth, on the other, means that we often don't invest time in looking for something different, something minor, that is not in the official channels. Basically, in my opinion, what we would really like to discover, to know, often does not coincide with what the official market offers.

5. What suggestions, advice, recommendations would you make to aspiring young artists?

After careful consideration, I don't think I can give any specific recommendations or advice to those who will read my interview. I can only say to always listen to one's personal passions, one's interiority, which represent our deepest and truest part. Forget about the trends of the moment, the fashions that the art world throws at you.

My thoughts can be summarised as follows: A personality that is different from others is difficult to dress, but it has its advantages if you dress it with conviction and nonchalance.

And anyway, for me being an artist means above all having the possibility of using a tool that can help me, and has helped me, to face the various moments of life, maintaining an integrity of thought and trying in some way to develop and strengthen this integrity day after day.

4 Valentina Bardazzi

Valentina Bardazzi (1974, Prato, Italy) received her education at several art institutions in Florence and Pistoia, Italy. From 2002 onwards, she works as an independent artist and lives and works currently in Berlin. Valentina explores the human body with the idea that what makes people beautiful is what makes them stand out from others; through their anguish and pain, through their mistakes, through their craving for happiness. These experiences have an effect on how we perceive ourselves, and thus how the outside world perceives us. This is what connects us universally, yet is what also creates our individuality.

Statement

"The disease and the body have often been the protagonists of my works. I'm attracted by the rarity of an aesthetic body, so I think the beauty lies in the rarity, the exception of

genetic anatomy that manifests a unique aesthetic code. I'm interested in the body that comes out of the majority, which is known for its diversity, regardless of how positive or negative it is. Beautiful or ugly adjectives are dictated by the laws of morality and the customs of the time and place; they are always changing, there is no absolute standard of beauty. The theme of childhood is often recurrent in my works as well. Children who draw, are drawn primarily from medical images or books of childhood diseases. I care about the image that creates a sensory short circuit... It seems one thing but instead is another. The image that attracts and repels at the same time."

Education

- 1997 - 2002 Accademia di Belle Arti of Florence
- 1995 - 1996 International School of Comics and Illustration of Florence
- 1990 - 1995 Master at Istituto d'Arte Policarpo Petrocchi, Pistoia

Solo Exhibitions

- 2017 "Bardazwischen" Projektraum Ventilator 24, Berlin
- 2016 "Organiche Geometriche" The Ballery Gallery, Berlin
- 2015 "Parallel Sensation" The Ballery Gallery
- 2014 "Requiemcratia" Atelier Cross Art, Berlin
- 2013 "Ego Sum" Xlab Corrosive Art Farm, Berlin
- 2012 "Real Dreams" MilkandLead Gallery, London
- 2011 "Natura Obscura" Aka Gallery, Berlin
- 2011 "Mio Son Tuo" Zero art e.V., Stuttgart
- 2011 "Mio Son Tuo" Tatau Obscur, Berlin
- 2009 "Untitled for Parenthesyne Suite" FMAB, Berlin

Group Exhibitions

- 2019 „Immagini Selezionate di Morte e di Vita“, Viabuonfanti42, Pistoia
- 2018 "Trans 01", Fantom Art, Mexico City
- 2017 "White Love", The Ballery, Berlin
- 2017 "Art & Environment" (charity event for Green Peace), Fellini Gallery, Berlin
- 2017 "SuperPawer Woman Show" Projektraum Ventilator 24, Berlin
- 2017 "50 Contemporary Artist + the Enter Art collection, E A F, Berlin
- 2016 "Liberating the Female Spirit", Fellini Gallery, Berlin
- 2016 "E A F Pop up Exhibition" Messeturm Basel
- 2016 "E A F Berlin Art Week, 50 Contemporary Artist" Berlin
- 2016 "Skin" The Ballery Gallery, Berlin
- 2015 "Nude" The Ballery Gallery, Berlin
- 2014 "Winter" The Ballery Gallery, Berlin

- 2014 “Wake up from this dream”, The Ballery Gallery, Berlin
- 2014 “Mater Materia”, La Ultima Cena, Berlin
- 2013 “Undogmatisch”, Urban Spree, Berlin
- 2011 “Erweiterter Freundeskreis”, PremArts, Berlin
- 2010 “Amsterdam Art Fair”, Morren Gallery, Amsterdam
- 2010 “A Tree Full of Birds”, Formwerk (art zone), Eskiltsuna (SE)
- 2009 “25 P “ @ Niagara, New York
- 2009 “Tease Art Fire 03”, Koln
- 2009 “Supermarket Art Fair”, Clarion Hotel, Stockholm

Album Cover Illustrations

- 2018 - “Madame E. Réinterprétations et Remixes (Vinyl) “Plaisir” par Ken - Karter
- 2017 “Madame E.” (Vinyl) Mirco Magnani + Ernesto Tomasini
- 2015 “Inner 8” (Vinyl) Inner 8
- 2015 “Ignominious Atonement” (CD) Putridity
- 2013 “Selbstmord” (Vinyl) Petra Flurr + Modernista

Publications

- 2015 “Utopia Dystopia”, Tokyo
- 2014 “Neroblio # 3”, Berlin

References and more information on Valentina Bardazzi:

- <https://www.enterart.com/artists/valentina-bardazzi/>
- <https://www.fellinigallery.com/artists/valentina-bardazzi>
- <https://instagram.com/bardazzivalentina?>
- <https://www.facebook.com/valentinabardazzi1>

Here is her interview:

1. When did you decide to be an artist? And through what path?

I have always been attracted to art and creativity as a means of expression since I can remember. Throughout my experience, I have been passionate about and then specialised in drawing and painting.

This type of art is the one that, in my opinion, allowed me most of all to create imaginary worlds: for me, the image has a great power of communication and is, like all the purest arts, universal. I don't think you can say that a person chooses to be an artist, but rather that a person chooses to pursue what is already intrinsic in the human being: creativity.

Therefore, I think being an artist is not so much a decision but a discovery. As I have progressed on my artistic path, I have realised that painting is more of a way of “self-

care” for me than a profession. I began my journey by attending various art schools: the Art Institute in Pistoia, then the Academy of Fine Arts and a course in illustration and comics in Florence.

2. What difficulties have you encountered in your artistic career that you consider to be instructive at the same time and that have allowed you to take steps forward in your artistic career?

Among the many difficulties that an artist may encounter on his or her path, the most difficult thing is, in my opinion, constancy. It can be difficult to continue being an artist and believing in what you do regardless of success or sales. Valuable art is in my opinion above all communication and healing, it is not economics.

Thus, the difficulty lies in finding the necessary time to freely experiment with one’s own ideas without letting them be polluted by marketability, which only distances the creation from its original value, to get lost in the myriads of copies according to the trend of the moment.

Art needs time and devotion otherwise it becomes a hobby. My experience has led me to understand that art enriches the awareness of the value of existence and that it must necessarily go beyond commercial value.

3. What are the most important successes you have achieved on your path, how did you get there and how did they influence your story? Give practical examples

Successes are measurable in retrospect in my opinion: an episode, a fact that changes the direction of your life, even from an artistic point of view. What I would call a success, in my case, is precisely the fact that I moved to Berlin in 2008.

This city is alive and creative on an international level and has given me the opportunity to exhibit my works in various parts of the world. Berlin gave me the opportunity to achieve success: its international exposure to artists of all kinds allowed me to create and amplify an artistic network, albeit underground, of people working in the same field as me.

Changing cities has given me the opportunity to confront myself with other dimensions and perspectives that have enriched me and continue to enrich me with experiences that are necessary for a valid artistic process. Synthesising a suggestion for the readers of this interview, I would therefore say that success is also dictated by our choices and immersing ourselves in contexts rich in art and artists is in my opinion a winning factor.

4. Knowledge exchange methodologies: How do you keep yourself updated? How do

you share knowledge and skill updates with other artists/colleagues? Providing practical examples

As I said in the previous answer, the network of artists that you create over time is fundamental. I am lucky enough to have many artist friends, with whom there is first and foremost a relationship of friendship. With some of them I have even collaborated on various collective exhibitions.

As I said before, living in Berlin gives me the opportunity to meet people who have the same interests as me, which makes me feel part of a community where I can compare and get feedback continuously and this is stimulating because it gives me the opportunity to conceive new creations and, answering the question, it gives me the opportunity to stay updated in real time in my artistic field.

5. What suggestions, advice, recommendations would you make to aspiring young artists?

What I can recommend to those who want to embark on an artistic-entrepreneurial career is not to think about the economic side, which in my opinion is consequential.

I suggest, first of all, to be extremely sincere with yourself and to bring forward only what is intimately personal and true and not to follow the various fashions or currents that can also mislead and distant from the original message that pursues the art in all its forms: In art, as in many other areas, there are very few originals and many imitators, maintain and be able to show their originality and the goal to follow for those who want to pursue this profession in a serious manner.

5 Emiliano Degl’Innocenti

Emiliano Degl’Innocenti is an Italian blues guitarist and singer. He was born and grew up in Pistoia, Tuscany, where the best-known blues festival in Italy is held every year in July. His early passion for the blues came from the old records he found in his parents collection and the will to play guitar from the Blues Brothers movie and of course the enthralling sounds of the festival at the heart of his hometown.

His Tuscan stage experience began almost 30 years ago and extended to Italy and Europe. As an up-and-comer he sang enveloping Mississippi Delta blues but quickly evolved towards a personal blend of traditional and scratchy funky sound tinged with R&B and groovy beat, thank to the inspiration and guidance from many different musicians of different styles and instruments: Bukka White, Big Jack Johnson, David Hidalgo, Wes Montgomery, Phil Upchurch, Steve Cropper, Jimmy Smith and others.

Degl'Innocenti performed live as a guitarist with Eddie Floyd (Knock On Wood), with The Miracles and with Ben E. King (Stand By Me) and many other artists, including the long collaboration with Guitar Crusher.

He's been recording with several local artists and his last album is Shake Your Bones recorded with his band the Magic Bones.

As a teacher and organiser, he started the Dancing the Blues festival, a series of happenings and workshops meant to combine blues music and dance for students of both disciplines.

Here is his interview:

1. When did you decide to be an artist? And through what path?

I started studying piano at the age of 5, as suggested by my parents, but I was doing it with the wrong attitude so it didn't lead anywhere. When I was 12, after I watched the Blues Brothers movie, I decided by myself to learn how to play guitar and I found it very engaging, thanks to my great teacher Maurizio Ferretti and the charm of blues music itself, so mysterious, hypnotic and energetic. I started performing live after a couple of years of studying and straightway it seemed to me pretty natural and the audience's feedback gave me a big kick.

I think I've never actually "decided" to be an artist, but I can tell that step by step I keep on doing experiences which are leading me to the "artist condition"; I keep on digging deep into blues music and other styles, and through the years I played with many musicians and started collaborations with many different musicians including a true bluesman from New York called Guitar Crusher (50 years older than me), who recently passed away.

The other important fact is that in my town Pistoia, there is a 41 years old Blues Festival, and it gave me the opportunity to meet many blues heroes and see their shows since I was a kid, and the will to play on that big stage kept me working hard, so in the year 2000 I gave my first show there and a few more in the next years.

2. What difficulties have you encountered in your artistic career that you consider to be instructive at the same time and that have allowed you to take steps forward in your artistic career?

Since I often kept two or more jobs at the same time, I think one big difficulty I had was the lack of time, so the best results I had were in times when I was working 100% as a musician, and I could properly take care of the several different aspects concerning the artist's job.

The difficulty of promoting myself is still pretty strong.

3. What are the most important successes you have achieved on your path, how did you get there and how did they influence your story? Give practical examples

I would consider “successes” the experiences that moved me most, such as the first time I played abroad as a soloist, the time I saw a band of my students that I pushed onto the big stage at the Pistoia Blues Festival and the concerts I did with great artists such as Ben E. King, Eddie Floyd, the Miracles.

I specialised in different music styles, one of those is the Memphis Sound (Otis Redding, Booker T. & The M.G.'s, Sam & Dave, Eddie Floyd, Rufus Thomas, Isaac Hayes, Bar Keys), because of this reason I got hired as a guitar player for the band of Eddie Floyd. For sure it felt like heaven when I got the offer. I was so deeply involved into that particular style, that it brought me on stage with one of the greatest artists of the genre.

The longest and most formative collaboration I've had was the one with Guitar Crusher, a true bluesman from North Carolina, who passed away one year ago. We met at a jam session (a spontaneous collaborative music happening) in a club in Berlin in 2005, we really enjoyed playing together. For me it was actually like playing the proper way for the first time, and the same night we agreed on working together.

Through the following 15 years we kept on playing together, preparing shows, traveling Europe and we became very close friends. Just a few words about music, and a lot of stories from his incredible past.

Playing together with such music history witnesses gave me a big load of knowledge and emotions, as well as the feeling of being on the right path.

4. Knowledge exchange methodologies: How do you keep yourself updated? How do you share knowledge and skill updates with other artists/colleagues? Providing practical examples

For a guitarist and singer there are many aspects that require constant study and research: from the choice and care of the instruments, relaxation techniques, and of course study music and practice. This is why I participate in seminars and workshops, I go to concerts often with my colleagues, and I organize events myself in which to share experiences between musicians.

Due to the fact that I'm enjoying my job the most when I have the chance to meet people from all around the world, I've always been looking for sharing and cooperation.

Six years ago I started organising blues happenings for blues musicians and dancers, to bring to Italy the original meaning of the blues, which is to make people dance (Like

most of other popular music styles). These events are meant to put back the dancers next to the musicians and let them study and perform together, rediscovering the common language made of rhythm and movement, as a key element to make good blues music.

Students of both music and dance work together in classes, inputs about arrangements come from both sides, and this makes learning much more natural and very fruitful.

I am also working on an ambitious IT project for remote collaboration between musicians.

It can be resumed in three main points:

- ➔ A community of professionals (musicians, agents, clubs, festivals, teachers and music schools, but also related arts and techniques, such as dance, video making) that stimulate connections on a global level and the creation of new music and new bands and facilitate their activity.
- ➔ An e-learning platform (which can also be used as a supporting tool and archive for face-to-face lessons) with practical tools that facilitate the organisation of lessons and the use of interactive teaching material.
- ➔ The engine of the platform is an online multitrack recorder that can be used both synchronously and asynchronously, which therefore offers the possibility to more people, both close and faraway, to work on the same musical project.

There are already products on the market that offer a similar function, even financed by giants such as Microsoft or Spotify, but since they seem a bit user unfriendly and it's complicated to look for music and band members, I felt the need to build a new one able to express the true sense of sharing and collaborating.

5. What suggestions, advice, recommendations would you make to aspiring young artists?

I certainly need more suggestions than I could give, and since I don't know if I'm able to give any practical advice, but find a good agent and a good accountant, I'll leave you with just a little recommendation:

Share as much as you can, don't be jealous of your knowledge, and be always searching for new inputs and new experiences.

Travelling with colleagues, hosting them, being hosted, teaching, became (or at least they used to be before the pandemic) part of my lifestyle, that's how I kept growing musically and in general: sharing.

6 Conclusions

The aim of this chapter was to show how creativity and entrepreneurship go along, giving not only theoretical but also practical examples. We asked ourselves how we could describe the links between creativity and business. After consideration, we thought it best to directly ask people who actually turned their creativity into businesses, to describe their experience through short interviews. As the chapter shows, creativity is a fundamental piece in the business-building puzzle. Each interviewed artist gave their view on creativity and business. For example, Ada Montellatico in her interview says as a suggestion to anyone who wants to start an artistic business that *“the most important goal is to strive relentlessly for one’s own artistic identity, one’s own voice, one’s own sound. We are billions of people, we all have a face, two eyes, a nose, a mouth, but we are all different, so every voice is different and every expression must be different”* and that one of the difficulties that she encountered was the prejudice against women in the artistic field. Marco Magnani also says to *“always listen to one’s personal passions, one’s interiority, which represent our deepest and truest part. Forget about the trends of the moment, the fashions that the art world throws at you”*. As Valentina Bardazzi said *“the difficulty lies in finding the necessary time to freely experiment with one’s own ideas without letting them be polluted by marketability, which only distances the creation from its original value, to get lost in the myriads of copies according to the trend of the moment.”* Emiliano Degl’Innocenti suggests to *“share as much as you can, don’t be jealous of your knowledge, and be always searching for new inputs and new experiences.”*

In conclusion, in accordance with Ray and Meyers’ ten points presented in the introduction, for the interviewed artists the fundamentals of successful artistic businesses are: not giving up after failures, finding the time to actually listen to oneself, breaking down prejudices and criticism, being always on the lookout for new things to learn and discover. Every business comes from a creative idea, something new coming from someone who trusts their instincts and capability. This chapter wants to bring to light how important it might be to consider the creative impulse at the foundation of entrepreneurship, as it is an agent capable of intervening in problem solving effectively and it is also capable of giving flexibility and openness to the organisation which are necessary for achieving success.

We invite readers to consider the relationship between creativity and business development and to think about what questions might be asked of non-artist leaders of large companies about the impact of creativity on building steadfast and thriving businesses.

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Chapter 2.2

Creativity and critical thinking: Conceptions and dynamics

Abstract:

Global Organizations point to Creativity (C) and Critical Thinking (CT) as current crucial competencies that will be increasingly demanded in the 21st century, hence requiring a core shift in educational policy (Schleicher, 2018). Creativity appears as a multifaceted and complex phenomenon from which we try to give a broad grounded description. As to Critical Thinking, which is not unproblematic either, we describe briefly its emergence, drawing more in the contemporary refinement that settled in the ability to think rationally and reflexively to decide what to believe or do, by administering intellectual standards to the contents of thinking processes. Meanwhile, alternative conceptions have distanced themselves from such a rationalistic approach to fixed tasks and goals, namely by: starting to refer to methodological scepticism; activist engagement with knowledge; and the exercise of self-reflexivity. We finish with an attempt to show how the various understandings of C and CT could imply a dynamic of (inter)dependence complementarity.

Keywords:

Creativity, Critical Thinking, Complementarity, Interdependence, Dynamics.

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Chapter Structure:

1. The current importance of Creativity and Critical Thinking
2. Creativity characteristics, approaches and models
3. Critical Thinking definitions, characteristics and models
4. Creativity and Critical Thinking dynamics and complementarity
5. References

1 The current importance of Creativity and Critical Thinking

Creative persons have been recognised for developing novel, original and valuable outcomes for the profit of individuals or society, thus making the world move forward, rather than just daydreaming about it, as the solely imaginative person could fall into (Suciu, 2014). The creative person requires a sound basis of information and knowledge along with competencies (Christodoulou, 2014) that have been highly valued throughout a broad array of activities, namely the industry, business, education, research, science, and arts (Suciu, 2014). In particular, a relationship can be found between entrepreneurship and C (Kizkapan and Nacaroglu, 2021; Lubada et al., 2021; Jiang et al., 2020), as well as with CT (Budi and Farcis, 2021; Papageorgiou et al., 2021; Kırbaşlar & Özsoy-Güneş, 2015; Knoff and Timmons, 2015; Yaldiz and Bailey, 2019; Kalar, 2020).

Meanwhile, global organizations, like the United Nations Educational, Scientific and Cultural Organization – UNESCO (2016), conducted studies in several countries and have discovered that C and CT, along with problem-solving and decision-making are, currently and for the near future, crucial competencies, understood as intertwined. Schleicher (2018) emphasizes the importance of “applying knowledge creatively in novel situations” (p. 19). He points out that reflective practice is needed to take a critical stance when deciding, choosing and acting, while cognitive skills, such as “analytical or critical thinking are needed to foresee what may be needed in the future or how actions taken today might have consequences for the future” (Schleicher, 2018, p. 24). This means that “schooling today needs to be much more about ways of thinking (involving creativity, critical thinking, problem solving and judgement)” (Schleicher, 2018, p. 31). Moreover, the author comes to underline that C and CT skills are core to being successful in the 21st century, entailing a shift central to education policy required by the close ahead demands (Schleicher, 2018).

These ideas brought forth the centrality of C and CT as part of a set of combined competencies that configure the 21st-century required mentality, which researchers recognize apply to several realms (Sarwanto et al., 2021; Kanlı, 2020). Some authors refer to C and CT as soft skills conditional to influencing the development of many other skills, for instance, the dialogical ones, essential for areas such as professional jobs and particularly technical jobs (Livingstone, 2016). As Wechsler et al. (2018) notice, C and CT constitute problematic concepts that divide researchers about their eventual independence or complementarity, as well as for the roles these processes play in relation to each other.

Following the analysis of 42 definitions of the concept of C, Kamylyis and Valtanen (2010) point to its slippery and elusive nature, bringing forth the difficulty of producing

a definition that encompasses all the identified characteristics (Széll, 2021). Smith and Smith (2017) conclude that based on the various definitions, and instruments to assess it, C must be considered a problematic concept and multifaceted phenomenon (Kanlı, 2020). So, maybe we have to conclude that C exhibits all the characteristics of the so-called 'essentially contestable concepts' (Cabanas, 2002), which refer to these kinds of concepts that admit different meanings, giving way to contradictory solutions, for which possible consensus could only be provisory, with no definitive or decisive stance being allowed.

2 Creativity characteristics, approaches and models

Aside from the difficulty of defining C, we want to draw on the most inspiring and renowned approaches to establish a possible common ground of understanding. Plucker and Zabelina (2008) came up with the following definition: "Creativity is the interplay between the ability and process by which an individual or group produces an outcome or product that is both novel and useful as defined within some social context" (p. 6). The stance requires some analysis.

On one hand, it becomes manifest that, on a general level, C implies the reference to producing a novelty, i.e., something new, something that did not exist before. These creative new products are often described as "surprising or original" (Mishra & Henriksen, 2013, p. 11).

However, being a novelty may not *per se* transform a product into something that can be considered creative, as it should be related to having some utility. That is why, Crop-ley (2003, as cited in Mishra and Henriksen, 2013) mentions in his studies that "a novel idea, with no potential use, cannot be taken as 'creative'" (p. 11).

By analysing 42 definitions of the concept of C, Kampylis and Valtanen (2010, p. 198) found that most of the definitions were focused on four components:

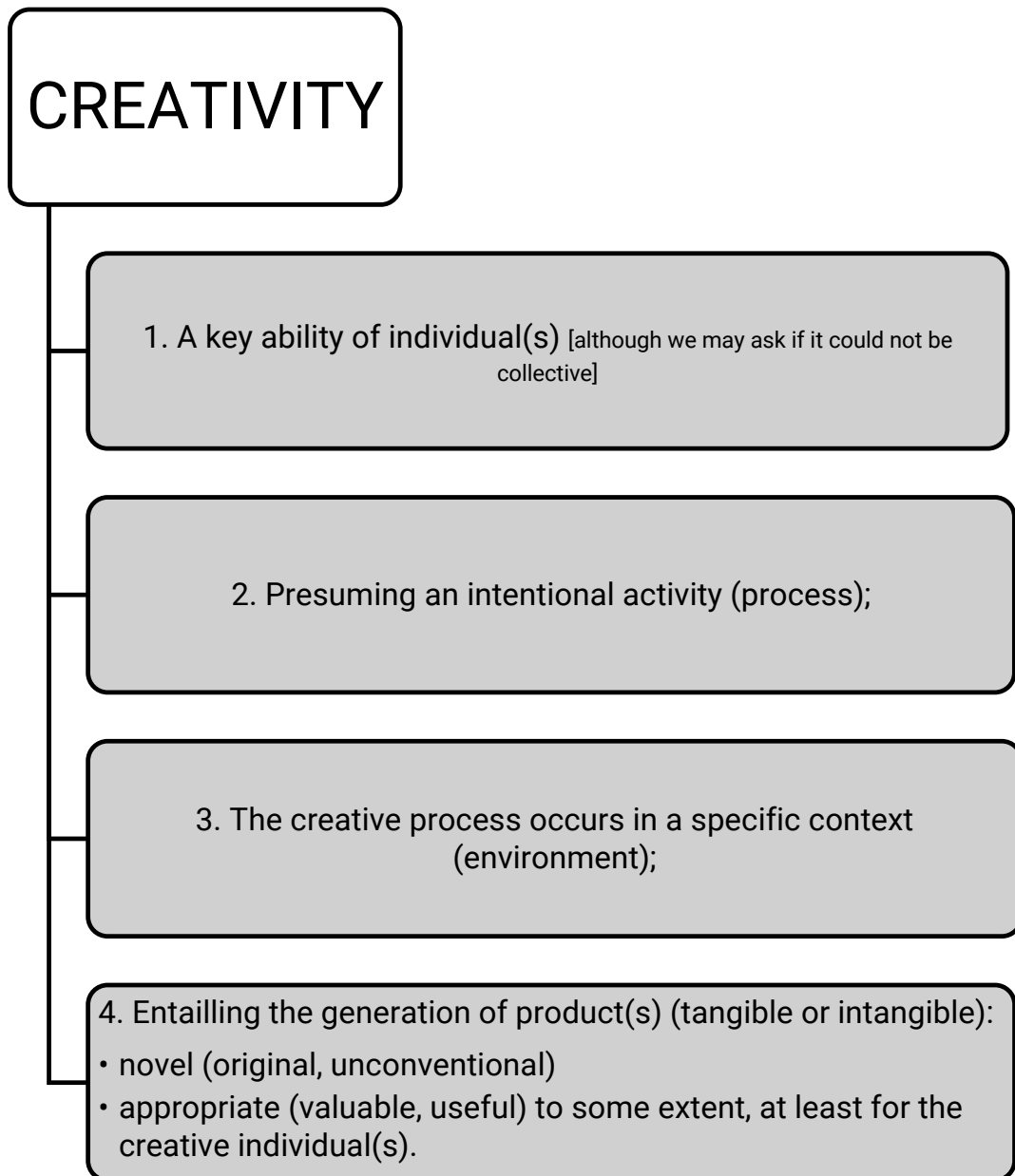


Figure 1. Components of Creativity

We can thus conclude that C usefulness is a very important characteristic, as it can refer to an ample array of appliances. It could encompass solving personal, organisational and social problems as well as, for instance, helping achieve sustainable development (Barbot *et al*, 2015; Lubart *et al*, 2013, as cited in Said-Metwaly *et al*, 2017).

Besides, as Mishra and Henriksen (2013) underline, a certain ‘wholeness’, referring to the aesthetic dimension of work –located in the specific context–, can be considered another dimension required to identify creative products, meaning that any new solution ought to be Novel, Effective, and Whole (Mishra and Henriksen, 2013, p. 13).

Pedagogical proposals:

Ask the students to identify components of creativity. In particular, allow them to give examples.

As was already suggested, there is a role to play in the context of C processes. **The Systems Model** describes C as resulting “from the interaction of a system composed of three elements: a culture that contains symbolic rules, a person who brings novelty into the symbolic domain, and a field of experts who recognize and validate the innovation” (Csikszentmihalyi, 1996, as cited in Colin, 2017, p. 27). Such theory deconstructs the myths related to creators and the world they live in, by showing the “interaction among domain, field and person” (p. 149). This means that creativity is “a systematic rather than an individual performance” (Mullen, 2019, p. 149), as it cannot be enacted without reference to the normative and social evaluation processes that belong to a specific domain, academic or professional.

According to Colin’s (2017) comprehensive study, the **Stage-based Model** considers C as a problem-solving process that can comprise **four phases**⁹¹:

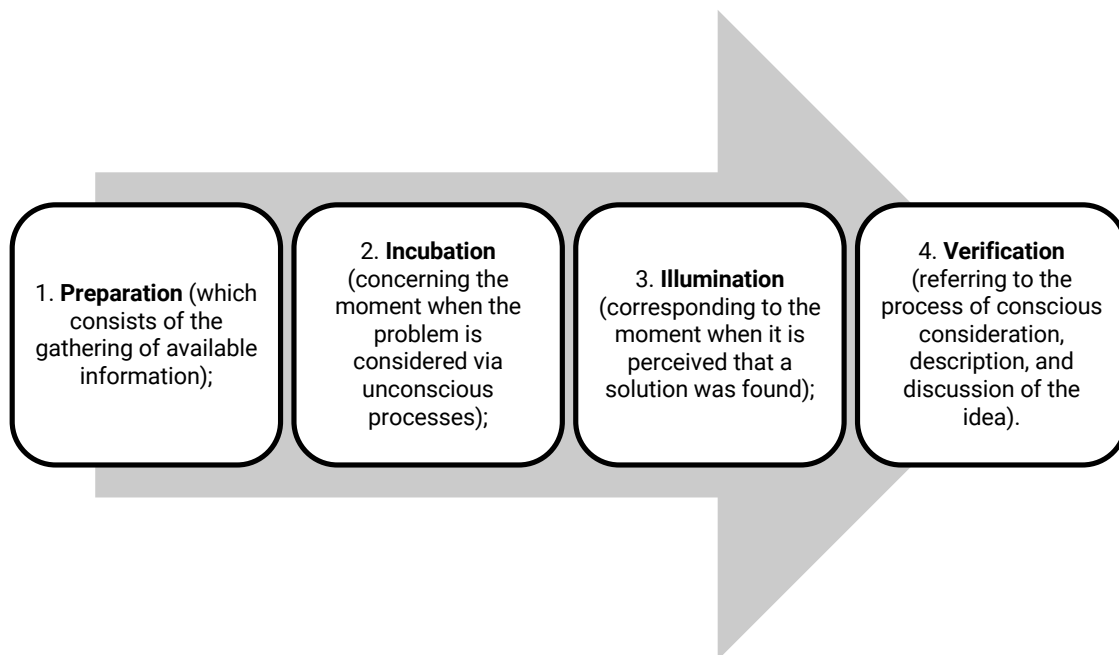


Figure 2. Stage-based Model four phases

9. It is patent that the author’s understanding aligns with rationalist/technicist model oriented to problem-solving, with fixed tasks and goals that we will discuss later regarding CT. Not far from this, we can find the Blind Variation, Selective Retention (BVSR) that focuses on producing solutions to a problem, which are subsequently evaluated by considering their usefulness/appropriateness or not for the problem. A such trial-and-error framework could be appropriate to cognitive/computational as well as social interpretations’ (Colin, 2017, p. 27).

Pedagogical proposals:

Ask the students to nominate the four phases of the stage-based creativity model. Let them probe how the phases flow for a given example.

Other authors have proposed models including more phases, such as problem discovery or communicating results. Lui (2021), for instance, adds: 5. Evaluation and 6. Elaboration. Some refer also to 'Exploration', 'Execution', or 'Presentation', at the end of the C process. Others go even further (AskMartin.ifo, 2021).

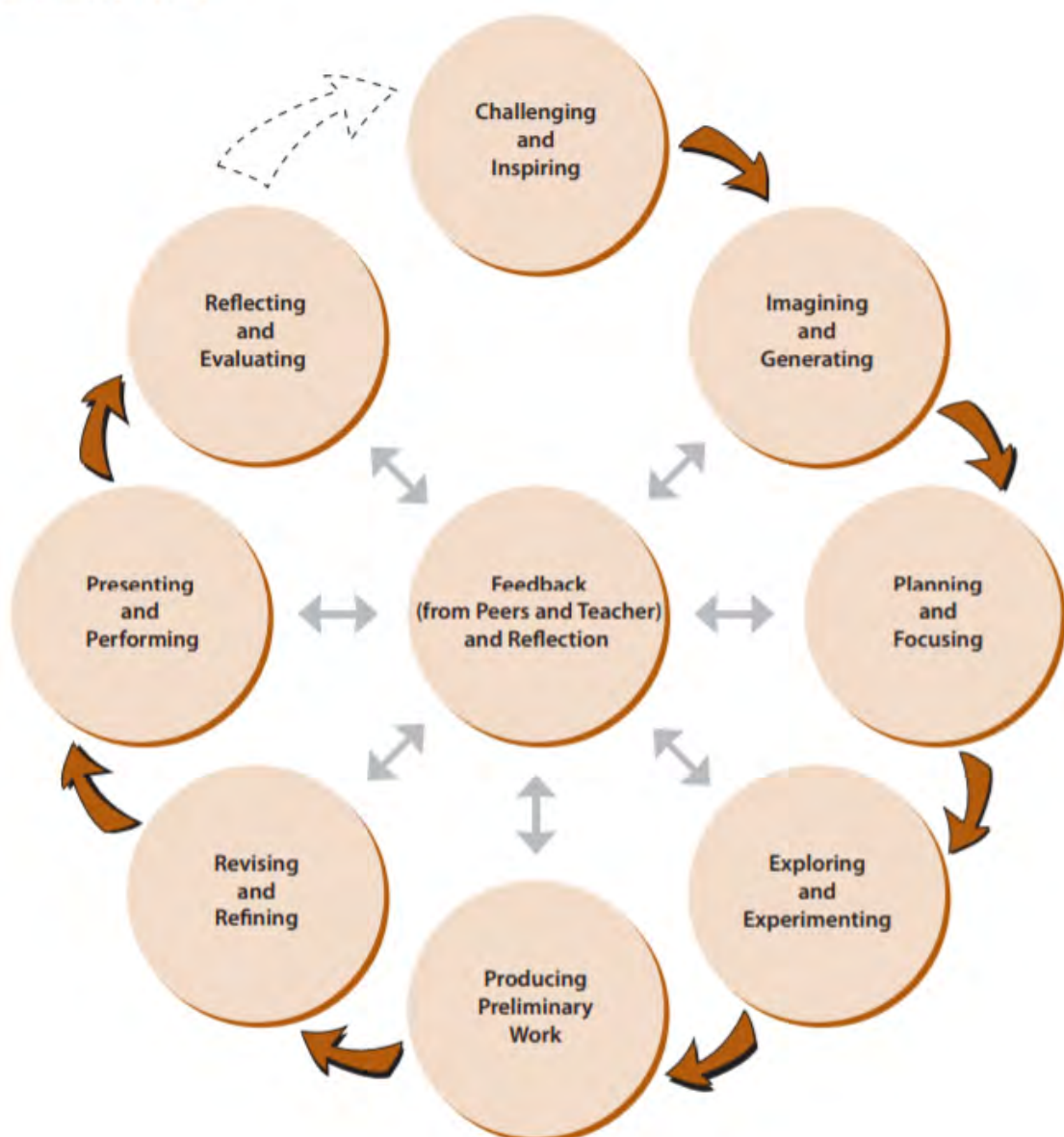
The Creative Process

Figure 3. The Creative Process

As to the **achievement level** of C, Kaufman and Beghetto (2009) proposed to differentiate, at least, three forms. Everyday creativity (Little-c), as a process of solving everyday problems, which do not change the world. 'Pro-C' refers to the high achievement of C, which is related to creative professionals, although not famous ones. In Pro-C creativity, creators use, replicate, improve, and reconstruct pre-existing products and begin the process of transferring them to a new starting point, remaking knowledge structures. Finally, 'Big-C' pertains to the creativity of famous and great relevant works, being considered the kind of C which is present in the ideas that have transformed societies and the world. Dewey (1934, as cited in Mullen, 2019) considers Big-C equivalent to "attain[ing] classic status, it somehow becomes isolated from the human conditions under which it was brought into being and from the human consequences it engenders in actual life-experience" (Mullen, 2019, p. 149).

Pedagogical proposals:

Ask students to give examples of Little-C, Pro-C and Big-C. Maybe you can give some examples and ask them to identify in which category they fall. Subsequently, you can give them a spreadsheet where they can fill cases searched from the web, which you can use as an assessment tool.

Identifying C characteristics helps to understand its nature and to recognize it. However, it doesn't indicate the kind of approach to the phenomenon or the type of instrument adequate for its assessment. In view of classifying the approaches, Rhodes (1961) analysed various aspects of C and proposed the '**4Ps model**', which distinguishes the process, product, person, and press (place). **The Process** approach is mostly related to the cognitive mechanisms that regulate the production of novelty (Cropley, 1999, cit. in Smith & Smith, 2017). **Product** perspective concerns the result, including the communication of the ideas, whether unique, new/novel and/or useful. **Person** technique refers to how each person develops C as a person having a certain characteristic (Runco, 2004, as cited in Smith and Smith, 2017). Finally, **the Press** point of view refers to the environment where creative ideas occur (Rhodes, 1961; Said-Metwaly et al, 2017).

Smith and Smith (2017) report that, over the last decades, the '4Ps model' was expanded to the '6Ps model', which emerged when **persuasion** and **potentiality** were added. The authors also give notice of an approach that focuses on **personal motivation, personal properties, and personal feelings**.

Such expansion of aspects could make C more difficult to conceptualise, while it also broadens the possibilities of approaches that can serve various purposes. In sum, when we look back at all the considered approaches and bear in mind the complexity and multidimensionality of C, we feel tempted to propose the integration, as far as possible, of all the above-mentioned insights.

Pedagogical proposals:

On the smartboard, use a Word or Excel double-entry table, and ask students to make alignment suggestions by putting models in columns and phases in rows. Alternatively, you could distribute the table on paper and ask them to fill it, in small working groups.

3 Critical Thinking definitions, characteristics and models

3.1. Origins and the mainstreaming conceptions of CT, emphasising objective fixed tasks to achieve fixed goals

Critical Thinking (CT) is not an unproblematic concept either (Niu et al, 2014; Puig et al, 2019). Although teachers broadly agree about its importance as an educational ideal, it does not imply the same perceived importance or relevance for everybody, nor do scholars agree about its conceptualisation. The analysis of CT was rarely conscious and explicit before the 90s, teachers and scholars continue to often adopt the idea based on the tacit belief it stood for as if it was drawn from given common comprehension, i.e., a self-evident foundation of Western thought, that they have learned intuitively (Moore, 2013).

The development of CT can be traced back to Ancient great Greek philosophers. Very remarkably are the Socratic maxims “Know thyself” (Plato, 1925, 48c) and that “the unexamined life is not worth living” (Plato, 1966, 38a, 5–6). These imply that a set of unexamined lives would produce a dangerous and unjust world. Such a scenario is relevant to human history up to the present.

Pedagogical proposals:

Suggest the students give reasons for following Socrates’ maxim “Know thyself”. Ask students for examples, of personal or collective nature, of actions and projects that went wrong for lack of an in-depth examination. Give them examples and let them discuss the cases and implications. Encourage them to look up other examples to be presented later or as homework.

Such reality seems to refer to a tendency of human thought, left to itself, to become prone to accept established beliefs without questioning, or to assume prejudices, drop down to hasty generalisation, be subdued to common fallacies, and self-deception (e.g., rationalisation and wishful thinking), as well as rigidity and narrowness of approach to subjects, situations, ideas, reasoning, beliefs, attitudes and behaviours (Critical Thinking Community, 2022a). This propensity to fail careful examination leads us to produce

errors, slide to misunderstandings and induce distortions. Hence, when we lack the prudence to reflect upon our thoughts we run a serious risk of condemning ourselves to an unexamined life.

Pedagogical proposals:

Give students examples of human atavistic cases of equivocation and deceit; you can use Cartoons (Appendix 1). Ask students if we can consider indefinite economic growth to be possible, as defended by many politicians. Bring to their consideration the case of economic development at the expense of mining that permanently destroys ecological niches and deforestation of the Amazon rainforest. Ask students if they are aware of any responsible person or institution that denies the effects of human activity on climate change, despite conclusive scientific reports pointing to imminent ecological catastrophes. Ask students if they heard someone sustaining that we had lower temperatures in a given Summer, failing to have a long-term insight on climate change. Suggest a debate on the assumption that science and technology will solve all ecological and social problems. Analyse with the students the case of the Report requested by President G. W. Bush to a notable scientist who later edited it to satisfy the interest of continuing pollution and exploitation of resources at the same pace. Ask also if they heard that "some people are poor because they are lazy".

Based on our literature review, we conclude that the most extensive and comprehensive study of CT was undertaken in 1990, by the American Philosophical Association (APA), which relied on a Delphi Technique applied to experts. APA (1990) came to state the following: "We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as an explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based" (p. 3).

This study by APA has established a dominant vocabulary expressing the association of critical thinking with skills as tasks performed in an objectively assessable manner. Such conception can be deemed as mechanistic critical thinking, which assumes objective rationality leading to firm beliefs in the light of evidence and argument, composing a formal and objectifying reason. It thus assumes an absolute critical distance from emotions, context, and prejudice, while accepting the proximity to universally valid criteria. Such an approach has been consolidated by The Critical Thinking Community (CTC) (2022a), and by authors such as Ennis (1987, 2001), Siegel (1988) and Facione (1990). It could be seen in the proposal of Demir et al. (2011), who recognize five steps of CT

unfolding: 1: Adopt the attitude of a critical thinker; 2: Recognize and avoid critical thinking hindrances; 3: Identify and characterize arguments; 4: Evaluate information sources; Step 5: Evaluate arguments.

The same understanding could be seen as assumed in the following encompassing definition:

Critical thinking is the intellectually disciplined process of actively and skilfully conceptualising, applying, analysing, synthesising, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness. (Sellars et al., 2018, p. 1)

Not far from such understanding, Hidayati et al. (2019) see CT as an ability to think rationally and reflectively, in order to decide on what to believe or do, by applying intellectual processes in conceptualizing, applying, analysing, synthesizing, and evaluating information, meaning high-level cognitive skills such as conceptualization, analysis, induction, deduction, evaluation, assumptions recognition, justification providing within an intellectually open attitude that leads to logical and appropriate actions.

The Critical Thinking Community (2022b) presents CT as an autonomous way of thinking –about any subject, content, or problem– in which the thinker improves the quality of his thinking by judiciously analysing, assessing, and, rebuilding the contents of thought. Moreover, CT is understood as being self-directed, self-disciplined, self-monitored, and self-correcting (Cf. APA, 1990). It also could be taken as a form of addressing ‘problem-solving’, as is the tendency among some of the more applied disciplines (Boud and Felitti, 1991; Hoey, 1983, 2001). Even when recognising limitations to CTC approach, several authors still adopt the basic ideas, as is the case of Enciso et al. (2017), Sarwanto et al. (2021), and Ennis (2016), just to mention a few.

Although sharing the above-mentioned generic paradigm, the model proposed by Paul and Elder (2010) presents a sophisticated algorithm of CT unfolding (Figure 4). The authors distinguish the elements implicit in all reasoning that should be an object of the CT process. Namely, purposes (as all reasoning must have one), problems (which all reasoning is trying to solve), assumptions (which all reasoning is based), viewpoints (underpinning all reasoning), information (on which reasoning relies), concepts (through which reasoning are expressed), inferences and interpretations (through which reasoning leads to conclusions), as well as to implications and consequences. It follows that some ‘Universal Intellectual Standards’ should be applied to the referred contents of thought: Clarity, Accuracy, Precision, Relevance, Depth, Breadth, Logic, Significance, and

Fairness; which are supposed to ensure sound reasoning, i.e., good critical thinking that requires having a command of these standards. Supposedly, the consistent application of the standards of thinking to the elements of thought would result in developing a set of intellectual traits: Intellectual Humility, Intellectual Autonomy, Intellectual Integrity, Intellectual Courage, Intellectual Perseverance, Confidence in Reason, Intellectual Empathy, and Fairmindedness. Reciprocally, these would feed a better proficiency on the appliance of the standards. If the standards get infused in all thinking, the thinker would develop better and better reasoning proficiency, along with the deepening of intellectual traits.

Paul-Elder-Critical Thinking Model

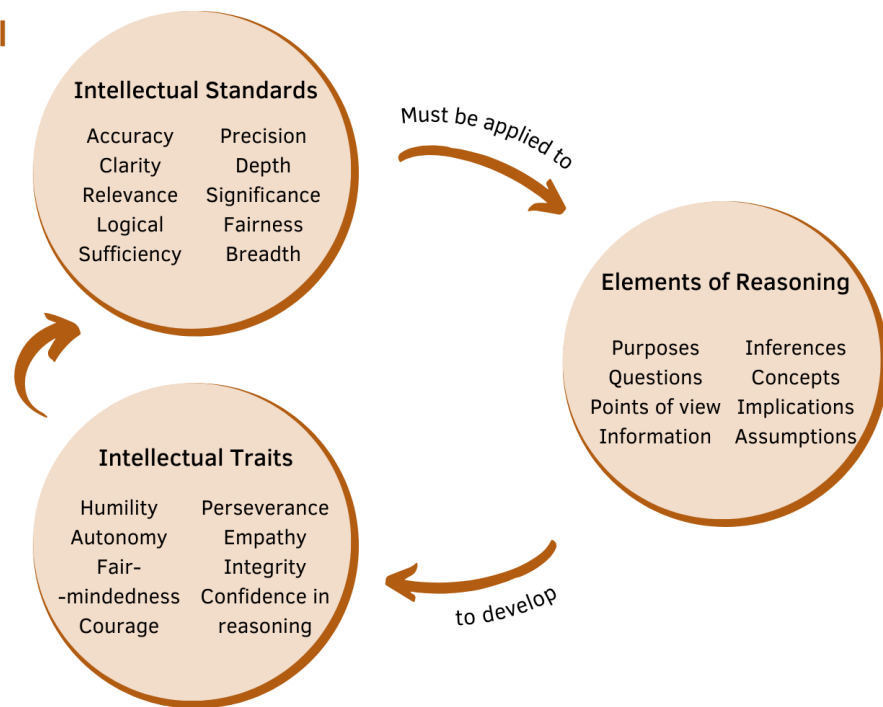


Figure 4. Adapted from Paul and Elder’s Critical Thinking Framework (Paul & Elder, 2010)

Pedagogical proposals:

Give students a “Critical screening matrix” (Cf. Table 1 in Appendix 2), filled or not with a given example, and ask them to apply it. Stage a debate for confronting results obtained by different groups of students.

We can find many things in common with Paul and Elder’s algorithm and Demir et al. (2011) understanding that CT: 1. is based on questioning, being necessary that the deductions made in the process of critical thinking depend on convenient, valid, and strong evidence; 2. requires profound thinking; 3. requires focusing. They also recognize in CT the following sub-dimensions: 1. Getting to know the problem; 2. Collecting and select-

ing suitable data for the solution of the problem; 3. Getting to know the structured and unstructured assumptions; 4. Selecting and formulating the assumptions that are related and leading to a conclusion; 5. Deducting the valid results and discussing the validity of the deductions; 6. Inductive judgment; 7. Deductive judgment; 8. Judging the reliability of the assertions; 9. Defining the assumptions at discussions. As to the tendencies of CT they refer to: 1. Analyticity; 2. Open-mindedness; 3. Curiosity; 4. Self-esteem; 5. Search for the truth; 6. Systematicity. As may be easy to devise, Paul and Elder's (2010) standards and even some traits of character can be found in this proposal.

3.2. Breakthrough conceptions of CT relating to a 'Communicative Reason', concerned with political, existential, and moral choices

Relying more upon intuition than in experimental research, it was suggested that critical thinking consists of a process of purposeful reflection requiring logic. Such a trend gave way to a conception of knowledge referring to a justified truth and oriented to effectiveness and performativity, reflecting a technicist ideal (Papastephanou and Angeli, 2007). That is why, since the beginning of the 20th century, education was assumed as a task of instilling "correct thinking Skills" (Demir et al., 2011, p. 545).

Nevertheless, as useful and popular that the rationalistic strand may be, it has encountered critics that brought forth alternative strands for understanding CT. For instance, Papastephanou and Angeli (2007) have investigated the breakthrough conceptions of critical thinking beyond the established educational framework that emphasizes fixed skills or tasks to achieve fixed goals. The authors diverge from the rationalistic conception that marks, in particular, the reference to performance and outcomes, which fails to consider non-purposeful kinds of rationality that are indispensable to critical thought. Namely, the authors point out a, let's say, 'aporetic attitude', or predisposition for question raising, that could better allow the deconstruction of the taken-for-granted assumptions, instead of focusing on problem-solving.

Papastephanou and Angeli (2007) refuse to enclose rationality within instrumental reason, leading to the production of 'prudentialized minds' and instrumental entrepreneurial selves. Which means developing 'effective thinking' rather than critical thinking. Now, if indeed the expertise of following fixed procedures to find the 'right' path or solving a problem could be somehow relevant, this would be true only, and only if, the thinker also may assess the applied criteria. Which is the line where the mechanistic vein can be opposed by communicative rationality – a higher-order rationality oriented to mutual understanding and guiding opinion, i.e., communicative rationality – along with the conception of knowledge as accumulated experience in a situation (Papastephanou and Angeli, 2007).

That is why, CT should be envisaged as opening the way to criticise tasks themselves, e.g., the commitment in itself with the fixed goals, its critical desirability in the scope of ethics and politics, not to mention environmental issues. So, opting for an existential point of view, thus being able to criticise the “taken for granted in a social context” (Papastephanou and Angeli, 2007, p. 612). Namely, the social standards, applied for evaluating means and ends, while setting commitments with values, for justifying actions. This claims for an education that involves empowering the questioning of what is under consideration, the very goals, including the criteria, not necessarily dismissively, along with unveiling the hidden aspects and reflectively and imaginatively foreseeing the alternatively new and unknown.

Now, goals are not simply to be achieved but also to be checked by introspection and regarding deliberation, meaningfulness, and moral pertinence. For our part, we recognize value in applying intellectual standards to the elements of reasoning, implying the development of some intellectual traits, congruent to judicious reasoning. Nevertheless, we also have to acknowledge that such an approach doesn't cover all the broadband of CT possible strands. We so do devise a complementarity between CT fixed tasks' approach and the concerns about political, existential, and moral choices, which appear as significantly important and critical.

Considering the limitation of the skills approach to CT, Dunne (2015, p. 93) has bridged it with criticality stating that it “internalizes all that is good about critical thinking (the search for truth, cogent reasons, inquisitiveness, prudence, willingness to reconsider, care [Sorge], creativity, imagination and so on), and integrates them into how we live our lives and approach the world.” This means that criticality entails engaging with the world. So, as a philosophical activity, criticality involves questioning educational problematics, like ‘What is education?’ and ‘What is education for?’, implying critical self-reflection paralleled with authenticity in action (Cf. Biesta, 2015).

Refusing the idea that CT corresponds to a simple cognitive and context-independent skill, based on deductive logic, Thompson (2004) proposes to approach CT, while being a pedagogical aim, through the Wittgensteinian concept of ‘language games’ and Theodor Ballauff's ‘re-evaluation of thinking’. The author stresses that many disputes transcend the faults of argumentation logic to be settled, requiring the consideration that the stances have different background assumptions, which subject-specific ways of truth validation, as well as forms of argumentation, derived from contexts, correspond to. This means rejecting there is a single form of rationality or argumentation that could apply universally to serve every subject matter or form of dialogue.

Therefore, contending reasonings cannot be reduced to formal logic without the hindrance of the contexts used to create meaning. Meaningfulness and truthfulness de-

pend on a specific theoretical horizon that settles a 'language game', i.e., specific language rules or norms that have to be acknowledged, to decide on the plausibility of a line of arguing. In addition, no language game would encompass all other language games; rather arguments relate to concrete contexts of specific discourse practices, shaped by historical, cultural, and epistemological dimensions. For Thompson (2004), thinking is given to us as a transcendental condition for the possibility of the world. Thinking is structured and limited by its horizons installing some 'prejudices', assumptions taken for granted, rooted in our cultural and historical situatedness, that enable and limit our rationality, all in all, much like in the case of 'language games'.

Pedagogical proposals:

Propose students a historical event case that raised conflictive appreciations, for instance, the U.S.A. war on Saddam Hussein's Iraq. Alternatively, propose they discuss the hanging of Saddam Hussein without trial, as it happened in Nuremberg for the Nazis, and distributing the image caught by a cell phone. Suggest they consider the motivations underlying Iraq War.

So, CT becomes a meta-process of unveiling our prejudices or assumptions and their function in configuring the meanings of our discourses, although we never get free of such blind pots –the historical situatedness– configuring our viewpoints. Hence CT turns out to be a never-ending process of underlying plausibilities that become questionable from the viewpoint of different underlying plausibilities, giving way to changes of perspective. Critique and argumentative plausibility are always dependent on context, which makes critical rationality a precarious pedagogical aim, while a limited and specific task. It should be left to the person to choose between a course of life independent of the moral code of society, or in accordance with it. This means that critique doesn't have to be negation and destruction of the traditional but it must stay open to that possibility and the risks it entails for society. Although we can afford only limited autonomy within the contexts we are unavoidably corseted in, critical evaluation of sceptical exercise about the settings excludes the solipsistic and individualistic conception, aside from the relational context always implied. While going beyond rejection and destruction and focusing on the discussion of unquestioned perspectives and open alternatives, so, embodying a double sense of emancipation and participation, as complementary sides of the critical endeavour (Thompson, 2004).

Contributing to the opening of the spectrum of CT conceptualization, Moore (2013) has gathered research evidence of seven definition strands:

Table 1. Moore’s breakthrough strand of CT

Strand designation	Description
(i) as judgement:	Making judgements, distinctions or taking a stance – raising the question of truthfulness (and value judgements that can taint as ideology), validity (good arguments and premises leading to conclusion), or at least acceptability and even persuasiveness;
(ii) as scepticism:	Entailing a propensity to negative appreciation or caution in accepting judgements and ideas, including a critical view towards their own ideas, beliefs and assumptions – and those backed up by charisma or being accepted without question, the ‘naturalized’, common sense or ‘taken-for granted’;
(iii) as simple originality:	Meaning not just appreciating but to take the effort of producing novel ideas, coming to conclusions, ‘making a case’, drawing connections or ‘taking things outside the accepted’, i.e., lateral or divergent thinking;
(iv) as sensitive readings:	Going beyond a text’s literal meanings, engaging with its broader rhetorical framework, and unveiling the underlying motives, intentions and agendas, alongside the historical context, which could mean grasping the broader paradigms of writing and thinking that existed at the time of its production, which could require a non-judgmental or empathic approach;
(v) as rationality:	It means seeing rationality as a universal method, i.e., a reason-based approach to thinking, looking for the best reasons, demonstrating and referring to the principles of reason and logic;
(vi) as an activist engagement with knowledge:	Thus, going beyond acts of cognition and incorporating critical action, which could mean a socially engaged critique and taking stances of subversion, compromising with emancipation and pushing a particular moral;
(vii) as self-reflexivity	In this last case, it means not just focusing on “the form of knowledge as such, but rather turning back at the originator of these thoughts – the thinking self” (Moore, 2013, p. 518). Self-consciousness, or self-reflectiveness could mean focusing on how self-judgements are made, gaining the clairvoyance that our notions and judgments are always shaped by the self-perceptual and conceptual apparatus; which makes one’s accepting the impossibility of entirely objective knowledge, as well as an entirely objective critique, and rather accepting the irredeemable contingency and indeterminacy of rationality

The broad mode or multidimensionality identified in critical thinking precludes the tendency of considering it as a univocal rationality procedure. In the line of Moore (2013) and Thompson (2004), we conclude with Papastephanou and Angeli (2007) that the rationalistic set of aligned skills conception, as important as it may be, becomes a narrow insight that can focus on criticising the means for achieving a goal but not the goal in itself. It also implies relying upon a thoughtful application of criteria that can miss the critique of the system of criteria and their frameworks, i.e., lacking commitment that can slipstream to trivialization and domestication.

4 Creativity and Critical Thinking dynamics and complementarity

The above-held discussion has defied the reduction of Critical Thinking and Creativity to a narrow and readily identifiable cognitive mode, thus giving way to a multidimensional view due to their unavoidable complexity. That is why we have deemed C and CT as 'essentially contestable concepts' (Cabanas, 2002).

The complex nature of Creativity and Critical Thinking is well expressed by the dissent about the processes they sought to imply, along with the acknowledgment of their integration, without completely excluding their independence, and in the questioning of the roles that C and CT may play in the different phases of both processes (Wechsler et al., 2018). Whatever the case, the above-undertaken discussion has led us to discern the dynamics that C and CT may maintain, as a form of interdependence complementarity that could, possibly, be recognised in their functioning. As a basis for the approach, it is convenient to highlight Lipman's (2003) postulate that thinking is intrinsically a critical and creative process, through which phases the thinker may tend to generate creative solutions, that could fuel CT, while in other phases critical thinking may be of an utmost requirement for evaluating and taking decisions regarding courses of action. Besides, it is worth recalling that, not only academic performance, but most professions entail problem-solving situations, that claim for creativity and critical thinking, although being very unlikely that such competencies could intervene separately, which does not authorize us to say that they are not relatively independent constructs (Wechsler et al., 2018).

While Demir et al. (2011) stress the importance of Lipman's suggestion of three types of thinking, namely Critical, Creative, and Caring Thinking, to which they add the fourth kind of 'Hopeful Thinking'. The authors, then, consider the four types within two crossed dimensions: the cognitive-affective and the convergent-divergent. Consequently, they come to state that while CT and C are mainly cognitive¹⁰, Caring Thinking and Hopeful

10. Something with which Wechsler et al. (2018) disagree, as they see both C and CT as involve motivation and attitudinal dispositions.

Thinking are mainly affective thinking ways (Figure 3). CT and Caring Thinking are seen as abiding rules, being mainly convergent thinking ways; while, creative thinking and Hopeful Thinking present an elastic rule structure, corresponding to divergent thinking ways.

Table 2. The Quadruple thinking model

	<i>Convergent</i>	<i>Divergent</i>
<i>Cognitive</i>	Critical thinking	Creative thinking
<i>Affective</i>	Caring thinking	Hopeful thinking

Following such line of thinking, we should not fail to notice that while considering Creativity a dimension of the intellect, it could be seen as resulting from the interaction between convergent and divergent productive processes. On one hand, we can envisage a relation between convergent thinking as corresponding to the type of thinking that links one solution to a problem –as in the fixed tasks and goals model above discussed; on the other hand, we can envision divergent thinking as referring to many possible ideas and solutions, thus being also considered to be responsible for C (Széll, 2021). In this last case, we may understand the intervention of CT within the ‘aporetic’ and ‘language games’ approaches above discussed.

A similar twofold framework to envisage the relations between C and CT –through the divergent-convergent thinking model– can be found, in the already mentioned, creativity Four P’s approach. The **“Process Approach”** involve “cognitive factors that lead to creative production like the finding and solving problems, selective encoding (i.e. selecting info that is relevant to the problem and ignoring distractions), evaluation of ideas, associative thinking, flexibility, and divergent thinking” (Kanlı, 2020, p. 4) – would, much obviously, fall into the CT divergent mode, requiring its intervention. On the side of the **“Person Approach”** the strategy is to focus on the personality or traits associated with a typically creative person, namely “autonomous, self-confident, open to new experiences, independent and original” (Kanlı, 2020, p. 10), could also be seen as claiming for the divergent CT mode. The **“Product Approach”**, as figuring creativity by rating the specific characteristics of products, within an established horizon of parameters, seems more likely to represent an appeal to the convergent strand of CT. As to the **“Press Approach”**, concerning the “contextualist” insight, i.e., time and place, people, culture, and political climate, as well as the resources available, among other factors, we envisage a more likely alignment with divergent CT mode. However, if we combine the “Product” and “Press” approaches we can raise the question about the social relevance of a creative

product to a historical context and/or a specific culture that may either require convergent (when considering parameters) as divergent critical thinking (when going further than the established criteria).

Moreover, Demir et al. (2011) propose that C and CT could form a cycle. For instance, CT could appear in the inquiring phase that opens the creative process and at the end when it becomes pertinent to assess it, regarding its quality and usefulness. For its part, Caring Thinking could intervene as a meta-criteria guiding critical thinking, by taking its sources from evaluational, emphatic, and normative thinking. On the other hand, Hopeful Thinking could contribute to CT in the process of improving its criteria, as it requires that the thinker has some hope or hopeful thinking about a subject. Complementary, CT may contribute to HT in the determination of what objectives are in possible dimension and which are in probable dimension, in the stage of determining objectives and guidance for hopeful thinking.

Such an approach is also clear in the case of, the already mentioned study, by Wechsler et al. (2018), which recognises C as the production of useful novelty under the appliance of four Divergent Thinking dimensions (fluency, flexibility, originality, and elaboration), intertwined with the understanding of CT as the appliance of five dimensions (deductive reasoning, inductive reasoning, practical reasoning, decision making, and problem-solving). The authors find a relative differentiation and independence of creativity and critical thinking in cognitive performance, even if both constructs play small but complementary roles in different phases of creative problem-solving. Namely, flexibility, as the ability to consider the same information from different points of view, appears to enhance critical thinking skills. While, critical thinking, being associated with a kind of thinking that is less dogmatic and more relativistic, indicates the need for flexible thinking. On one hand, we may point out that an intellectual critical function as inductive reasoning, being an ability to figure relationships, identify regularities and principles, or make inferences, through analogies and metaphors, could be very helpful to creative thinking; while, on the other hand, we could also see it in reverse, as it could be the fluency and originality of creativity favouring inductive reasoning (Wechsler et al., 2018).

Drawing on our previous analysis of CT, further forms of interdependence dynamics of complementarity can be envisaged. For instance, when we consider C as a systematic interaction within a culture (between a novelty brought into its symbolic domain and the experts supposed to validate it), we can conceive a relation with CT 'aporetic attitude', or predisposition for question-raising. In this case, it could better allow the deconstruction of the taken-for-granted assumptions, so going further than what the experts' horizon would allow. Such endeavour would imply a kind of second-order creativity, precisely bursting from the horizons of questioning that could lay bare the fact that meaningful-

ness and truthfulness as well as creativity depend on a specific theoretical framework that settles a 'language game'. This would entail problematizing how the novelty really marks a breakthrough, by criticising the 'taken for granted in a social context', so taking stances with rooted cultural and historical situatedness. The process may even expand by profiling how far a creative work goes, considering the levels of replication, redefinition, reconstruction, and reinitiation, but also how it falls into Pro-C and Big-C.

On another hand, as, for instance, Art plays a role in society, we would expect that CT may be of help in chiselling the motives chosen for engagement with reality. As works of art are not neutral, as are not the innovations in industry or business, CT may be also called to consider the implications and consequences of C. Furthermore, as innovation may imply risk-taking, it can be, opportunely and usefully, an object of CT analysis, which is an evident case of how C and CT share openness as they share flexibility and synthesis, as these are required by the acceptance of uncertainty and the need of "gather loose dots" for composing something novel. Which gives a good suggestion of how C and CT may communicate through such homonym endeavours.

Discovering the interrelations between C and CT could be just a case of opening new perspectives and putting more effort into reflection or of breakthrough endeavours. We hope to have contributed to the broadening of C and CT understanding, along with the clarification of the possible lines of their complementarity, or interdependence dynamics which could be useful theoretically, methodologically, and educationally.

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Appendix 1



Appendix 2

Table 1. Critical screening matrix

GIVEN EXAMPLE	DEBATE & DECIDE	CHECK	
	purpose	ACCURACY	
	question	CLARITY	
	viewpoint	RELEVANCE LOGICAL SUFFICIENCY	
	information	PRECISION	
	inference	DEPTH	
	concept	SIGNIFICANCE	
	Implication	FAIRNESS	
	assumption	BREADTH	

Chapter 2.3

Fostering Creativity in Students: Tools and Methods for Teachers

Abstract:

This work delves into the crucial role of creativity in students' personality and the significance of nurturing their creative potential in the educational process. Our chapter presents a comprehensive set of exercises that teachers can use to enhance their students' creative abilities, including brainstorming groups, the 6-3-5 method, panel discussions, the Phillips 6-6 method, and a creative problem-solving approach. We emphasize the importance of creative teachers in the process of fostering creativity in students and highlight the essential conditions required for students to achieve a state of mind conducive to creativity. This guide aims to provide educators with practical techniques for cultivating creativity in pupils and students at any level. By implementing these tools and methods, teachers can empower their students to unleash their full creative potential and develop skills that will benefit them throughout their lives.

Keywords:

Creativity, development, methods, pupils, students, teachers, educators.

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Chapter Structure:

1. Introduction
 - 1.1. Preliminary thoughts on creativity
 - 1.1.1. Creativity as a dimension of students' personality
 - 1.1.2. Developing students' creativity - the purpose of the educational process
 - 1.2. Methods of cultivating students' creativity
 - 1.2.1. The brainstorming group
 - 1.2.2. The 6-3-5 method
 - 1.2.3. The panel discussion
 - 1.2.4. The Philips 6-6 method
 - 1.2.5. The creative problem-solving method
 - 1.3. Creative teachers – creative students
2. Conclusions
3. References

1 Introduction

Contemporary society is characterized by a series of fast-paced changes that radically manifest themselves, thereby reshaping behavioural patterns at work, in the family, in the education system, in science and technology, and in almost every other aspect of our lives.

At the same time, fear of uncertainty looms over the personal lives of individuals, within their families and inside society as a whole. To exemplify the latter: we are now, maybe for the first time in a long while, uncertain about the survival of the human species in the absence of generalized armed conflict. Living in such a world requires a high degree of adaptability and courage - traits that can be linked to creativity. Additionally, and given the increased dominance of consumerism, individuals of today need to fight an inner emptiness that correlates to outer apathy or superficiality, and the potential to understand reality and behave accordingly.

In this context, creativity plays an invaluable role. It's not merely about accepting and assimilating new ideas or processes, but being the originator of those novelties. As Rogers (1961) postulated, natural creative adaptation is perhaps the only way individuals can stay abreast of the rapidly transforming landscapes of their worlds. With the current rate of scientific, technological, and cultural progress, those who lack creativity and exposure to diverse ideas may find it increasingly difficult to confront the challenges thrown their way. This linkage between creativity and adaptability underlines the pressing need to foster creativity as a survival tool in today's world.

Although creativity is a social need, even in scientifically and technically advanced societies, many criticisms of culture¹¹ and education can be brought. Rogers (1961) presents the following criticisms: (1) education tends towards the formation of conformist people, with numerous and striking stereotypes, considering that it is preferable to ensure an education that is as comprehensive as possible, rather than to develop original and creative thinking; (2) in the industrial sector, creativity is reserved for a few categories of staff - the manager, the head of the research and development department, etc. - while most people are frustrated by originality and creative efforts; (3) in some cultures, creativity might not be well seen inside the social groups we are a part of; thus, one can observe tendencies towards conformity in consumption habits - be them related to culinary preferences, fashion, reading, music or ideology.

11. The term refers to the shared beliefs, values, customs, practices, and behaviors of a particular society or social group. It encompasses the collective knowledge, attitudes, and behaviors that are transmitted and learned within a community or society, influencing the way individuals think, act, and interact with others

1.1. Preliminary thoughts about creativity

1.1.1. Creativity as a dimension of students' personality and behaviour

The term creativity originates from the Latin word *creare*, which means to conceive, to give birth (Sternberg, 2005). To create means: to make something exist, to bring to life, to cause, to generate, to produce, to be the first to interpret the role and give life to a character, to compose quickly, etc. A creative person is one characterized by originality and expressiveness; they are imaginative, generative, pioneering, investing, innovative, etc.

Despite the large body of research devoted to *creativity*, we cannot yet speak of a consensus when it comes to defining the term. We've selected some definitions from a plethora of possible iterations offered by academic literature:

- "Creativity is not a synonym for talent" (Edwards, 2009, p.9)
- "Creativity is typically defined as the ability to generate novel associations that are adaptive in some way" (Ward, Thompson-Lake, Ely, & Kaminski, 2008, p.127).
- "Creativity is defined as the production of novel and appropriate ideas" (Amabile, & Conti, 1997, abstract).
- "Creativity may be defined as the capacity to transform experience into original and meaningful interpretations" (Runco, & Cayirdag, 2012, p 96)

By examining the above definitions and others scattered through scholarly works, we are drawn to the conclusion that novelty, originality, ingenuity and theoretical or practical value represent essential features of creative activity and behaviour. The lack of consensus in the approach to creativity may also stem from the fact that, for a long time, it was considered the prerogative of a minority of geniuses (Morriss-Kay, 2010), and, as such, research was oriented exclusively towards studying the life and activity of said highly creative people.

Taylor (1959) distinguishes between five levels of creativity:

- a) *expressive creativity*, the fundamental form of creativity, which is not conditioned by any aptitude and is the easiest to capture in children's drawings; the main characteristics of this level of creativity are spontaneity and freedom of expression;
- b) *productive creativity*, the level specific to technicians, because it implies the acquisition of skills that allow improving the ways of expressing creation;
- c) *inventive creativity*, that which is capitalized through inventions and discoveries and which highlights the ability to perceive new and unusual relationships, and new ways of interpreting known realities;

- d) *innovative creativity*, which requires a deep understanding of the fundamental principles of a field (art, science) and then the decisive modification in approaching a certain phenomenon;
- e) *emerging creativity*, the supreme level of creativity, which very few individuals reach, for it involves the discovery of a principle or an idea that will revolutionize an entire field of knowledge.

Fustier et al. (1988), drawing from the above work, show that in the mind of the masses, creativity is linked to artistic expressions and creations, technological inventions or scientific discoveries, interpersonal communication, education, personal behaviours and social movements. Creativity signifies adaptation, imagination, construction, originality, evolution, inner freedom, literary talent, and distancing from already existing things. Being creative means seeing the same thing as everyone else, but thinking about it or perceiving it differently. Popescu-Neveanu (1978) published a conceptual model that integrates three perspectives for the identification and analysis of creativity and which later became the frame of reference for several pieces of research: the creative process; the creative person (personality); the product of creation (creative performance).

1.1.2. Developing students' creativity - a purpose of the educational process

Today, scholars (Bonetto et al., 2021; Stetsenko, 2018; Wilson, 2010) unanimously admit that the phenomenon of creativity is not the exclusive prerogative of a minority. It is a general human characteristic, given that each individual possesses qualities that allow him to perform creative acts, although at different levels of achievement.

In this context, core to education (Marinescu, 2009) is the development and structuring of the creative forces inherent to each individual, so that individual activity naturally becomes a creative activity. The fundamental challenge for teachers is to identify what can be done to stimulate students' creativity? (Stoica-Constantin, 2004). There will never be a creativity guide so comprehensive and well-structured that we can open a certain chapter to know what we have to do or think about during the next stage of a creative process in any situation. There are, however, certain methods and guiding principles of a general nature, which can be applied to many or, perhaps, most problems related to creativity. Teachers can do a lot to stimulate students' creativity. Stoica-Constantin (2004), Sălăvăstru (2004) and Gruber et al. (2005) show that the teacher's positive attitude towards creativity is one of the most important factors that facilitate creative manifestations.

The first condition for the development of the student's creativity is for the teacher to know what it means to be creative, to have basic knowledge about creativity, the psychology of creativity, and the possibilities of its development in the educational process

(Stoica-Constantin, 2004). Thus, teachers will not be able to encourage something they do not understand or about which they do not know much (Roco, 2004). Here, it is also mandatory to respect students' creative personalities. This does not come easily if we take into account that creative students can ask uncomfortable questions and offer novel solutions to solve problems (Marinescu, 2009) while disregarding stereotyped procedures and being sometimes disturbingly curious and nonconformist.

Unfortunately, at times, the educational system not only does not encourage but inhibits the creativity of students, by cultivating conformist behaviours. Torrance (1962) found that creative students are constrained by conformity and that they are often faced with difficult alternatives: to sacrifice their originality and be accepted in the social group or to manifest their originality and risk rejection therein. Torrance's findings remain valid even today.

Teachers tend to appreciate disciplined students more. Those who complete their task without commenting and are willing to accept the reasoning of the teacher, or that of the majority of their peers, are more likely to win a teacher's favour. A student who is willing to disagree with the majority may arouse negative feelings, even if the former's opinion is valid. This tension has only been exacerbated in the age of social media and digital connectivity that typifies Gen Z's life experience. Despite living in an era marked by rapid change and constant innovation, we consider that many educational institutions still value and reward traditional student behaviours. Teachers may prefer students who conform to established norms - those who complete assignments without questioning, accept the teacher's reasoning, or go along with the majority viewpoint. Such an environment can stifle a student's willingness to express unique or differing ideas, even if those ideas are sound and valuable. Gen Z students, who are known for their independence, entrepreneurial spirit, and drive for social justice, are likely to chafe under such conditions. These students, more than any previous generation, have grown up in a world where their voices can be amplified through digital channels, and they expect to be heard and respected. For them, having the courage to disagree and the ability to articulate their reasoning is a matter of personal identity and integrity.

It is our firm belief that if the education system wants to truly serve and empower these students, it must shift towards a model that values and encourages diverse perspectives and creativity. It must embrace the fact that, in the age of information and digital technology, innovation and original thinking are more critical than ever. It must also acknowledge that fostering a culture of conformity is not only detrimental to the individual student's development but also potentially damaging to our collective ability to face the challenges of the future.

Even current students feel that teachers value conformity; subsequently, they comply with these teachers' expectations in order to have an "easy life" at school.

Many pedagogues and psychologists claim that the essential factor for stimulating the student's creative spirit is the dynamic of the teacher-student relationship, and the teacher's attitude in the classroom and outside the classroom (Gruber et al., 2005).

Equally, the teacher must learn to be creative in the way they approach teaching. If teachers do not demonstrate creativity in their teaching methods, it will be very difficult for them to develop the said skill in students. In the teaching-learning activity, the creative teacher uses strategies aimed at cultivating intellectual flexibility. The student is asked to approach a problem from different angles, interpret it, develop explanatory hypotheses, and independently search for solutions (Roco, 2004). While this path to learning is surely not the only one, encouraging students to ask questions is an essential aspect of developing creativity.

Students can be taught how to formulate a question, how to "play" with it, how to rephrase it, and how to assume the role of an investigator (Stoica-Constantin, 2004). Unfortunately, many of the discussions in class are guided by the teacher, who prioritizes ideas and questions that support their own arguments and ignores or rejects those that contradict them. This is a normal human trait that manifests throughout society, and suppressing it is very difficult in any field. By guiding students' activities, the teacher encourages them to discover knowledge and solve problems, but also to formulate problems.

Problem-based learning and (directed) discovery learning are forms of heuristic learning through which the teacher stimulates student creativity. However, given time constraints, the teacher might show students how to solve proposed problems. Thus, students can be "robbed" of the opportunity of finding original solutions themselves.

As an alternative, students can be guided to acquire independent thinking skills, show tolerance for new ideas, act freely and use constructive criticism (Gruber et al., 2005). This type of learning not only leads to the formation of a creative style of problem-solving but also has positive effects on the development of a student's personality. The student gets used to fearlessly approaching, analysing and solving problems. Students are stimulated to become brave and open, to find pleasure in fulfilling tasks.

If the goal of stimulating students' creativity is pursued, the teacher ought to pay more attention about how assessments are carried out. It is necessary to shift the focus of learning objectives and intended learning outcomes from knowledge-based objectives (checking the volume of knowledge, skills and abilities acquired by the student) to understanding- and skills-related objectives (evaluating the student's functional skills,

i.e. critical, independent thinking and originality, applying knowledge and skills in new contexts, solving theoretical and practical problems, processing and contextual use of complex information) (Stoica-Constantin, 2004). In this way, grading will no longer have a “coercive” and “punitive character” in the eyes of students (Marinescu, 2009). The tension and frustration that usually accompany the evaluative act can be harmful to the expression of students’ creativity (idem).

We argue that each evaluation process should be oriented in the direction of highlighting the positive aspects and the progress made by individual students. Getting rid of potential fear of evaluation can also be achieved by postponing the evaluation (as happens in brainstorming) or by establishing non-evaluation periods. The purpose of these latter approaches is to create the conditions for: each student’s free expression; the development of the ability to approach and solve problems creatively, without the fear of being sanctioned for possible mistakes; the increase of confidence in one’s own strength; and the development of the courage to take risks. The complete trust and appreciation that students feel from the teacher enable the former to overcome their shyness and inhibitions. As such, students end up considering themselves worthy of revealing themselves (Sălăvăstru, 2004). Summarising how students’ creativity can be destroyed, Amabile (1997, pp. 104-115) identifies four factors, which the author calls “creativity killers”, namely: assessment, reward, competition and restriction of choice. We’ve chosen to briefly tackle them.

The expectation of assessment can undermine a student’s creativity because they will focus more on how their work will be appreciated instead of giving free rein to imagination and fantasy (Sălăvăstru, 2004). As far as rewards are concerned, they cause the suppression of intrinsic motivation and personal drive, thereby ultimately leading to the reduction of creativity (Roco, 2004).

The third factor, competition, is more complex than reward and evaluation taken separately because it embeds both. Competition occurs when people know that their performance will be evaluated against the performance of others and that the best will receive a reward (Fustier, 1988). In these situations, students will end up worrying excessively about developing real strategies to top others, which can harm their creativity.

Finally, limiting students’ options or dictating the “correct” way to complete tasks can significantly inhibit creativity. When students lack the autonomy to explore different approaches or generate their own ideas, their creative potential is stifled. A prescriptive, one-size-fits-all approach to education tends to diminish the diversity of creative expression.

The influence of parental expectations and their active engagement also significantly impacts how creativity is addressed within the educational system. Some educators

report feeling compelled to cater to parental preferences in their teaching methodologies, even when such methods starkly contrast the educational needs of students (Marinescu, 2009). There are numerous instances where parents scrutinize their children's notebooks, expressing dissatisfaction unless they observe extensive exercises and texts (Lightfoot, 2004).

This scenario underscores the importance of open communication between educators and parents. It is crucial for parents to understand the educational objectives and pedagogical methods employed in the classroom. Fundamentally, this approach implies a shift in the instructional process, signifying a considerable change in style. Teaching that prioritizes creativity necessitates specific conditions to thrive. The most crucial factor is fostering an environment that motivates students to operate and think independently, initiate their own projects, and move away from the perception that all school activities must be rigorously directed and supervised by the teacher (Marinescu, 2009). Such an approach seeks to empower students' creative potential while considering their holistic educational needs.

1.2. Methods of cultivating students' creativity

The concern for the development of the creative spirit also led to the development of specific methods and procedures to stimulate creativity. The most well-known methods are brainstorming, the 6-3-5 method, the Phillips 6-6 method, and the panel discussion. These methods are especially effective in group conditions. In addition to all the aforementioned, group-based methods, more recently, creative problem-solving was added.

1.2.1. *The brainstorming group*

Brainstorming is one of the most famous group methods used for producing creative ideas. The essence of this method consists in separating the moment of issuing ideas from the moment of their evaluation. This method is used more frequently to find special ideas in the advertising, commercial, or technical fields. It can also be used in school.

The brainstorming group consists of 5-12 people, with the following structure: a leader (animator), a secretary and members. When forming the group, several requirements must be respected: the voluntary participation of members, amicable relations between the participants and the prohibition of a boss and a subordinate to be part of the same group.

Brainstorming takes place in three stages according to Stoica-Constantin (2004):

- In the first stage, the problem is identified and formulated. Then, the facilitator

invites the participants, at least two days before the meeting, informing them of the date, place and topic of the debate.

- The second stage is the actual brainstorming session. The leader states the problem up for discussion and the four rules of brainstorming (which will be recorded on a board, somewhere visible): a) Critical judgment is prohibited; b) Give free rein to your imagination (even by providing seemingly absurd or eccentric solutions); c) Think of as many ideas as possible; d) Take over and develop the ideas of others.
- The third stage takes place 1-2 days after the brainstorming session. An evaluation committee analyses and selects valuable ideas, picking the most appropriate solutions to the discussed problem.

To be effective, eliminating critical judgments is probably the most important rule of brainstorming because such critique can be paralyzing, being the enemy of imagination.

Brainstorming may not be the best approach for every problem, though. For example, it might not be as effective for highly technical problems that require specialized knowledge or for sensitive issues that could lead to heated emotional discussions. However, it works particularly well for problems like the one in our example that require innovative, out-of-the-box thinking.

Now let us delve into an example:

Exercise: *Designing an ideal classroom*

Objective: The purpose of this exercise is to generate creative ideas on what an ideal classroom should look like to enhance teaching and learning. The aim is to encourage creative thinking and collaboration among students.

Instructions for Brainstorming:

1. **Group Formation:** Divide the students into groups of 5-12 people, ideally with a good mix of personalities and abilities. Make sure to remind the group about the importance of voluntary participation and respectful relations.
2. **Role Assignment:** Assign a leader and a secretary for each group. The leader will facilitate the brainstorming session and ensure the group follows the rules of brainstorming. The secretary will take notes on the ideas generated during the session.
3. **Problem Identification:** The problem to be discussed is “What would an ideal classroom look like?” Inform the students about the brainstorming session a couple of days in advance, giving them time to think about the problem and formulate ideas.

4. **Brainstorming Session:** In the actual session, the leader states the problem and outlines the four rules of brainstorming: no criticism, encourage wild and seemingly far-fetched ideas, aim for quantity, and build on the ideas of others. The brainstorming session should last around 15-30 minutes, allowing for the free flow of ideas.
5. **Idea Generation:** Students take turns to suggest their ideas on the design of an ideal classroom. This could include ideas about physical layout, technology integration, teaching methods, student collaboration spaces, etc. The secretary records all the ideas, without any judgement or criticism from the group.
6. **Idea Evaluation:** After the brainstorming session, allow for a cool-down period (1-2 days). Then the group (or a committee) reconvenes to review the ideas, eliminate duplicates, merge similar ideas, and evaluate them based on feasibility, impact, and other relevant criteria.
7. **Selection and Presentation:** The group selects the most valuable ideas and prepares to present them to the class. The presentation could take the form of a written report, a poster, a 3D model, or even a digital design.
8. **Reflection:** After the exercise, encourage students to reflect on the process, the ideas generated, and what they learned from the brainstorming session.

This exercise encourages students to think creatively about their learning environment and what changes could make it more effective. It also provides a practical lesson on the brainstorming process and collaborative problem-solving.

1.2.2. *The 6-3-5 method*

The 6-3-5 method also capitalizes on the group's creative potential. A larger group of people is divided into groups of 6 (Fustier, 1988). Each group member has a sheet of paper in front of them, which they divide into three columns. The leader states the problem, and the group members write down three ideas, one in each column. Then each participant passes their sheet to their neighbour on the right and takes, in turn, the sheet from their neighbour on the left. Each individual then works on the ideas they have received from the person next to them, by providing additions, improvements and clarifications. The sheets are then passed along, as previously explained. The rotation is done five times until the ideas issued by each member of the group are seen by all the others. In the end, the leader collects all the sheets of paper, reads them in front of everyone and discusses which are the best proposals.

This method is called 6-3-5 because 6 group members issue 3 ideas and each idea is processed by 5 people (Fustier, 1988). Through this method, large amounts of ideas are obtained. Even if some of them will end up repeating and others will be trivial or too

general in relation to the problem under discussion, there will still be a sufficiently large and varied number of solutions to choose from.

The following example can offer more insight on how the 6-3-5 method can be used with a group of pedagogy students.

Exercise: *Improving classroom engagement*

Objective: The purpose of this exercise is to stimulate creativity and generate solutions for improving student engagement in the classroom, which is a common challenge faced by educators.

Instructions for the 6-3-5 Method:

1. **Group Division:** Divide the students into groups of six. If you have more or fewer students, try to keep groups relatively small and balanced. Each student in the group should have a sheet of paper and a pen.
2. **Set the Problem:** State the problem or topic of focus: "How to improve student engagement in the classroom?" Make sure the problem is clearly understood by all group members.
3. **Idea Generation:** Each group member should divide their paper into three columns. In each column, they should write down one idea to improve classroom engagement. These ideas can range from specific teaching strategies, technological tools, changes in classroom setup, etc.
4. **Idea Exchange:** Once all group members have their three ideas written down, they should pass their sheet to the person on their right. Now each student should have a new sheet of ideas in front of them.
5. **Idea Expansion:** With the new sheet, each student should expand, clarify, or build upon the ideas they have received. They can write their contributions underneath the initial ideas.
6. **Continue the Rotation:** Repeat the process of passing the sheets to the right and expanding on the new ideas until each student has contributed to every other sheet.
7. **Discussion:** After the rotation has been completed five times, have each group member read out the ideas on the sheet they currently have. As a group, discuss the ideas, merge similar ones, and pick out the best or most promising strategies.
8. **Reflection:** Finally, encourage each student to reflect on the process and the ideas generated. Which strategies did they find most compelling, and why? How can they apply these strategies in their future teaching practice?

This exercise will help students to think creatively about solutions to real-world class-

room problems, practice collaboration and brainstorming skills, and learn from their peers' perspectives.

1.2.3. *The panel discussion*

The panel discussion (panel = jurors, experts) is a method based on the use of a limited number of people (5-7) who have competencies on the topic under discussion, while an audience listens in silence and intervenes through written messages (Fustier, 1988).

The panel discussion takes place as follows: the experts sit at a table, and the audience arranges itself in a semicircle around them so that they can see and hear everything discussed by the panel. The discussion's moderator presents the theme and introduces the members of the expert jury. There is another person called the "message injector" whose role is to collect the slips with the messages sent by the audience to the jury. These notes contain the audience's questions, suggestions, and opinions (written on papers of different colours) that will be introduced into the discussion when an opportune moment arises.

The actual discussion takes place within the small group of experts, and the audience intervenes only through written messages. At the end of the discussion, the moderator summarizes and concludes. Panel discussions are also organized by television (and, more recently, by new media) outlets. Here, the audience can be present in the room or follow the discussion from home and intervene by phone or via the internet.

For this method, let's think of a group of secondary school pupils.

Exercise: *Panel Discussion on Cyberbullying*

Objective: The aim of this exercise is to raise awareness about the issue of cyberbullying, its effects on students, and strategies for prevention and response. This exercise can also be used to foster critical thinking and active listening skills among the students.

Instructions for the Panel Discussion:

1. **Panel Assembly:** Assemble a panel of experts on the subject. These could be the school guidance counsellor, a local police officer knowledgeable about cyber-crimes, an IT professional, and possibly an older student who has studied or experienced cyberbullying.
2. **Set the Stage:** Arrange the classroom so the panellists are at the front, and the students are arranged in a semicircle facing them.
3. **Role Assignment:** Assign a responsible student as the moderator who will introduce the topic, present the panellists, keep the discussion on track, and summa-

size at the end. Also, assign a student as the “message injector”, responsible for collecting and delivering messages from the audience to the panellists.

4. **Discussion:** The moderator introduces the topic - “Understanding and Addressing Cyberbullying” - and each panellist. Panellists are then invited to share their views, experiences, and recommendations related to the topic.
5. **Audience Participation:** During the panel discussion, students write down their questions, thoughts, or suggestions on slips of paper. These could be about understanding the implications of cyberbullying, the role of social media, the responsibilities of individuals, families, and schools, etc. They pass these slips to the message injector, who periodically delivers these to the panel for consideration and response.
6. **Summary and Conclusion:** After the panel has addressed the written messages, the moderator summarises the main points that have been made during the discussion. The discussion concludes with key takeaways or actions that students can undertake to prevent or address cyberbullying in their community.
7. **Reflection:** Following the panel discussion, have students write a reflection on what they learned, what surprised them, and how they can apply this knowledge in their lives.

This exercise allows students to engage with a critical and relevant topic while practicing respectful communication, listening, and note-taking skills. Additionally, it encourages them to think about their role in creating a safe and respectful online environment.

1.2.4. The Philips 6-6 method

The Phillips 6-6 method can be used when dealing with large groups of people. In order to obtain the direct and personal participation of all group members in the activity, this method proposes dividing the large group into smaller groups of 6 people, who will discuss a problem for six minutes (Fustier, 1988).

According to Sternberg (2005), the process works as follows: the topic of the discussion is announced, and then groups of 6 people are formed, each group choosing a coordinator. Coordinators have the mission to ensure the participation of all members in the discussion, to facilitate obtaining solutions and to note down the proposed solutions. Discussions take up to 6 minutes. After the time expires, each group makes its solutions known through the coordinator. The solutions of each group can be recorded on the board. The moderator can do the synthesis or there can also be a discussion between the group coordinators.

This method has the advantage that in a relatively short period of time (4-5 minutes for organizing, 6 minutes for the group discussion, 2 minutes for each group’s report and

20-30 minutes for the final discussion) (Fustier, 1988), many people are consulted, varied arguments are presented and numerous solutions are identified. In addition, group members get accommodated with debating, supporting a point of view, and listening to the other's opinions. The Phillips 6-6 method can be successfully used at school as a way to obtain arguments for and against an alternative course of action or to establish the causes of a more difficult situation in the group's evolution (Marinescu, 2009).

To exemplify, now let us imagine a group of teachers aiming to improve parent-teacher communication.

Exercise: Enhancing Parent-Teacher Communication

Objective: The purpose of this exercise is to gather creative ideas and strategies to improve parent-teacher communication. This is a common challenge in education and effective solutions can greatly enhance a student's learning experience.

Instructions for the Philips 6-6 Method:

1. **Group Formation:** Divide the teachers into groups of six. Try to create a mix of teachers from different grades and subjects to get a diverse range of perspectives.
2. **Role Assignment:** Each group should select a coordinator. This person will be responsible for facilitating the discussion, ensuring everyone has a chance to participate, and noting down the group's solutions.
3. **Set the Problem:** State the problem or topic of focus: "How to enhance parent-teacher communication?"
4. **Idea Generation:** Each group discusses the problem for six minutes, generating as many ideas as possible. The coordinator keeps track of time and records the proposed solutions.
5. **Solution Presentation:** Once the six minutes are up, each coordinator presents their group's ideas to the larger group. These solutions can be written on a board so everyone can see them.
6. **Final Discussion:** The group then engages in a final discussion, where they can discuss the different ideas, ask questions, or seek clarifications. This discussion could last around 20-30 minutes, but it can be adjusted based on time constraints.
7. **Reflection:** After the exercise, ask teachers to reflect on the process and the ideas generated. What did they learn from other groups? Which ideas do they think are most promising, and why? How can they implement these strategies in their own interactions with parents?

This exercise will help teachers to think critically about their communication strategies, learn from their peers' experiences and ideas, and collaboratively solve a common chal-

lenge. It also offers practice in efficient discussion and debate, and in presenting and supporting a point of view.

1.2.5. The creative problem-solving method

In recent years, creativity development programmes have increasingly focused on creative problem-solving (Marinescu, 2009). Such programmes start from the idea that finding solutions is not a blind attempt but requires a focus of attention on the different stages of the problem-solving activity in order to reach an optimal solution. stemming from Bejat (1981). This trend is further corroborated in academic literature. For instance, Cropley (2011) underscores the significant focus on creative problem-solving as a primary strategy for nurturing creativity, emphasizing that systematic problem-solving forms the bedrock of innovative solutions.

Each student can be trained in the direction of developing an open attitude towards the situations they face; of searching for and analysing as many alternative solutions as possible; and of discovering the possibilities of applying the solutions.

The models of creative problem-solving refer, in essence, to the steps that must be taken to solve problems, according to Săvăstru (2004):

- Identification of the problematic situation, areas of interest, challenges, possibilities and opportunities.
- Data collection. This is the stage in which the participants identify and gather the necessary information, painting a picture of the entire situation that is as clear as possible.
- Formulating the problem. This probably represents the most difficult stage of the creative problem-solving process.
- Idea discovery is the stage that involves generating as many ideas as possible to solve the problem. What is vital is that the participants expand the limits of their thinking.
- Establishing the solution implies establishing the criteria for evaluating obtained solutions. These criteria can relate to costs, time, utility, and applicability.
- Realization of ideas: the stage in which the obtained solutions must be put into practice. The result of this phase is an action plan.

Creative problem-solving is a technique, a way of working that can be practised in the classroom and can be easily mastered by students. Tomşa (2005) draws attention to the fact that the experience of dealing with a variety of problems and the practice of solving procedures can contribute to the development of a new way of thinking, creative attitudes, and critical spirit.

Let us imagine a situation where we want to plan a school-wide sustainability project using problem-solving.

Exercise: *Planning a School Sustainability Project*

Objective: The goal of this exercise is to guide students through a creative problem-solving process to develop a plan for a school-wide sustainability project.

Instructions for the Creative Problem-Solving Process:

1. **Problem Identification:** Introduce the topic: “Our school needs to be more sustainable. What can we do?” Break the students into groups and ask them to discuss the current situation at school in terms of sustainability.
2. **Data Collection:** Assign the students to gather data related to the school’s environmental impact. This could involve researching the school’s energy usage, waste production, recycling efforts, water usage, etc. They should present their findings to their group to ensure everyone has a clear understanding of the current situation.
3. **Problem Formulation:** After gathering and discussing the data, each group should define the problem as they see it. It might be something like “Our school is producing too much non-recyclable waste” or “Our school is consuming a lot of electricity”.
4. **Idea Discovery:** This is the brainstorming stage. Ask each group to generate as many ideas as possible to solve the problem they have identified. Remind them to think broadly and encourage creative, out-of-the-box thinking. No idea is too crazy at this stage!
5. **Establishing the Solution:** Each group should discuss their ideas, considering the feasibility, cost, time, and potential impact of each one. They should then select the best idea or combination of ideas as their proposed solution.
6. **Realization of Ideas:** With their solution in mind, each group should develop an action plan for implementing it. This plan should include specific steps, resources needed, a timeline, and any potential obstacles and their solutions.
7. **Presentation and Reflection:** Each group presents their plan to the class, explaining the problem they identified, their chosen solution, and their action plan. The class can discuss each plan, offering feedback and additional ideas. After the exercise, students should reflect on what they learned from the creative problem-solving process and how they might apply it to other problems in the future.

This exercise provides a practical and meaningful way for students to practice creative problem-solving while also addressing an important real-world issue. It encourages

them to think critically about their environment, collaborate with others, and take initiative to bring about positive change.

1.3. Creative teachers – creative students

Apart from the skills required for teaching and related activities (including subject matter expertise), teachers must be capable of establishing interpersonal relationships with ease. The art of teaching others relies on communicating and creating an essentially personal experience. The act of creation, i.e., self-expression in the pedagogical relationship, is connected with the so-called “art of teaching” (Stoica-Constantin, 2004).

Stimulating activism and creativity in school, in general, and in the teaching process, in particular, involves fostering an interactive, stimulating and dynamic learning environment (Marinescu, 2009). Cooperative learning ensures the development of a field of optimal relationships that encourage any student’s creative and active behaviour in the classroom. This method of cooperation develops and maintains internal epistemic motivation, favouring participants’ active involvement in the task their and creative, original contributions. The teaching staff’s creative practices are one of the factors that ensure the development of students’ creative potential. Teaching, as a creative process, requires the teacher to mediate between the student and the surrounding world. It simultaneously becomes a teaching-learning-evaluation activity, with superior training resources, permanently perfectible in a strategic and operational sense.

The teachers that display a proclivity towards creative behaviour (inventiveness, innovation) not only organize the space and the activity but also participate with students in the development of knowledge. They act as a role model for building interpersonal connections, encourage cooperative interactions among students and guide students in how to use their learning time, space, equipment and materials efficiently. Creative teachers ought to guide the individual or group into extracting the necessary information, values and useful resources from experiences. In this sense, the former must be able to interpret student actions and evaluate them continuously, in a formative, but also a normative spirit (Stoica-Constantin, 2004). The atmosphere created by the teacher in the classroom is a factor that influences the student’s learning behaviour. Establishing a climate favourable to a fruitful collaboration between the teacher and students - an environment characterized by an affective, positive overall tone (in which requirements and understanding are balanced), one of assumed responsibility - is a core condition that must be met as lessons are delivered.

A teacher with a creative approach understands the power of inquiry (Stoica, 1983). Each act of creativity is sparked by questions, but these questions should be open-ended and significant, not just leading to preordained responses. Operational questions

that inspire exploration and cultivate curiosity are effective stimulants of creative behaviour, thereby fostering creative learning. To nurture creativity in the learning process, it's crucial to encourage students to put in personal effort, make unique contributions, and embrace their originality and inventiveness (Roco, 2004).

The responsibilities of a teacher extend beyond the initiation and conclusion of a formal lesson. Teachers must know the creative potential of each student and the methods of enticing the latter; notice the creative manifestations of students outside of teaching hours; and make students aware of their own abilities, while also developing the aptitude and habit of self-evaluation (Marinescu, 2009).

An important role in creating a climate conducive to the stimulation and development of interactive-creative learning (Gruber et al., 2005) is held by the teachers' attitude toward the students' creativity and the former's capacity to deal with problematic situations by actively getting involved. The aspirations of students, and the educator's moral and intellectual values interact during each lesson. What the teacher values and promotes, the student will also end up valuing, more or less consciously.

Creative teachers determine the momentum of their students' creativity without much effort. The secret lies in transferring the set of values favourable to creativity from the mentor to the disciple - a phenomenon followed by the self-development and self-formation of the latter according to the attitudes and beliefs that have now been incorporated from the former (Stoica-Constantin, 2004). Similarly, things happen in the case of rigid and conventional teachers. Non-creative teachers will disapprove of a creative student's specific behaviour (independence in approaching and analysing problems, curiosity, the spirit of contradiction, non-conformism - within the limits of common sense), thereby inhibiting the start of possible innovation. In the same vein, non-creative teachers will encounter difficulties in identifying students with a propensity toward elevated creativity, by underestimating them.

A good teacher (Gruber et al., 2005) allows students to take intellectual risks, (positively) speculate, and make unsuspected associations, while offering support in situations of frustration, failure, insecurity or ambiguity. It is recommended that enlightening materials and sources of correct, validated information be made available to the students.

The active and creative student (Gruber et al., 2005) displays a lot of courage in the critical assessment of a product, independence in approaching and analysing problems, and an inclination towards providing counterarguments. Furthermore, the general behaviour of creative students displays a certain sense of "freedom".

The non-conformist behaviour (Sternberg, 2005) that is strongly expressed in the creative activity, should not be interpreted by the teacher as an undisciplined attitude, proof

of impoliteness or outright lack of respect. Of course, separating these nuances is by no means easy, but once teachers discover that they are not dealing with disrespectful attitudes, they should abstain from punishing students and try to create a favourable climate in which creativity can flourish.

The active and creative student is characterized by independence when approaching assignments and disregard for cognitive barriers. Creative students show a strong and unusual tendency to explore and create (Stoica-Constantin, 2004). Furthermore, they are less interested in teamwork and tend to draw up a personal work plan, keeping in touch only with a limited number of colleagues. Creative individuals have a higher level of aspirations; their interests vary; they show a lively and permanent curiosity; they involve themselves in problems that sound interesting, proposing “outside the box” ways of thinking.

Students with high creative potential have confidence in their own strength and are capable of correct self-evaluation (Sternberg, 2005). When engaging those around them, they control their behaviour (Roco, 2004) in an attempt to present a good image of themselves in front of both teachers and colleagues. Interactive-creative learning requires intellectual and practical effort both on the part of the students and on the part of the teacher who coordinates the activity’s smooth running.

Creative learning takes place when the student acquires a new experience through his/her own powers, after a process of discovery and practice in diverse settings. It emphasizes learning through research-discovery (Marinescu, 2009) and learning through own effort - either independent or directed (Tomşa, 2005). Above all, creative thinking highlights operational intellectual endowment, thinking and creative imagination. Students must have the liberty to doubt the ideas with which they come in contact, to research them and then, only if convinced of their validity, to adhere to them. Likewise, students must have the right to make mistakes, under the premise that creative mistakes are more important for cognitive development than correct or appropriate answers.

The activism of the student involved in the strategies used by teachers in the teaching-learning activity constitutes an imperative of the postmodernist orientation in education (Marinescu, 2009). The postmodernist school must know how to motivate the student to learn and how to facilitate the learning process, by organizing and developing interactive work strategies and emphasizing the usefulness of knowledge and the need to acquire it to properly navigate adulthood (Marinescu, 2009). The role of the teacher is not to fill the minds of their disciples with various types of knowledge, but to show the latter how to handle knowledge and what to do with it, once acquired.

If students are not able to use in practice what they have learned, they will end up having purely theoretical knowledge without any real-life application (Stoica-Constantin, 2004).

In education and training, the effective combination of both aforementioned aspects must be taken into account. Transmitting information should not be the teacher's goal. A teacher must create offers to stimulate and differentiate the student's cognitive structures (Marinescu, 2009) through training activities designed at the level of the interdependencies between the teaching-learning-evaluation actions.

Teachers and students must work together, promote dialogue methods, and favour guidance and negotiation processes. The teacher-student collaboration, however, does not mean reducing respect for the former (Marinescu, 2009); rather it emphasizes the need to resize the relationship, by considering the double meaning of the instructive-educational flow (the reciprocity of learning), granted that teachers also have to learn from the students.

2 Conclusions

Cultivating creativity in students is not only desirable but vital within the modern educational process, requiring keen insight and dedicated effort from educators. Our exposition offers an array of strategies and techniques that teachers can employ to nurture the creative spirit within their students, including the dynamic use of brainstorming sessions, the stimulating 6-3-5 method, thought-provoking panel discussions, the useful Phillips 6-6 method, and an intelligent approach to creative problem-solving. By integrating these methodologies, teachers can assist their students in honing indispensable life skills such as critical thinking, efficient problem-solving, and effective communication.

The use of brainstorming groups is an excellent technique for promoting creativity among students, creating a platform for them to churn out a plethora of ideas in a non-judgmental environment. This approach instills in students the confidence to express their innovative thoughts without the trepidation of rejection or criticism. The 6-3-5 method takes this concept a step further, with six participants each producing three unique ideas within a concise five-minute time frame, thus encouraging rapid, creative thinking. These ideas are then collectively explored and enhanced within the group, further stimulating creative engagement.

Panel discussions offer yet another avenue for the promotion of creative thinking among students. By assembling a varied group of individuals, each with unique perspectives and experiences, panel discussions can stimulate innovative ideas and present fresh approaches to problem-solving. These discussions foster a sense of community and collective creativity that can be beneficial in various situations.

Another resource at teachers' disposal is the Phillips 6-6 method. This technique, simi-

lar in structure to the 6-3-5 method, requires six participants to formulate six ideas each within a predefined time frame. This approach encourages a rapid generation of ideas, promoting creative thinking under time constraints.

An integral part of our approach to promoting creativity in students is the creative problem-solving technique. This method encourages students to dissect complex problems into manageable parts and generate multiple solutions for each part before selecting the most viable overall solution. This method not only helps students tackle complex problems but also equips them with the skills to approach any challenge creatively.

This chapter also emphasizes the importance of having creative educators in promoting creativity among students. Teachers, who are open-minded and creative themselves, serve as inspiration for their students, encouraging them to think unconventionally and explore novel ideas. When teachers exemplify creative thinking skills, students are more likely to absorb and apply these skills effectively.

Moreover, we underscore the necessity of cultivating an environment that inspires creativity. Teachers can do this by providing opportunities for students to express their ideas openly and without the fear of judgment or criticism. By nurturing a supportive and secure environment, teachers can aid their students in developing the self-assurance and skills needed to freely express their creative ideas.

In summation, teachers, equipped with these techniques and tools, can foster creativity in students, develop an atmosphere that stimulates creative expression, and model creative thinking skills themselves. Through these measures, educators can effectively prepare their students to navigate and succeed in our rapidly evolving world.

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Chapter 2.4

Educational Strategies For Teaching Creativity

Abstract:

The origin and development of creativity in human beings is one of the issues that disciplines such as Psychology, Biology, Health Sciences, Arts, or Educational Sciences have addressed in recent decades. Genomic advancement, neural networks and their plasticity is providing pedagogues and educators with very valuable information for the development of new teaching methods that favour the development of creativity as an important part of the entrepreneurship process. In this chapter we will present some current examples of this pedagogical development that could be used in different educational levels to foster creativity. Flipped Classroom and Problem-Based Learning (PBL) will be described as appropriate and relevant strategies at classroom.

Keywords:

Entrepreneurship Education, Flipped Classroom, Problem-Based Learning (PBL)

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Structure of chapter:

1. Introduction and purpose of the chapter
2. Creativity in Education: what strategies can we use at school to promote creativity in students?
 - 2.1. *Problem-based learning*
 - 2.2. *The Flipped Classroom*
3. The “Leapfrogging” Model: a way to develop creativity in teaching?
4. The “Leapfrogging” Model: a practical example
5. Conclusion
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1 Introduction and purpose of the chapter

It is common nowadays to hear or read about the need to develop creativity at school, because it has

been neglected in past decades and because it is very important for the integral development of students. Thus, we seem to be moving from an education in which creativity was not promoted and from which creative people were excluded, to one in which creativity, together with other mantras such as sustainability, climate change or gender perspective, will replace an education system loaded with too much content, in which everyone will be creative.

But is this really like this? What are the roots of human creativity? Can it develop in a “vacuum” or does it require associated content? Can all students develop high levels of creativity? Can we apply specific models and strategies for the development of creativity? If we can look deeper into these questions, we will be better prepared to teach our students to be more creative and to use this creativity in everyday life to solve academic, everyday or - in the future - professional problems.

In this chapter we suggest a model and coherent methodologies so that any teacher can undertake the challenge of teaching creativity starting from the traditional forms of teaching which, on the other hand, are still without doubt an essential pillar of the educational systems.

Thus, the chapter:

1. We describe two methodological strategies that can be used for the development of creativity (flipped classroom and problem-based learning) and a working model for integrating them into teaching.
2. A practical proposal is included as an example of the use of the model and the strategies indicated.
3. We show a series of ideas that can be adopted by teachers who wish to implement the ideas presented in the chapter in their teaching.

2 Creativity in Education: what strategies can we use at school to promote creativity in students?

As we have indicated above, whatever behaviour or activity a human being engages in, creativity has a biological component - genetic, a family and neighbourhood component, and a social learning component - formal, non-formal or informal. And it is im-

portant for us to implement the multidisciplinary evidence on the origin of creativity in non-human animals and humans from an evolutionary perspective.

On the other hand, creativity - understood as a skill or competence - can be measured, through instruments such as the Harris Creativity Index (Harris and de Bruin, 2017) which can provide data on relevant creative skills and abilities, and this enables teachers to develop pedagogical procedures that can enhance creativity within schools.

Why is it so important to know the roots of creativity if we want to promote it in education? It is certain that many teachers, even the majority, do not consider this fact: the deep evolutionary root of human creativity, and thus miss the basic perspective for its teaching: that human beings have an innate capacity to develop creative processes and that, therefore, we only need to turn to strategies that bring out this evolutionarily developed capacity, to obtain good results in most individuals. While in daily life, those individuals with greater creative capacity are able to solve problems and undertake enterprises with greater ease and efficiency, the opportunity to improve these capabilities is in the educational environment and, above all, in compulsory schooling, which, in advanced or technified countries, covers at least 10 years of an individual's life. And the school is a place where organized, sequenced and measurable educational programs can be developed. Thus, school and education in general, become a powerful instrument to improve the capabilities of all individuals, including the ability to be creative in the handling tasks and problems.

Among the methodologies that we can suggest for the development of creativity in educational environments we can mention interdisciplinary approaches such as Problem-Based Learning (PBL) and the "Flipped Classroom". We describe briefly these two strategies or methodologies as the most appropriate to foster the development of creativity in formal and non-formal learning environments.

2.1 Problem-based learning

Learning as exploration and discovery has several identifiable key processes. These include reflection, abstract conceptualisation, active experimentation and real experiences. According to various authors, they participate in the process of entrepreneurship and encourage the development of creativity. Thus, from this perspective, education uses different learning processes and the student, within them, is an active producer of his or her own knowledge and the teacher is limited to guiding students and encouraging discussion among them (Löbler, 2006).

Problem-based learning is a learning system that requires the student to be involved

in the teaching process. It does not focus on the teacher as the key to explaining the content and solving the problem. The key element is a problem that requires a thorough study by the learner, and prior knowledge that must be activated to reflect on the problems, with questions arising from the difficulty of the problem and through motivation to seek sources of information to answer them. (Moust, Bouhuijs and Schmidt, 2007). Problem-based learning is a technique used in constructivist learning environments, in which there is a problem that students must solve by seeking and obtaining information and appropriately applying the concepts learned (Jonassen, 2000).

The basic premise of problem-based learning is that collaborative learning is integrated as a basic strategy for consensus building through the cooperation of group members, which requires students to take on new roles and develop different skills for classroom work. These collaborative learning environments seek to promote spaces that allow for individual and group development, bringing into play discussion skills among students, who are thus responsible for their own learning.

The organisation of information is intended to lead to the “growth” of the group (Lucero, 2003), as the best way for students to develop new knowledge. The need to articulate and explain their ideas to the group leads to them being formulated in a more concise and precise way, which fosters the ability to listen and synthesise information.

The learner, through previous knowledge and the establishment of meaningful relationships with the context he/she faces, recognises new learning, which is more effective than learning facts analysed or implemented by others (the teacher, textbooks, etc.). It is easier to learn something if you are aware of situations where this knowledge can be applied in a particular context - it becomes relevant to that context. That is, integrating new knowledge with what you want to learn is more effective than learning facts or concepts by heart (Vinagre Laranjeira, 2010). In *Problem Based Learning*, the student must be able to study on his or her own without being constantly “fed” by the teacher, which requires discipline on the part of the students, as well as attention from the teachers to students who demand or need it.

We invite the reader to think about whether he/she has ever experienced a more bitter taste than usual in coffee, because the sugar has not dissolved and has remained at the bottom of the cup. If so (if you cannot do an experiment) try to solve in your mind the problem in a creative way.

Later we will give you our vision of how to deal with that problem in an educational environment, using the leapfrogging model that we will present later. For now, think about the problem we have proposed.

2.2 The Flipped Classroom

The use of technology in the classroom for curriculum development at any educational level is widely supported by scholars in this field, although there is still some discussion about the form and scope of its use and its results (Jiménez Landívar and Gijón Puerta, 2019). One of the most popular models for the use of ICT in the educational environment in recent years is the so-called “flipped classroom” (FC), which seems to encourage creativity and entrepreneurship in students.

The “flipped classroom” has been in widespread use since about a decade ago at Woodland Park High School, Colorado, USA. Chemistry teachers Aaron Sams and Jonathan Bergmann made and posted videos of classroom presentations on virtual platforms for students who could not - or would not - attend classes regularly. These teachers linked their work to a holistic approach to teaching, which interconnects instructional action with constructivist models, which implies giving importance to certain types of activities that promote autonomous learning and the development of competencies related to the search for, selection and use of information, as well as metacognitive skills (Bergmann and Sams, 2012; Basso-Aránguiz *et al.*, 2018; Santiago and Bergmann, 2018).

However, the inverted classroom methodology, as a didactic concept, dates back to the 1990s, developing at the same time as the advancement of the possibilities offered by the investment in ICT made by educational centres. Thus, the idea of devoting part of the class time to activities other than lectures, introducing others that involved greater mental activity (concept maps, flow charts, scenario creation, problem solving, work in pairs or small groups, discussions, etc.), already appears in authors such as King (1993) and it is later made explicit by others such as Crouch & Mazur, 2001; Mazur, 1997; Schell & Mazur, 2015, who initially referred to the model as *peer instruction*.

In the early 2000s, the concept of the flipped classroom became popular and it is defined in the literature simply as an alternative or “inversion” of traditional teaching (face-to-face lectures - individual or group work away from home), in some cases already linked to its inclusive potential (Lage and Platt, 2000; Lage, Platt and Treglia, 2000). It was subsequently adopted by various schools and institutions of higher education, although, as noted above, it was its use by Sam and Bergmann that brought it to international prominence (Bergmann and Sams, 2012). Parallel to the increase in information available on the Internet and the technical progress that has simplified the easy editing of videos or the creation of multimedia (Johnston, 2017) there have been many experiences with the flipped classroom in different parts of the world, mostly in the areas related to the natural sciences and to a lesser extent in those related to the humanities and social sciences.

We can define the flipped classroom as a pedagogical model in which the teacher

shares information sources (documents, photographs, audio, multimedia and, especially, videos) through a digital platform outside the classroom, in which students work asynchronously (Bergmann and Sams, 2012). In the classroom, a classroom model based on active methodologies will be developed in relation to the contents previously worked on by the students on the platform: individual work or work in collaborative pairs (Crouch and Mazur, 2001) to solve a problem or make progress on an ongoing project (Toto and Nguyen, 2009). The two basic features of the inverted class model, according to Bishop & Verleger (2013) are: (a) using computer technologies, such as instructional videos; (b) using interactive activities to promote learning through creativity.

Further clarifying the concept of the flipped classroom, the Flipped Learning Network (2014) distinguishes between “flipped classroom” and “flipped learning”, which requires methodological grounding on four pillars, as presented in Figure 1: flexible environment; learning culture, targeted content and professional facilitator.

Figure 1. Basic pillars of ‘flipped learning’

Pillar	Characteristics	Confirmatory keys
Flexible environment	It allows a wide range of learning styles to be involved. It creates flexible spaces in which students choose when and where they learn. It is flexible in terms of expectations of each student’s learning sequence and assessment of learning.	<ol style="list-style-type: none"> 1. I create spaces and time frames that allow students to interact and reflect on their learning. 2. I continually observe and follow up with students to make adjustments when necessary. 3. I offer students different ways to learn the content and demonstrate their mastery.
Learning culture	It shifts the responsibility for instruction to the learner, where classroom time is spent exploring topics in greater depth and creating richer learning experiences. Students are actively involved in constructing knowledge while evaluating and participating in their own learning, making it meaningful.	<ol style="list-style-type: none"> 1. I offer students diverse opportunities to engage in meaningful activities in which the teacher is not the centrepiece. 2. I lead these activities as a mentor or guide and make them accessible to all students through differentiation and feedback.
Directed content	Facilitators select what students are to explore on their own. Facilitators use targeted content to maximise effective class time by adopting learner-centred, active learning methods and strategies, according to their level and academic area.	<ol style="list-style-type: none"> 1. I emphasize the concepts used in direct instruction so that they are accessible to students on their own. 2. I create or select relevant content - usually videos - for my students. 3. I use differentiation to make content accessible and relevant to all students.

Pillar	Characteristics	Confirmatory keys
Professional facilitator	During class time, they follow their students closely and continuously, giving relevant feedback immediately and evaluating their work. A professional facilitator reflects on his practice, connects with other facilitators to improve their instruction, accepts constructive criticism and tolerates controlled chaos in their classroom. While professional facilitators have a visually less prominent role in a flipped classroom, they are the essential ingredient that gives rise to Flipped Learning.	<p>I am available to students to give immediate individual or group feedback as required.</p> <p>I conduct formative assessments during class time through observation and recording information to support instruction.</p> <p>I collaborate and reflect with other teachers and take responsibility for the transformation of my teaching practice.</p>

Modified from Flipped Learning Network (2014)

In short, the essence of the Flipped Classroom model is to ensure the best understanding of the content studied by students outside the classroom, under the guidance of the teacher in classroom sessions (Herreid and Schiller, 2013) through a process of creation or selection of materials, access to them by students prior to class, and work in the classroom by students, through active methodologies, on those contents previously studied. Thus, creative processes are continuously stimulated in the development of activities within the Flipped Classroom methodology.

3 The “Leapfrogging” Model: a way to develop creativity in teaching?

Based on the descriptions of the flipped classroom and problem-based learning methodologies, we propose a global work model for the development of creativity, with different stages. Firstly, we present the leapfrogging model and, secondly, an example in which the reader will be able to put the leapfrogging idea into practice, through a problem and working in inverted class. The metaphor “leapfrogging” has been used in the area of development to highlight the need (or the possibility) of skipping steps in the economic and social evolution of developing areas, so that they can be incorporated directly into the current technological development. We cite access to mobile telephones and their resources in African countries that have not advanced in other areas such as health or education but that, through this “leap”, could accelerate development in other areas (Lee, 2021).

We now present the use of this metaphor in the educational area and its possibilities

for teaching creativity. There are undoubtedly many methods and strategies for the development of creativity in educational institutions, such as those mentioned in the previous section, some of which are more transferable than others. The literature is full of references to active methodologies as a means of developing creativity, leadership, group work, entrepreneurship in students, etc. (Bolden *et al.*, 2020).

However, we believe that the basic methodological problem is to integrate creativity as a purpose to be developed in all students -to a greater or lesser extent-, starting from previous learning situations, which are the basis of creative development and whose methods can integrate both the most traditional and the most innovative ones. An educational model for primary and secondary education recently proposed by UNESCO, but which can be extrapolated to any other level, is called “leapfrogging” or “leapfrogg” (Instance and Paniagua, 2019).

The naming of the model, through the metaphors of the leapfrog and the references to the athletic speciality of the triple jump, takes us to a form of education in which, on the one hand, we can go further with the support of others - leapfrog metaphor - and on the other hand, it allows us to reach the highest levels of development with the support of previous knowledge and teachings -even with traditional methods-, by comparing teaching and learning with the three jumps - hop, step, jump - of the triple jump, which in the leapfrog model are called hop, skip, leap.

Thus, it is not possible to finish the jump if the first jump -hop- and the intermediate jump -step-, which requires a good execution of the first one, have not been executed correctly and in that order. The key elements of the model are organised around different cores, and one of them (Learning & Teaching), addresses the issue of creativity, placing it in a continuum that allows the transition from more traditional models to more innovative models, placing it as a “leap” purpose in the core of learning.

This way, the teacher can move from an organisation based on lectures, to the inclusion of interactive activities, and finally to the introduction of games and play activities alongside interactive activities and lectures. In the same way, the learner starts with learning by using memory and understanding concepts in order to, in the next step, implement and analyse them. And it is by adding evaluation and creation to these first two steps that he or she will reach a “leap” level, as shown in Figure 2.

Figure 2. Leapfrogging model: Teaching and Learning (Increasingly Student-Centred)

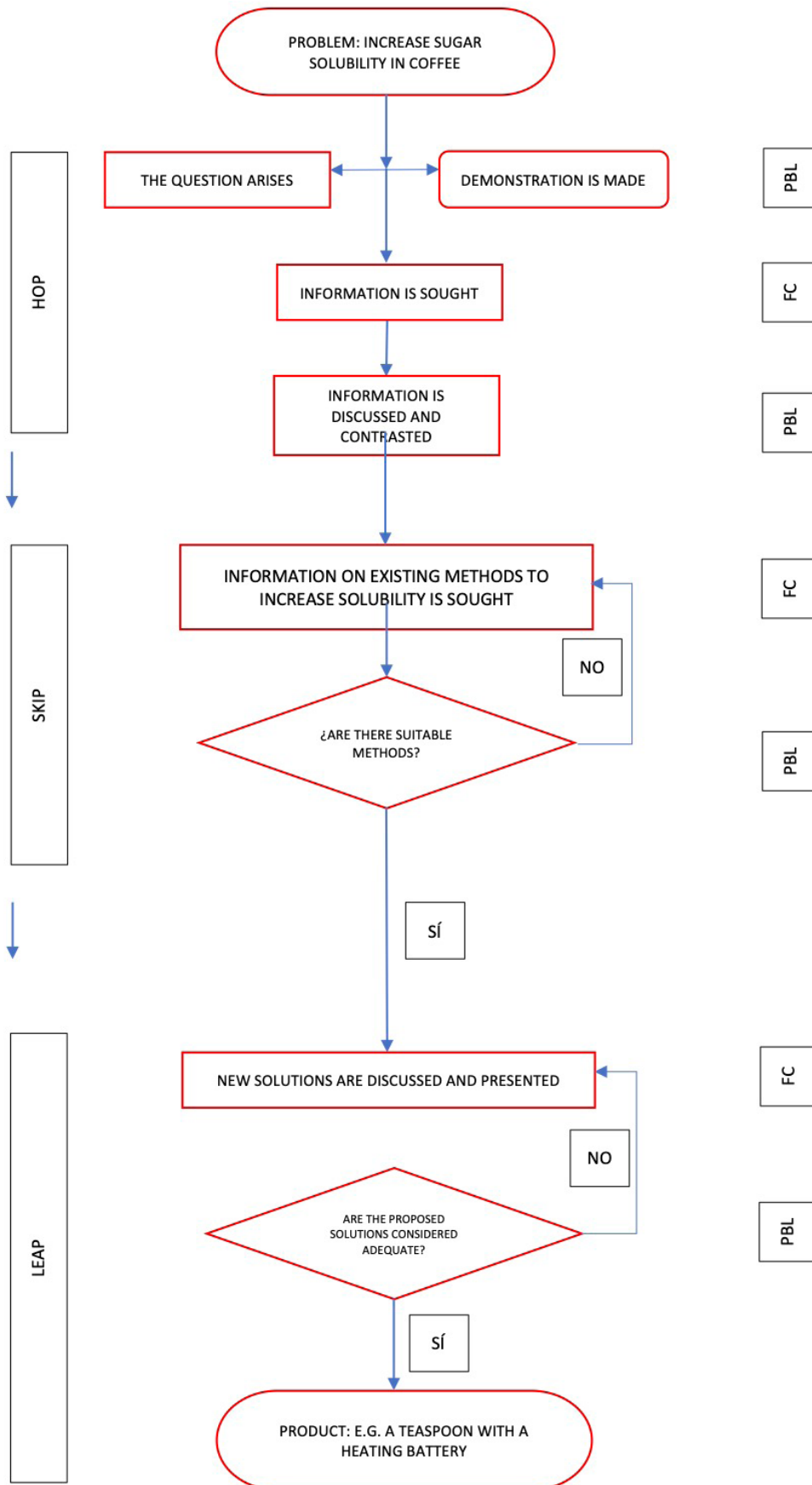
Teaching	Potential to leapfrog	Learning
Playful+ Interactive + Lecture-based	LEAP	Evaluate and Create (Creativity) + Apply and Analyze+ Remember and Understand
Interactive + Lecture-based	SKIP	Apply and Analyze+ Remember and Understand
Lecture-based	HOP	Remember and Understand

From Instance & Paniagua (2019)

4 The “Leapfrogging” Model: a practical example

Everything referred to so far may sound theoretical or curious, but not very feasible. Let us develop a simple example, with the complete sequence of activities, of the application of the leapfrogging model with the two strategies presented (flipped classroom and problem-based learning) to clarify its practical application in an educational context.

Earlier, the reader was asked to think about a specific problem: how to make sugar dissolve better in coffee. Well, I’m sure you’ve already thought of creative ways to do this - or maybe you couldn’t think of anything. We will now present how to approach this problem in a formal setting, using the leapfrogging (LF) model and the flipped classroom (FC) and problem-based learning (PBL) strategies. See Figure 3, as flow chart.



FC: Flipped Classroom; PBL: Problem-Based Learning

Figure 3. Leapfrog example, using Problem-Based Learning and Flow chart

We present a chronological sequence of the activities to be carried out. Let's imagine a course for adults on how to improve creativity. Let's imagine that we are going to start by trying to motivate the participants and, to do so:

1. We suggest that participants think about whether they have ever experienced a more bitter taste than usual in coffee, because the sugar has not dissolved and remained at the bottom of the cup. If so (if you can't do an experiment) try to solve in your mind the problem in a creative way (PBL). In any case, we could have a jug of warm coffee and sugar and do a live demonstration.
2. HOP
 - a) The first action should lead participants to know and understand that the solubility of sugar in coffee depends on two factors: temperature and pressure, i.e., by increasing the temperature of the coffee or increasing the pressure of the coffee, the sugar would dissolve better. That is, by increasing the temperature of the coffee or increasing the pressure at which the coffee is at, sugar would dissolve better. How could we teach the participants these concepts? One way is to give them links to videos or web pages where they can obtain this information (FC).
 - b) Once these websites or videos have been reviewed, participants will discuss what they have seen on the web about solubility, in order to check that they have understood the concepts.
3. SKIP
 - a) Small groups can now be organized so that they can look at ways to increase the temperature (increasing the pressure will certainly not be considered possible in the case of making and drinking coffee). We can also use web links or videos that participants can watch and comment on and then share with the trainer (FC).
4. LEAP
 - a) Once we know, understand and have analyzed examples of the proposed problem, it is time to come up with creative solutions (PLB). To do this, individually or in groups, participants must propose "new" or "novel" solutions - at least for the participants. These solutions will be presented to the other participants and evaluated by the group of participants.

5 Some concluding remarks about education and creativity

In this sense, there are two ways to include creativity competence in the curriculum: a) a generic one, in which students are exposed to problematic situations in which they have to bring their creative skills into play and mobilise all kinds of resources to solve them; and b) a specific one, in which specific tasks are established that students must be able to carry out at different times and subjects, and which will be graded through rubrics that indicate the level of achievement attained in the execution of each task.

In the first case, we find ourselves in a situation like that of the basic competences recommended by the European Union to be developed throughout life in the education systems of the member countries (European commission. Education and Training, 2019; Sala *et al.*, 2020) which are a general educational reference in the development of subjects and their contents.

Secondly, we are dealing with a curriculum design by competences, in which creativity has its own space and in which students' achievements in the development of this competence would be assessed. The studies we have mentioned on enriching and stimulating environments for creativity provide evolutionary arguments to support these proposals (Owen *et al.*, 2005; Cannon *et al.*, 2016).

As a second conclusion or reflection, we can say that there are different ways and levels to promote creativity in our students, which will depend a lot on the teacher's style and his or her initial training and professional development. And surely all these ways will serve to improve the levels of creativity in students.

Finally, we must understand that creativity is linked to many other cognitive and psychomotor skills, as well as to personal attitudes, so its development should be linked to other competencies, such as leadership, teamwork or problem solving. Likewise, creativity is probably a skill that needs prior learning and knowledge from which to develop, so it might be advisable to approach it at times when the curriculum is advanced, although this will depend to a large extent on the teaching style of each teacher.

Human beings live in a unique, yet consistent way. The study of their lives and abilities is parcelled out to easily access certain aspects of their biology, psychology or emotions. But it is the outcome of these interactions that determines how each person will be and act when faced with problematic situations and complex tasks. Individual capacities, modulated and enhanced by social learning, are what enable societies to advance towards greater well-being. And it is in this context that creativity, its learning and teaching should be understood.

Thus, as a third and final conclusion, we must encourage the reader to go deeper and

learn more about the roots of their creativity and the different models and methods that exist to promote it, especially in formal educational spaces, at any level -from preschool to university- and, of course, in lifelong learning.

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Theme 3

Pedagogies for entrepreneurial learning and education

Chapter 3.1

Enterprise Education – Developing and structuring positive learning experiences

Abstract:

Enterprise education is less about what we teach students and more about how students learn. For learning to be effective, teachers must address two essential concerns, firstly, constructing an appropriate learning environment and secondly, designing and delivering enterprise learning activities which develop not only student knowledge and understanding of enterprise, but also provide opportunities for learners to develop a full range of entrepreneurial competencies, ideally in real life scenarios. The chapter recommends a ten-point educational strategy for enterprise education in schools, with a process of designing and delivering effective enterprise learning experiences. This provides an agenda for professional development through Enterprise Education as a vehicle for school and college improvement.

Keywords:

Enterprise; education; schools; learning design

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Chapter Structure:

1. Introduction
2. Creating a positive environment for successful enterprise learning.
3. Developing a vision for Enterprise Education
4. Communicating the approach to enterprise education
5. Auditing present provision and planning for new development
6. Planning and coordination
7. Allocation and targeting resources for enterprise education learning and staff development
8. Encompassing the moral and ethical dimension
9. Developing enterprise capabilities.
10. Student centred and activity-based learning
11. Recording, assessing and reviewing achievement
12. Evaluating and celebrating success
13. Designing and delivering effective enterprise learning experiences
14. Identifying an agenda for professional development
15. References

1 Introduction

It has often been said that enterprise education is less about **what** we teach the students and much more about **how** the students learn. For the learning process to be effective, teachers need to address two essential concerns, firstly, constructing an appropriate learning environment and secondly, designing and delivering enterprise learning activities which develop not only student knowledge and understanding of enterprise but also provide opportunities for learners to develop a full range of entrepreneurial competencies, ideally in real life scenarios.

2 Creating a positive environment for successful enterprise learning

We know that entrepreneurial learning needs to take place in an environment which supports risk, encourages students to believe in themselves and allows them to experiment. The discrete learning activities also need to be structured and designed to comply with these requirements. Constructing and creating this environment cannot be left to chance but needs to follow a classic cyclical quality management process encompassing Vision, Planning, Delivery and Review. The cycle starts with developing a vision, moves into planning and strategic decision making, before delivering the learning and, finally, evaluating and assessing the outcomes. There are no 'right answers', rather this is a structured approach which can be used by teachers and lecturers to build a bespoke learning environment which suits both their own experience and aptitudes and those of the institution and the community in which it is located. The most important aspect of this process is to avoid being too prescriptive, these are to be 'guidelines' not 'tramlines', with an emphasis on organic growth appropriate to the context and community setting that the school served. Engagement with the process is also aimed at providing an entrepreneurial professional development experience for school and college staff, a chance for them to experience 'start-up' as a curriculum-based endeavour and to generate a belief in their own entrepreneurial capabilities. Staff should be encouraged to see this as an opportunity to experience first-hand what their students will be expected to do and to empathise with the very real demands placed upon learners by the innovation process. The starting point for this review has to be to identify what we understand by the characteristics of entrepreneurial Schools and colleges.

Many of us will have visited schools which encapsulate the notion of being entrepreneurial. My research has identified the 10 specific characteristics which would seem to be essential (Hoare, 2012). This list of characteristics can be seen as a framework against which teachers/lecturers can audit the provision in their schools/colleges. This

approach also allows for a threefold process of a) creating a record of the existing provision, b) identifying any apparent gaps in the coverage and c) developing an action plan to address future developments

3 Developing a vision for Enterprise Education

The institution will have spent time developing their vision for enterprise education. This will ideally have been developed through consultation with staff, students, and community stakeholders. The vision statement will encompass a shared understanding and definition of enterprise education to which all are signed up and which gives then a direction of travel. The school leadership team will have undertaken the consultation exercise with the aim of clearly identifying and agreeing their own understanding and definition of enterprise education, appropriate to their institution but also compliant with any regional or national curriculum requirements. This policy will have been established as a clear and defined entitlement for all learners. This entitlement will have been embedded into the annual timetable and apparent as an overt dimension of the curriculum offer. Enterprise Education will be seen as an entitlement for all. There should be evidence of the ways in which the provision allows for transition across Key Stages of the curriculum for different year groups and for progression in enterprise learning. The policy statements will reflect this, ensuring that all students are able to engage with the experience and take some ownership of the process, whilst acknowledging that some students may have varied learning styles. Student briefing will be scheduled in to the programme to ensure that they understand the importance of their role in contributing to the success of the programmes, with clear statements about the expected outcomes and benefits of their engagement.

Enterprise Education will be specifically referred to in the institution's development planning and improvement documents. There may also be a discrete enterprise education policy document. A strong component of this vision statement will be the attention paid to the moral and ethical dimension of enterprise education. All enterprise education activities will be structured so as to encourage equal opportunities. There will also be a statement as to how enterprise education contributes to the broader institutional commitment to ensuring equal opportunities for all learners. This should include a commitment to challenge stereotyping and to ensuring the inclusion of the widest possible group of participants.

The definition below was contained in the 2011 policy statement from the European Commission contain in report published as the Budapest Agenda (European Commis-

sion 2011) and provides a useful starting point for institutions to shape and contextualise their most appropriate approach to enterprise education.

“Entrepreneurship in this sense refers to an individual’s ability to turn ideas into action. It includes creativity, innovation, showing initiative and risk-taking, as well as the ability to plan and manage projects to achieve objectives. This supports everyone in day-to-day life at home and in society, makes employees more aware of the context of their work and better able to seize opportunities, and provides a foundation for entrepreneurs establishing a social or commercial activity. Entrepreneurship education is thus about life-wide as well as lifelong competence development” European Commission. 2011.

4 Communicating the approach to enterprise education

The institution will have communicated its vision for enterprise education to all its staff, students and to the wider community. This communication strategy will have been structured in such a way as to ensure maximum coverage and to allow feedback. It will also be linked into an ongoing staff development programme which reflects identified staff needs for additional training. The strategy will ensure that students will have been introduced to the concepts well before any activities take place. It is particularly important that they understand what they can expect to gain from their involvement if they are to engage with the process. These benefits should be identified as intended learning outcomes which will have longer term benefits for their personal development. All enterprise activities will be preceded by a student briefing which outlines the expectations and benefits of engaging with the activity. This obviously implies a requirement to ensure that the aims and objectives of any classroom activities have been agreed and are understood by all staff as a fundamental prerequisite to learning. The vision should also be shared with parents and other external partners, including local businesses and community organisation. Documents produced for this purpose will need to be written in ‘plain English’ given that they are addressing a lay audience.

5 Auditing present provision and planning for new development

The staff at the school will have been regularly auditing their existing provision for enterprise education right across the subject areas and including cross curricular and extracurricular experiences and mapping areas requiring more attention. This audit will show not simply what is delivered but also how the entitlement translates into classroom experience. Interestingly, exercises of this sort often identify areas of the curric-

ulum which are already delivering enterprising experiences but are failing to label them appropriately. Apart from anything else, this process can be reassuring for teachers who are wary of adding to their workload with yet another initiative. The audit should also consider how these enterprise education experiences are recorded and tracked, hopefully as a systematic approach to both coverage of themes and also as an incremental development of skills. These audits can sometimes identify disparate and rather patchy provision, with some students having much greater access to the opportunities than others.

Successful auditing will require strong support from senior management, clearly defined audit roles and responsibilities and the provision of appropriate resources to be able to carry out the process. All subject departments and student support agencies will need to be included if the full range of activities are to be identified. All list of suggested activities will be provided to aid the process but it is important that this list is not seen as prescriptive. There should certainly be a variety of activities, rather than an over reliance on similar types of experience. One of the benefits of an audit is the discovery of unintentional but effective enterprise learning opportunities and achievements which had previously gone unrecognised and undervalued.

The audit process should result in a document which maps existing provision and identifies any gaps and/or overlaps. This document should be made available to all staff, students, parents and community partners as a public document. The aim is to provide both a summative and a diagnostic outcome. The Audit should also be accompanied by an Action Plan, designed to address any omissions in provision. This Action Plan should be realistic and achievable, bearing in mind the resources available to bring about the required changes. Both the Audit and the Action Plan need to be seen as working documents which need to be revisited regularly, perhaps every year, as changes inevitably happen within the institution which impact on the overall provision.

6 Planning and coordination

The school will have adopted an innovative approach to timetabling and resourcing. In ideal circumstances, the leadership team will see the enterprise education initiative as a 'start up' which they can design and build to deliver for their community. To lead this work, there will be a designated coordinator, who, if not actually a member of the school leadership team, will have their full support and backing. This post will have a detailed job description, including performance descriptors, and high status in the school hierarchy. The coordinator's role is vital to keep track of exactly what is happening and where. Whilst some experiences will be designed as discrete programmes, many will

operate as cross curricular and extra-curricular events. There will also be a requirement to liaise with external partners, ensuring that their contribution is both appropriate and effective. Effective mapping should identify gaps but the omissions will then require attention to address the shortfall. The coordinator should also act as a quality control monitor, ensuring that the student experience is high quality and provides a positive learning experience.

7 Allocation and targeting resources for enterprise education learning and staff development

Adequate resourcing will have been made available by a leadership team committed to delivering excellence of provision. This commitment to enterprise education should appear as a formal statement in the school development plan and as identified time within the curriculum for enterprise education activities to take place. There will also be an allocated budget, ring fenced for spending only on teaching resources and staff development. The allocation and deployment of these resources should be tracked to ensure the most effective use of funding and also to ensure that they are not diverted to other curriculum priorities. These funds may also cover the cost of employing a dedicated member of staff with responsibility for coordinating the provision. The coordinator would also have responsibility for liaising with the full range of external stakeholders, funders and providers to ensure maximum support for student learning activities and staff development opportunities. It should go without mention that the school shows full compliance with child protection, health and safety and public liability regulations. This becomes a central issue for effective enterprise education, given that there will be a major reliance on partnerships with external community organisations. The audit will have identified many existing relationships and also opportunities for developing new ones.

8 Encompassing the moral and ethical dimension

Students should be required to consider the moral and ethical issues associated with all of their enterprise education activities. An excellent starting point when planning learning activities might be the United Nations 17 goals for sustainable development which provide a comprehensive list. (United Nations, 2015). It is most important that staff consider these issues when planning the learning activities and embed the discussions and the issues raised as an integral part of the activity rather seeing it as a bolt-on extra.

9 Developing enterprise capabilities

The curriculum offer should encompass activities which develop the full range of enterprise capabilities. Learners should be required to work as part of a team whilst making choices, applying decision making skills and engaging with problem-solving challenge activities. All of these activities should allow for supported risk taking and include the possibility of failure. Students should also be offered the opportunity to develop their communication, numeracy and IT skills. These should be embedded in the programme and feature as part of the briefing and debriefing process with students expected to give an account of their expectations and achievements. This should include financial literacy and capability, ideally through being given responsibility for handling money and financial decisions. Most importantly, the learning scenarios will focus on how goods and service are produced and provided, with some opportunities to actually design and build their own product/ service.

10 Student centred and activity-based learning

All learners should be encouraged to take on responsibility for their own learning through team working, decision making and problem-solving activities, as mentioned above. These activities need to be adequately varied to take account of the diverse backgrounds, experiences and abilities of the learning cohort. Whenever possible, there should be input from the local community, with not only visiting speakers but also opportunities for local businesses to reflect and comment on the curriculum planning intentions. Learning should take place outside of the classroom as and when appropriate.

11 Recording, assessing and reviewing achievement

The approach to student assessment should encompass both assessment **for** learning as well as assessment **of** learning. Students will be used to reviewing and evaluating their own performance as an ongoing process and in conjunction with their peers and with their teacher. The school will also have recognised the need to go beyond the measurement of knowledge acquisition to address the development of transversal skills. They will have identified a set of key knowledge, understanding and skills for enterprise which can form a focus for evaluation. Staff will have allocated time when they are expected to observe students at work and discuss progress with them. Review documents for use by staff and students will have been designed and agreed for use both during and after an event. External partners will also be contacted to ask for their

feedback. Both staff and students should be required to peer review their performance and report back their findings to a wider audience. These achievements will be systematically recorded, with students actively assisting in this process of building a record of their achievements.

12 Evaluating and celebrating success

Evidence gained will feedback into the school development process, informing planning for future years. All activities will be evaluated as a matter of course and the results feedback to the senior leadership team and interested outside agencies. The results should also contribute to the institution's broader self-evaluation processes. The school/college would also disseminate and celebrate its good practice in entrepreneurship education activities with outside organisations. This allows for networking and reflection.

13 Designing and delivering effective enterprise learning experiences

Research on enterprise education tells us that when designing programmes challenge experiences have to be at the core of the learning. The common theme here is student responsibility for their own learning. Teachers and lecturers creating learning experiences for their students need to consider not only what they are trying to achieve with that particular cohort but also the extent to which the activities reflect what their students can realistically be expected to achieve. Tasks have to be both challenging and achievable and the only way to ensure this is to start with a design framework which encompasses the four basic requirements which need to be embedded. These can be seen as a group of four continuum, with demands on student involvement along the continuum being set according to the age and maturity of the pupils, their previous experiences of enterprise education, their physical abilities and other considerations such as cultural expectations.

Quality enterprise education learning experiences need to be structured to comply with four basic requirements, namely:

1. Learners are presented with a challenge – this implies a move away from textbook learning and artificial constructs to identifying and tackling problems relevant to contemporary life. Local companies/social enterprises are often supportive in coming forward with realistic challenges.
2. Learners are required to take responsibility for their own learning- students are supported to manage their learning experience, to make decisions and reflect on

the consequences. Risk is an important element of enterprise education but it has to be within a supportive environment which acknowledges the demands of complying with health and safety and child protection requirements. These requirements are embedded as part of the learning experience, reflecting as they do the reality of working in the commercial environment where they are a non-negotiable part of working life.

3. Learning is located in the local community and operates as a partnership- opening the enterprise education experience to the world beyond the classroom gives both staff and learners access to a wide range of relevant and current resourcing
4. Learning results in real change- students experience the satisfaction of making a difference and are provided with an opportunity to develop their sense of self-worth and self-esteem.

Teachers and lecturers should be prepared to critique and rigorously review any tasks they use with their students. This is particularly important when teaching resources are 'bought in' from an external source but it also applies to 'home grown' products generated within the institution. This review process should be undertaken in a structured way to ensure that the task is fit for purpose. A starting point might be to check that it meets the basic four requirements for any enterprise education learning assignment, as detailed above.

1. Does the task present the students with an age/ability appropriate, real-life challenge, ideally developed in partnership with a community/ industry partner?
2. Does the task, whilst complying with all health and safety requirements, allow and support students to manage their learning in a community context, monitor their progress and reflect on their achievements?
3. Is the learning rooted in the local community, and, whenever possible, takes place beyond the confines of the classroom and in a way which includes all students?
4. Does the learning offer up solutions to the challenge set and result in observable improvements which the students can acknowledge and take individual credit for?

14 Identifying an agenda for professional development - Enterprise Education as a vehicle for school and college improvement

Initiatives to introduce effective enterprise education programmes are predicated on one major assumption, namely that we have practitioners who are both able and willing to act as enablers rather than just didactic deliverers of knowledge. The need is for teachers and lecturers who can create a learning environment which is both supportive and challenging and which gives learners the opportunity to show their full potential.

This process has been described as a 'scaffold' on which the students can create their personal interpretation of the task. Importantly, with this approach there are no 'right' answers but instead, many viable solutions.

It has been said that a bureaucratic environment engenders bureaucratic behaviours and that, by the same logic, an entrepreneurial culture is a basic requirement as a backdrop for entrepreneurial learning. The so called 'Hidden curriculum' often exercises as much influence, if not more, than the prescribed curriculum requirements. This raises the question of what an entrepreneurial school would look like and what are the characteristics of a truly entrepreneurial educational environment. These ideas are picked up by the Budapest report (op.cit) and presented as generic characteristics. These features were envisaged not as a random grouping of actions but as an entrepreneurial development process which would allow the institution to evolve its latent potential as an innovative and creative environment in which learners could develop to their full extent. This task, which has the potential to reshape some institutions, lies within the remit of the Senior Management Team. It could be argued that unless and until this process of institutional transformation, has been completed, students would still be being taught in a cultural milieu at odds with entrepreneurial development.

High quality enterprise education must encompass exemplary teaching and learning and that, in a school context, is truly transferable. The entrepreneurial school has a default setting as a successful school. Linking enterprise education to school improvement must be the goal and there is a sense that thus far, this has been understated. Senior Managers might justifiably ask the question whether it was possible to identify a causal link between a school/college adopting a more entrepreneurial approach to teaching and learning and improvements in overall attainment. Put simply, do entrepreneurial learners become more effective learners? Sadly, the evidence provided is largely inconclusive, perhaps because it is difficult to agree on a common definition of what it means to be an entrepreneurial learner. More research does indeed need to be undertaken to identify the links between institutional success and entrepreneurial culture. Research studies do show a consistent theme though in that provision for enterprise education is very patchy and certainly does not match up to the avowed desire of it being an entitlement for every student in every school. At worst, some students were reporting being turned off entrepreneurship, whilst other programmes achieved little in an educational sense, other than keep their students 'busy'. The most successful programmes were invariably founded on a coherent and well-resourced programme of teacher and school leadership development opportunities.

Planning and delivering appropriate, relevant, and cost-effective professional development for teachers is always going to be demanding. The Budapest Agenda (op.cit) sets

out a comprehensive list of requirements and this could be seen as intimidating by some schools, particularly those who are new to enterprise education. It can be argued that there is a logic to structuring professional development requirements in a way that fits with an entrepreneurial development cycle. Trainees need to develop their vision for enterprise education before they can plan their provision, decide on delivery strategies, and undertake assessment and evaluation of the learning outcomes. The sequencing of these topic areas is a deliberate attempt to replicate the same cycle of learning that the school students will be experiencing. The starting point must be in the trainees/students own experience. Both sets of learners need to examine their own preconceptions and prejudices about enterprise.

One way to do this might be to provide a 'Challenging the Myths about Enterprise' session which would allow for the exploration of definitions and serve as an ideal launch point for starting to build an institutional enterprise education vision statement. It can also serve as an audit, as mentioned earlier, allowing schools to avoid duplication through mapping of their existing professional development provision. Health and Safety issues may already be covered as a generic topic and the need is only to fine tune the content to ensure it is appropriate for their enterprise education programmes. Other areas may require more bespoke inputs from expert providers but the central theme remains, that of school improvement.

Teachers come into the profession because they want to help students develop their full potential. As an initiative, enterprise education starts with a huge advantage in that it aims to empower students to take responsibility, not just for their learning but for their future. Evidence suggests that it can have an equally powerful impact on teacher development. Evaluations of enterprise education professional development programmes which report that practitioners have had a positive training experience tend to exhibit similar characteristics. Invariably the event has been planned with practitioner input and reflected the reality and the demands of teacher/lecturer workloads whilst also providing a balance of challenge and support.

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Chapter 3.2

Enhancing green entrepreneurship education and skills in the context of Latvia

Abstract:

This article contains the results of scientific literature review, which is significantly important for giving insight into entrepreneurship education, green entrepreneurship education and green entrepreneurial mind-set development in general education. The entrepreneurial competence is analysed from different viewpoints stressing the topicalities related to sustainable and green education and offering the theoretical model of green entrepreneurial mind-set developed by the authors of this chapter based on the findings of Kouakou et al. (2019) and Uvarova et al. (2021).

Given the importance of entrepreneurship as a key driving force of economic growth, the entrepreneurship education is emphasized for developing the learners' skills, competencies, beliefs and thought patterns, highlighting sustainable values, environmentally friendly and supportive thinking, and behaviour, as well as describing the examples of good practice in the Latvian education space.

The aim of the chapter is to promote understanding of the development of entrepreneurial competences in general education. The content of the chapter is relevant to teachers, students and others interested in green entrepreneurial mind-set development.

The outcomes to be achieved after studying this chapter – the reader will be able to:

1. be aware of the essence of green entrepreneurship education and green entrepreneurial mind-set development in general education;
2. analyse entrepreneurial competences from different viewpoints;
3. describe approaches to entrepreneurship education.

Keywords: entrepreneurship education, entrepreneurial competence, green entrepreneurship education, green entrepreneurial mind-set

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Chapter Structure:

- 1 Introduction
2. Entrepreneurship education and entrepreneurial competence
3. Green entrepreneurship education
4. Involving students in eco-/green entrepreneurship development activities in Latvia
5. References

1 Introduction

The 21st century is a time of rapid changes when the question of innovations and entrepreneurial competencies becomes more and more relevant helping to find new creative solutions to the existing problems and address the demanding challenges. These new ways of thinking, working, and solving problems call for excellence in innovations and entrepreneurship, as well as require proactive agents of change in private, public, and non-profit sectors by supporting and facilitating development at all levels of society (Karlsson *et al*, 2021).

Also the documents developed by international organizations, such as 'The Sustainable Development Goals Report' (2019) and 'European Skills Agenda for sustainable competitiveness, social fairness and resilience' (2020), support the implementation of sustainability goals and emphasize the need for entrepreneurs to introduce sustainable and environment-friendly values in their activities. OECD Skills Strategy Latvia (OECD, 2019), explaining the rapid technological and other changes in the global processes, highlights that it is necessary for Latvia's inhabitants to develop and strengthen skills, which allow them to adapt in rapid change and innovation processes. Every day there is a need to perform new tasks, look upon problems from new perspectives, use resources in new combinations, as well as look for new solutions.

Green entrepreneurship is one of the areas that currently requires rapid changes and development of new business models, where not only new professional knowledge, skills and competences are needed, but also ability to use them on the daily basis. This context of different complex challenges and problems require diversity of perspectives, ideas and skills to ensure that all kinds of resources and human capabilities are used in a way where multiple interaction takes place to bring together different types and levels of knowledge, skills, and competencies (Karlsson *et al*, 2021; OECD, 2019).

Along with social development trends and scientific research studies in the field of education, also in Latvian educational space the effective solutions are constantly being sought for quality education. Civic participation and activity, responsibility for the sustainable development of the local community and the world characterize modern education and competencies that must be acquired when implementing education according to contemporary requirements.

In Latvia, the project '*Kompetenču pieeja mācību saturā*' is implemented since 2017; the main objective of this project is to employ a modern competence-based education in every school of Latvia paying attention to the development of transversal skills (also referred to as transferable skills). Transversal skills, such as creativity, self-directed learning, critical thinking, and problem solving, collaboration, civic participation, and

digital literacy include important cognitive, affective, and social aspects of student's activity that concern all areas of human activity. These skills help to acquire knowledge in different contexts through various ways of thinking and self-directed learning, thus, strengthening the link between new knowledge and personal experience. Moreover, the use of transversal skills in different areas of learning strengthens the students' ability to use their skills independently and in a wide variety of situations, including complex and unpredictable ones (*Kompetenču pieeja mācību saturā*, 2017; Olina, 2019).

Transversal skill groups include not only skills, but also certain personality traits and attitudes that can be gradually developed into habits. These are, for example, the receptivity and perseverance that are characteristic for innovation and entrepreneurial skills and competence, where innovation is the process of creating new ideas that are useful for a person and people, but entrepreneurial skills allow to implement these ideas into practice, thus achieving one's own goals and the goals of society (*Kompetenču pieeja mācību saturā*, 2017; Olina, 2019; Garcia-Lopez, 2017).

2 Entrepreneurship education and entrepreneurial competence

One of the means for sustainability in the labour market and living in today's conditions is the development of entrepreneurial skills, which has become an important and topical issue worldwide. Entrepreneurship education offers solutions, and its task is to develop young entrepreneurs who are open to change, do not shy away from problems and are ready to tackle them creatively, based on the knowledge and skills acquired through lifelong learning. Entrepreneurship education not only influences the way young people think, but also helps them to acquire the skills, knowledge and attitudes that are essential for developing an entrepreneurial culture (Entrepreneurship Education at School in Europe, 2016).

The implementation of entrepreneurship education actualizes a new perspective on the development of educational content, intending to include in it the aspects of entrepreneurial competence development and career education. Such perspective requires a complex approach to the organization of the learning process, focusing on personality development and provision of self-realization opportunities, as well as purposeful management of entrepreneurship education (Riemere, 2013).

According to Bikse (2012), entrepreneurship education includes four key aspects:

1. In its broader sense, entrepreneurship education focuses on the development of a set of personal attributes and skills that are important in any field of activity and life, without directly linking it to the development of new businesses.

2. The development of entrepreneurial competences is implemented at each level of education, ensuring the development of specific business skills and the acquisition of knowledge on how to start and successfully develop entrepreneurial ventures.
3. A constant motivating of young people for realizing that self-employment and entrepreneurship could become their next career choice.
4. Entrepreneurial competences must be developed from an early age to foster the forming of professional interests in order to promote a well-informed and -reflected choice of profession (Bikse, 2011, 32).

Thus, the entrepreneurship education (Entrepreneurship Education at School in Europe, 2016; Oganisjana, 2015, 2013) can be seen as a complex set of activities appropriate for all levels of education and all disciplines, including teacher education, curriculum development and approaches to learning, with the interaction of all stakeholders – educational policy makers, educational boards, school administrations, educators, pupils, parents, support staff and surrounding community. The term ‘entrepreneurship education’ is often understood too narrowly as acquisition of business skills and knowledge in business, management and economics. However, development of entrepreneurial skills and competences is important not only for those who intend to link their professional lives to economics and management skills.

Entrepreneurship education aims to foster creativity, innovation, and self-employment (Lund, 2014). Nowadays, everybody benefits from creativity and problem-solving initiatives both in their daily lives and professional careers. Therefore, it is important that entrepreneurship education focuses on the development of skills that are important in all fields of human activity, as well as on the development of specific basic business skills and knowledge, following the principle – “learning by doing” (Entrepreneurship Education at School in Europe, 2016; Riemere, 2013).

The recommendations of the European Parliament and Council on key competences for lifelong learning emphasize the tendency to perceive entrepreneurship not only in economic context but much broader. It is related to an individual’s ability to implement his or her ideas, which requires a creative and innovative approach, risk-taking, as well as the ability to plan and manage activities to achieve the set of objectives by recognizing ethical values and promoting good governance (*Eiropas Parlamenta un Padomes ieteikums par pamatprasmēm mūžizglītībā*, 2006).

Based on the framework definition developed by the international task force on entrepreneurship education, the Eurydice report ‘Entrepreneurship Education at School in Europe [*Uzņēmējdarbības izglītība Eiropas skolās*]’ (2016) describes the objectives of

entrepreneurship education, including the development of the learners' skills and thinking to turn creative ideas into entrepreneurship.

Entrepreneurship education, in turn, promotes the development of entrepreneurial competences by acquiring knowledge, skills and experience (Bikse, Riemere, 2013). Starting from acquiring knowledge and continuing to skills improvement, entrepreneurship education promotes the development of general ability and improvement of professional abilities by facilitating entrepreneurial skills and promoting entrepreneurial behaviour in the entrepreneurship process. From observation to participation, the social learning network provides multi-level learning channels for students to continuously improve their skills in learning and practice (Garcia-Lopez, 2017).

In this context, it is important to understand the essence of the concepts *entrepreneurial skills* and *entrepreneurial competence*. *Entrepreneurial skills* relate to solving economic problems and creating new economic value, but *entrepreneurial competences* are a broader concept, which consists of personality traits, entrepreneurial knowledge, and skills, and is concerned with solving problems in the personal and social sphere and creating relevant new value for oneself and society. Both concepts, *entrepreneurial skills* and *entrepreneurial competence*, include the following interrelated components: personality traits, abilities, skills, learning, motivation, emotions, needs, cognition and activity (Garcia-Lopez, 2017; Oganisjana, 2015; Wei et al, 2019).

Entrepreneurship education is important throughout the whole lifelong learning process and in all learning disciplines, enabling innovative talents and applying innovation-driven development strategies. Nowadays, not only the acquisition of theoretical knowledge is essential but also the development of creativity, innovation, initiative, self-employment, and other life skills such as sustainable thinking, systemic analysis, change management, strategic and operational decision-making, formation of openness and trust, balancing the stakeholders' interests and achievement of compromise (Wesselink et al, 2015).

Getting acquainted with scientific research studies on aspects of entrepreneurial competences, it is clear that the tendency to improve skills and develop resources to enhance the innovation potential is predominant. Entrepreneurship education relates to acquisition of relevant knowledge and experience to improve entrepreneurial and creative skills that can be applied in practice, education and environments supporting innovations. Research shows the following interrelationship: the higher the subjective initiative of student entrepreneurs, the more obvious is the innovation (Wei et al, 2019).

Entrepreneurship opportunity recognition is emphasized as a particularly important dimension of entrepreneurial competences (Bacigalupo et al., 2016, Hu et al. 2019), which is described as interaction between individuals and their environments. It is the

core activity in the early stage of entrepreneurial skills development – the process of understanding and evaluating the market demand, and continuously processing further by applying the knowledge acquired during entrepreneurship education process that supports their innovative ability and personality. Kouakou et al. (2019) have identified six other keywords that characterize the entrepreneurial competence – risk taking, innovation skills, business profit, value creation, initiative taking, and venture creation.

Garcia-Lopez (2017) agrees that entrepreneurship opportunity recognition dimension is a driving force that requires risk-taking and being creative and innovative. In addition, everyone should act with financial, moral, and social responsibility to implement a new business idea that can contribute to solving social problems (Garcia-Lopez, 2017).

Important entrepreneurial competence dimensions also include skills and behaviour, enhanced through entrepreneurship education that provides learners in all levels of education with informed knowledge and other necessary resources, thus creating an atmosphere of innovation and a good environment for innovation and development. This characterizes individuals as active contributors to the development, emphasizing the meaning of individual traits and environment (Wei et al., 2019; Bacigalupo et al., 2016).

As emphasized by Garcia-Lopez (2017), already in the primary school children can be educated to become entrepreneurs and make business decisions based on personal and social values. The disposition towards entrepreneurial mind-set develops gradually, starting during the child's basic education stage and strengthening at higher educational levels. Entrepreneurship education is important because it is recognized as a potentially effective means of promoting awareness of future opportunities for making a career, developing reasoning and problem-solving skills, transferring knowledge, and establishing the basis of entrepreneurial competence (Garcia-Lopez, 2017).

3 Green entrepreneurship education

The issues of sustainable and ecological education have been topical from the middle of the 20th century, including sustainability issues and concerns for the environment in the context of climate change and acquisition of related knowledge (Stokes, Edge, West, 2001). Consumers gradually change their environmental perception and encourage companies to look for and implement green business practices. Environmental values are becoming increasingly important in the whole of society. Global problems, the decrease of biodiversity as well as social tensions are systemic challenges in which education has a key role to play (Karlsson et al., 2021).

These developments have been viewed both as a challenge and as an opportunity for

public and private institutions, and the transition is gradually implemented towards socially responsible policies that ensure competitiveness. Scientific research shows the need to preserve the environment and natural resources, stressing the protection of nature and raising awareness of sustainable development, including also eco-entrepreneurship and social entrepreneurship.

Green entrepreneurship education is viewed as a tool for developing informed, responsible, and living-ecosystem-oriented citizens in the education system, resulting in the need to develop new skills to complement existing set of entrepreneurial competence (<https://www.zalabriviba.lv/>). Yet, the competencies for green transformation are poorly addressed, and the offered developmental strategies do not reach the goals of green transition as a holistic and integral competence (Mets et al., 2021).

The Council Conclusions of 20 May 2014 on promoting youth entrepreneurship to foster social inclusion of young people (2014) identify some key points for promoting youth entrepreneurial competence:

- development of an entrepreneurial mind-set and skills in school and through youth work activities, such as volunteering, acquisition of digital skills and cultural awareness;
- promotion of social entrepreneurship that includes sustainable and environmental values and contributes to social inclusion.

However, the scientific literature lacks the unity when defining the concept “green competences” and the offer of developmental strategies, which could reach the goals of green transition as a holistic and integral competence. These competencies are described as a multidimensional construct consisting of green knowledge, green skills, green abilities, green attitudes, green behaviours, and green awareness. In recent years, along with the research on green skills and competences, the emphasis is also placed on understanding of such concepts as green management of human resources, green employment places and green performance management (Cabral and Dhar, 2020; Mets et al., 2021).

As in general entrepreneurship is viewed as a driving force for growth, economic development and innovation, the changes take place also in Latvia towards green entrepreneurship, which requires entrepreneurs to change their approaches and consider environmental values due to the challenges related to environmental and climate change. Green entrepreneurial competence development is viewed in connection with the development of different transversal and specific skills, awareness of oneself and internal values and general emotional intelligence (OECD, 2019).

There are new demands on entrepreneurship education since the competitiveness of the economy and well-being of individuals are increasingly dependent on an educated

society living amidst environmental and social constraints. Therefore, in the field of education it is important to promote creativity and innovation abilities of pupils and students that can particularly help to promote sustainable and green entrepreneurship (Bikse et al., 2016).

Sustainability and ecological education go hand in hand with two essential aspects: one of them is the acquisition of knowledge and skills, the other one relates to the shift in the individual's value system and attitudes (Nevin, 2008). In this context, it is important to pay attention to the development of sustainability competencies:

1. systems-thinking competence linked to the ability to analyse, structure and manage complex systems across different domains;
2. anticipatory competence that includes the ability to collectively analyse and evaluate future issues related to sustainability problematics;
3. regulatory competence that foresees the ability to communicate accordingly and to follow sustainability principles, values and goals;
4. strategic competence, which is linked to the ability to design and implement interventions as well as to anticipate the direction of sustainability change;
5. interpersonal competence that promotes and motivates collaborative and participatory sustainability research and problem solving;
6. meta-competence that integrates and ensures meaningful use of all five competences (Evans, 2019).

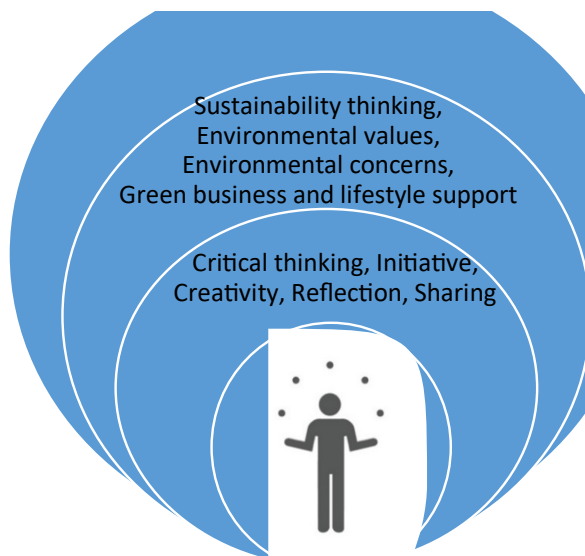
Thus, in the context of sustainable entrepreneurship, such entrepreneurial mind-set development becomes more and more important, which contributes to the entrepreneurial success and includes environmental concerns and related knowledge and skills like sustainability thinking, systemic analyse, initiating and managing processes of change, strategic and operational decision-making, building openness and trust. The concept of entrepreneurial mind-set is based on the cognitive processes – how people perceive, connect and process information. In turn, the most important entrepreneurial mind-set aspects are lifelong learning and openness for change and engagement in a complex and uncertain world (Kouakou *et al*, 2019).

Based on scientific research findings (Kouakou *et al*, 2019; Uvarova *et al*, 2021), the authors of this chapter offer the dimensions of green entrepreneurial mind-set (see Table 1).

Table 1. Dimensions of green entrepreneurial mind-set

Dimensions	Characteristics
Critical thinking	Recognizing opportunities Belief and confidence in one’s own capacity and competency to be entrepreneurial A pursuit of goal-attainment through personal mastery and value-creation Strategic and operational decision making
Initiative	Taking the initiative and personal responsibility for actions Self-efficacy Desire, motivation, and intention to practice entrepreneurship and behave entrepreneurially
Creativity	Creative and innovative approaches to problem-solving Proactive approach A belief in one’s ability to influence and initiate changes Engagement to change
Reflection	Systems thinking Self-directed professional growth Quality assurance
Sharing	Lifelong learning and openness for change Engagement in a complex and uncertain world Embracing diversity and interdisciplinarity Sharing objectives and balancing interests

Table 1 serves as a basis for the Model of green entrepreneurial mind-set (see Picture 1), developed by the authors, emphasizing both the significance of entrepreneurial skills and the competence for developing green business ideas and implementing environmental values (Kouakou *et al*, 2019; Uvarova *et al*, 2021).



Picture 1. Model of green entrepreneurial mind-set

The model of green entrepreneurial mind-set is a multidimensional model as it includes both the skills related to the knowledge on entrepreneurship, sustainability, and ecology, and the environmentally friendly values, attitudes, and the system of beliefs. Moreover, developing such mind-set, not only knowledge and skills will be acquired, but also it will allow seeing the meaning and interest in green entrepreneurial competences and how it can be applied in life and professional activity (Wei *et al*, 2019).

It is important to be aware that green entrepreneurial mind-set model provides several stages for raising awareness and changing attitudes, values, and behaviours, which corresponds with the research findings of Garcia-Lopez (2017) and Dweck (2006) on the growth mind-set, which underpins the notion that anyone can change and evolve to succeed, as well as that the green values can become transversal and integral values in all areas of human life:

1. Awareness of the essence of the entrepreneurial competence and understanding business environment;
2. Changes in attitudes towards entrepreneurial thinking and behaviour;
3. Development of empathy towards green business values;
4. Change of behaviour for creating green and environmentally friendly business ideas;
5. Implementation of new green business ideas and expansion of green business (Uvarova *et al*, 2021).

The green entrepreneurship education becomes an important way for acquiring resources, enhance innovative ability and develop creative and innovative personality. Therefore, the green entrepreneurship education approaches that the teachers can use in their work are particularly important.

4 Involving students in eco-/green entrepreneurship development activities in Latvia

Given the importance of entrepreneurship as a key driver of economic growth, entrepreneurship education is important for developing skills, competences, beliefs and thinking, as well as emphasizing sustainable values, environmental-friendly thinking, and supportive behaviour.

The European University Association (EUA) points out that sustainability issues are no longer separable from educational institution's strategy, and they should be embedded not only in the curricula but also in the institution's core values and policies. In addition, the EUA suggests that the sustainability issues can no longer be considered as sep-

arate and specific, therefore they must be included in all curricula, learning modules, non-formal and informal learning activities. By incorporating sustainability principles into its day-to-day work, an educational institution can build a shared value system for students and staff members towards greener values and green awareness (Learning and teaching paper # 14, 2021).

Teaching entrepreneurial skills to develop entrepreneurial competence is a dynamic process of changing cognitive mechanisms in terms of beliefs, values, and attitudes. This process comprises several stages and can be characterized as a co-learning between teachers and students, where at first there is a need to understand the essence of entrepreneurship, then experience the entrepreneurial process itself, and finally learn the entrepreneurial skills by recognising and exploiting business opportunities (Garcia-Lopez, 2017).

This approach allows students to apply the entrepreneurial role, practice entrepreneurial skills, analyse situations creatively and probe hidden aspects of the entrepreneurship process. It must be emphasized that entrepreneurship education curriculum must encompass also cultural diversity issues, values, as well as social and business interests.

In the non-governmental sector of Latvia, there are several environmental protection organizations whose activities include environmental education for sustainable development and entrepreneurship skills development activities, such as Eco-School Programme, Latvian Green Dot School (<https://www.zalais.lv/en/to-a-greener-latvia>), Mother Nature (<https://www.mammadaba.lv/>), the Association of Environmental Educators, Green Freedom etc. <https://www.zalabriviba.lv/greenliberty/https://ekoskolas.lv/>).

The Eco-School curriculum is a comprehensive, open, and democratic environmental education model that promotes an understanding about the environment in relation to different fields of study, strengthens transversal skills, develops attitudes, values, and interest, and also a willingness to act. The Eco-School programme envisages activities not only for those involved in the school life, but also for the surrounding society, thus promoting the development of common environmental awareness and public responsibility. The Eco-School curriculum is based on a competency approach and is a way to help to achieve the learning outcomes defined in the curriculum and learning programmes and the goals of environmental protection and sustainable development.

This way, the education system continues developing, which emphasizes the formation of understanding about things and phenomena in the light of interconnections and the active participation of everyone maintaining position of active lifestyle, which raises awareness of the scientific foundations of nature and society, and skills and abilities to address the nature protection issues. As Laizane (2000) suggests, meaningful education includes the unity of the teaching and upbringing process. Attitudes towards the

environment can be described as an interaction with nature, which gives a lot to humanity, but society is accustomed only to take.

Entrepreneurship education creates new and creative ways of teaching and learning, developing entrepreneurial competencies and paying special attention to young people's opportunities to set up businesses that could be the goal for their professional career, for example, working in the Junior Achievement Latvia (JALatvia, n.d.) network, developing 'Start Up' ideas. It is essential to build a link between problem-based learning and businesses, real-world experience, and to integrate it into all areas of teaching and learning adapting it to all levels of education – from pre-school to higher education. 'All young people must have at least one practical experience in a company before completing compulsory education' (Uzņēmējdarbības izglītība – rokasgrāmata pedagogiem, 2014)

By participating in 'JA Latvia' activities, pupils acquire personal skills and abilities: entrepreneurial skills; creative thinking and problem-solving skills, communication, and presentation skills; trust and a positive attitude towards things and responsibilities; teamwork and management skills; negotiation and decision-making skills; goal setting and time management skills; risk management skills and skills to respond to changes.

When mastering 'JA Latvia' programme, students:

- learn to attract finances for one's own business, do market research, work together to create a business plan, open and run own business, develop one's own product or service, manage business finances, trade;
- play the game TITAN - market research and the opportunity to promote the development of one's own product, compete with other schools, countries in Latvian and European competitions (<https://store.epicgames.com/en-US/news/industries-of-titan-early-access-launch>);
- participate in Shadow Day to analyse and apply data, business communication skills, creativity, follow written instructions, formulate answers from personal experience, identify behaviour, interviewing skills, make oral and written statements, read various sources of information, role play, self-assessment, technical writing, collaborative work <https://enudiena.lv>/https://jalatvia.lv/enu_diena.

A. Advani, the head of the organization "Junior Achievement Worldwide" believes that "these young people will be able to solve the world's most difficult problems and will become tomorrow's leaders" (JALatvia, n.d.). Teachers play a significant role in the teaching and upbringing process. They are learning coordinators and generators of ideas, setting the direction of learning process and supporting students to achieve entrepreneurial learning outcomes – particular knowledge, skills and attitudes. In order to improve skills in organizing entrepreneurship-oriented training and entrepreneurship edu-

cation, the 'JA Latvia' programme provides professional development also for the teachers. Any general or vocational education teacher who has an interest and responsibility for the economic development and prosperity of Latvia can become an implementer of 'JA Latvia' programme in 'JA Latvia' member school (<https://jalatvia.lv/>; <https://jalatvia.lv/starptautiskie-projekti/cbewb-project>). The participating teacher is one of the most important factors in practical business education. The implementation of 'JA Latvia' programmes will succeed if the educators clearly understand their special role and responsibilities in order to achieve the desired result in the development and improvement of young people's entrepreneurial competencies (JALatvia, n.d.).

By perfecting the teaching methods offering students the opportunity to express their opinion, defend it and accept the opinions of others, the corporation '*Latvijas valsts meži*' (Latvian State Forests) in cooperation with the National Centre of Education has developed a methodological tool 'Bioeconomics in schools' for promoting pupils' entrepreneurship (<https://www.lvm.lv/sabiedribai/skolam//vidusskolai>; Bioekonomika skolās, n.d.).

In this material, the lessons are designed as problem simulations, inviting students to actively participate in solving them, developing collaboration, and improving leadership skills. It is a competency-based material, which provides young people with the opportunity to acquire knowledge from various resources in the learning process, evaluate the opportunities offered, and make choices. The material helps young people to change their thinking from an irresponsible to a responsible consumer, leading to a deeper understanding of the role of forest resources in the development of Latvia's economy (Bioekonomika skolās, n.d.).

The company 'Getlini EKO' (<https://www.getlini.lv/>; <https://www.getlini.lv/vides-izglitiba/>) has been an active participant in the field of environmental education for several years. The excursions are organized for introducing visitors with environment-friendly management and opportunities for sustainable development. Special efforts are made to educate children and young people by involving them in competitions and creative projects to show that many materials that are used on daily basis can have another creative lifespan, and this way everyone can significantly reduce the amount of waste that they generate every day. For example, because of competition, board games are developed from different second-hand materials, which usually get discarded and become waste. For initiatives and projects aimed for children and young people engaging them in a responsible and environmentally friendly lifestyle and for creatively reusing the resources, 'Getlini EKO' has acquired one of the most prestigious environment initiative awards in the world 'National Global Energy Award Latvia 2018'.

The Institute of Lifelong Learning and Culture 'Vitae' implements the programme 'Lead-

er in me' (<https://www.leaderinme.org/>) in general and higher education institutions of Latvia (*Līderis manī*, n.d.). It has been developed in partnership with professional educators and inspires pupils and students to choose the leadership and acquire the skills needed to succeed in the 21st century. The programme is based on personal, interpersonal, and organizational effectiveness principles and activities, emphasizing that every child and young person has strengths and the ability to take responsibility for their own future or to be a leader in their lives. The programme helps children and young people to become self-confident, take the initiative, set goals, and follow their fulfilment, complete their homework, prioritize their time, manage their emotions, be tactful towards others, express their opinions convincingly, resolve conflicts, find creative solutions, appreciate differences, and live a balanced life. In the process of implementing this programme, children and young people develop the skills and self-confidence needed to manage their lives both in and outside the school.

The programme “Leader in me” is based on seven effective human habits developed by Covey (2020). In the educational process the most important thing is to start with yourself (the first three habits), which means getting to know and understand oneself, build self-confidence, plan, and set goals, be able to assess and evaluate, make decisions, and take responsibility. The seven habits of highly effective people offer the ways how to adjust the character and attitudes towards the world to see the world in a positive paradigm:

1. Be proactive - take responsibility for your decisions and behaviour instead of blaming the world for your problems and not concern yourself with things you can't change or influence;
2. Begin with the end in mind – if you visualise an action and its desired consequences first, the more likely you are to have success. Be aware of the difference between being efficient and being effective;
3. Put first things first – prioritise the things that are most important and categorize tasks;
4. Think ‘win-win’ – try to approach every situation willing to negotiate until both parties are satisfied as relationships can be compared to ‘emotional bank accounts’;
5. Seek first to understand, then to be understood – listen emphatically to others and get inside their frame of reference to understand them intellectually and emotionally. Only then will people start to really trust your opinions and advice;
6. Synergise - when people work together using everyone's strengths, it is always better than fighting each other and trying to go it alone. For this you need to understand, trust and respect each other;

7. Sharpen the saw if you want to keep sawing – take care of yourself, give yourself time to recharge, stay physically fit, and maintain your emotional, social, and mental wellbeing (Covey, 2020).

In turn, Clarke (n.d.) believes that educators may have difficulty providing students with the skills or knowledge that they require to establish, promote, and manage their own businesses in the future. The belief is rooted in the fact that most teachers followed a very traditional career path from school to college, university, post graduate study into their jobs. Because of this, it can be quite a challenge for teachers to guide students in becoming an entrepreneur and establishing their own businesses. However, building on Clarke (n.d.), examples for strategies and activities that promote entrepreneurial talent in school:

1. Entrepreneurial fundraising is not just about raising the maximum amount of money – when organising events in schools, encourage students take the lead and decide on the activity. No matter how much they make – they will learn from the experience.
2. Don't feel overwhelmed by big global issues: Look on your doorstep – start with the issues in school or local community and not with global issues. Ask students to identify problems they see in the local area and ask them to consider innovative ways in which these could be addressed. Thus, enterprising idea could end up having a positive impact on thousands of local people.
3. Take a risk – challenge students to find their own answers and encourage students to carry out their own independent research, or how to learn from trial and error.
4. Promote STEM skills across all subjects.
5. Mix it up - encourage cross-curricular collaboration, bringing several different subject areas together to develop a project or to set a challenge.
6. Encourage oracy - develop communication skills in a safe and supportive environment, whether it is by presenting ideas to peers, taking part in interviews or speed networking events.
7. Connect with local businesses – one of the best ways to promote entrepreneurialism is to introduce your students to local entrepreneurs and small business owners.
8. Encourage creativity and do not forget a digital world - encourage blogging, memes, viral posts, and hashtags into enterprise projects.
9. It's ok if it all goes wrong – school-based enterprise is about encouraging students to take a risk, try something new, put their ideas into action and develop the key skills that will make them successful in life in a safe, supportive, and nurturing environment.

Thus, the results suggest that entrepreneurship education and the education system have a general and essential role in addressing the issues of green entrepreneurial competence and management and develop a green entrepreneurial mind-set. Different level educational establishments are important resources for promoting sustainable development and raising awareness of the challenges created by modern globalization, including also climate change and environmental problem issues. It is important to integrate the environmental issues at all levels of education, already from an early stage. Also, there is a need to include environmental issues in curricula of all study programmes, in different subjects, in order to understand and help to develop values, beliefs, attitudes and behaviours that positively influence the surrounding environment.

Tasks for reflection and discussions:

1. Read one book (or story, article) or watch a movie that reflects topics related to entrepreneurship.
2. Read one book (or story, article) or watch a movie that reflects topics related to entrepreneurship education.
3. Interview a teacher and/or an entrepreneur and find out the most important aspects of entrepreneurial competences and approaches to entrepreneurship education.
4. Visit one institution related to green entrepreneurial mind-set or participate in one event related to green entrepreneurial mind-set.
5. Based on your observations, interviews and theoretical knowledge, develop a reflection of your entrepreneurial competences.

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Chapter 3.3

The entrepreneurial Competence: Face to Face and Virtual Learning Environments to Foster Entrepreneurship in the Post-Pandemic Age

Abstract:

Entrepreneurship and creativity can be defined from the perspective of competency-based training. Different taxonomies of competencies have been developed in which entrepreneurship and creativity occupy different positions (in some of them, creativity is a part of entrepreneurship; in others, both competencies are at the same level). The development of the entrepreneurial capacity of European citizens and organizations is one of the key policy objectives for the EU and the member states. The European Commission identified the sense of initiative and entrepreneurship as one of the 8 key competencies necessary for a knowledge-based society, redefined recently as “Entrepreneurship competence” (refers to the capacity to act upon opportunities and ideas and to transform them into values for others). The “Entrepreneurship competence” is founded upon creativity, critical thinking and problem solving, taking initiative and perseverance, and the ability to work collaboratively to plan and manage projects that are of cultural, social, or financial value. In this chapter, we review the state of art about entrepreneurship and creativity. The peculiarity of our proposal is to highlight the importance of learning environments for the development of creativity and entrepreneurial capacity.

Keywords: Competence-Based Training; Entrepreneurship; PLE; Creativity

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Structure of chapter

1. Introduction: What do pandemics teach us about innovation?
2. Can we define the Competence “Entrepreneurship”?
3. Are there different learning styles?
4. What are the core competencies that an entrepreneur needs to acquire?
 - 4.1. Can we describe the competence elements of entrepreneurship training?
5. Why should we differentiate about pre-formative and post-formative entrepreneurship?
6. What strategies can we use for teaching entrepreneurship?
7. Can we articulate some specific methodologies around the core competences of teaching?
8. Pre- and post-pandemic learning environments
9. Conclusion: competences, strategies, and learning environments
10. References

1 Introduction: What do pandemics teach us about innovation?

Although the number of references to SARS-CoV-2 has now decreased, if we enter the term “COVID-19” in Google Scholar, the system returns 757,000 entries, corresponding to articles, books, conference papers or web publications. But have we learned anything from this pandemic that devastated the world? And have the pandemics that preceded it taught us anything about innovation and entrepreneurship in human beings?

The pandemic leaves a huge impact on the generations that are suffering from it, but it also teaches us something about innovation and entrepreneurship. All living organisms, including humans, change generation by generation and their populations adapt with these small gradual changes to new environments.

A well-known example is the colour change of the Peppered Moth (*Biston betularia*) (Figure 1) when the Industrial Revolution covered the white bark of birch trees in Manchester and other English cities with black dust.

The pale wings of these moths became darker in a significant number of individuals, because, on blackened bark, these moths were easier prey for insectivorous birds. And this change occurred in only a few generations and could be well documented by butterfly collectors.



Figure 1. Coalbrookdale at night (left) 1801 by Philip James de Loutherbourg¹² and *Biston Betularia* (Peppered Moth) (right) pale and dark types, on a dark bark of the birch trees¹³.

These gradual changes brought about by the action of natural selection (Darwin, 1859) are difficult to observe in groups whose generations take many years. We need only

12. Public Domain.

13. “Lichte en zwarte versie van berkenspanner (*Biston betularia*)” by Martinowksy at Dutch Wikipedia is licensed under CC BY-SA 3.0.

think of the changes in the skulls of hominids - the closest relatives of human beings - over the last three million years. (Figure 2)

However, in living things where generations last fewer years, changes become evident in a shorter time. If we are talking about micro-organisms, then we can see their changes very quickly, as their life cycle can last thirty minutes. In this way, micro-organisms resistant to antibiotics have developed in a very few years, due to the widespread use of many antibiotics, which has selected those that had a natural resistance to this type of substances.

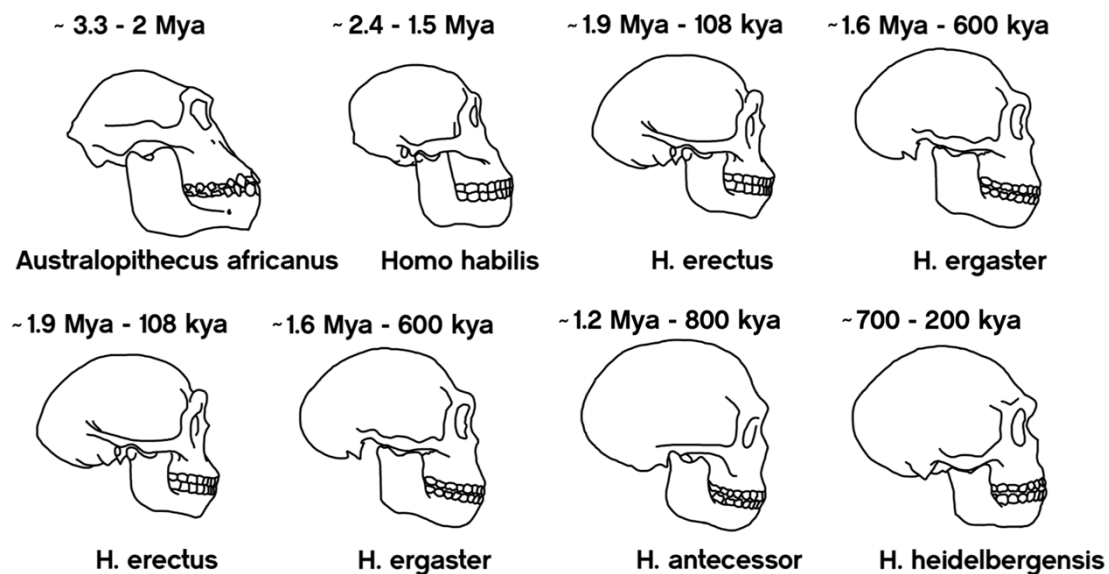


Figure 2. Evolution of the skull three million years ago¹⁴.

Thus, SARS-CoV-2, the virus causing COVID-19, with its rapid reproduction rate -18 / 20 hours- adapts very quickly to human geographical and social conditions, including those produced using drugs or vaccines, which has led since 2020 to the recognition of different variants (alpha, beta, gamma... omicron), of which only a few have developed sufficient virulence and prevalence to be of deep concern to health authorities. Genetic variations that are advantageous to individuals are favoured by natural selection and are passed on to subsequent generations.

In the same way, humans are subject to the process of natural selection and genetic variations that are more resistant to SARS-CoV-2 will be passed on in greater numbers to the next generation, as their carriers will survive longer and reproduce in greater numbers, although these changes will be much slower due to the greater longevity of humans.

14. "Skull evolution" by SimplisticReps is licensed under CC BY-SA 4.0.

However, in the case of humans, the high level of learning and social exchange means that entrepreneurship and creativity - which also have a genetic basis and are transmitted through generations - produce innovations that facilitate, for example, resistance to pandemics such as the current one, through social and cultural mechanisms, such as the creation, manufacture, distribution, and implementation of vaccines on a massive scale to the population.

Isolation, the use of masks - both of which were already common in epidemics or pandemics, as evidenced by preserved paintings and accounts of “plagues” such as the one that struck London and was recounted by Daniel Defoe in his 1664 work “A Journal of the Plague Year” -, collaboration between teams of researchers, health policy actions at global level and medical innovations - even risky ones - at national or regional level, are bringing the pandemic situation under control in a very short period of time.

We can therefore state that creativity, innovation and entrepreneurship are profoundly human characteristics, deeply rooted in our biology and displayed to improve all aspects of human life.

Thus, in times like the present, we can observe how human beings bring into play all their creative, innovative, and entrepreneurial capacity to develop countless “intersections” between disciplines and areas of knowledge (Johansson, 2017) that accelerate or facilitate adaptation to new circumstances.

Innovations have also become evident in relation to the impact of COVID-19 at the global level in the field of education, which has been highlighted by reports such as the various authors (Grek & Landri, 2021; Khalil et al., 2021; Mustafa, 2020; Schleicher, 2020; Reimers, 2022).

These first approaches to the educational impact of the pandemic show that many of the changes in the organisation of education systems and teaching methodologies have been accelerated by the pandemic and its effects (closure of schools, isolation of the population for varying lengths of time, etc.) and that a wide variety of organisational and methodological solutions have been adopted, most of them based on the replacement of face-to-face teaching with b-learning or e-learning models. It therefore seems important to reflect on some questions in relation to innovation, entrepreneurship and its teaching, and we will do so in this chapter specifically on two of them.

So, if anyone wonders what pandemics teach us, the answer is simple: they explain how human beings and their environment are changeable and how innovation - and entrepreneurship - have been established as adaptive human behaviours to cope successfully with these changes.

These are the issues we will discuss in this chapter:

1. First of all, we will try to define “entrepreneurship” as a competence, in order to situate the reader in our academic perspective.
2. We will also try to establish whether entrepreneurship is something very specific or whether there are different ways of being an entrepreneur, different “styles” of entrepreneurship. And, if so, what would be the characteristics that best define an “ideal” or “type” entrepreneur. In this way we will be able to address which methodologies may be most valuable for teaching the competences or skills of entrepreneurship in relation to the characteristics of future entrepreneurs.
3. Thirdly, It will be necessary to tackle the teaching of entrepreneurship - accepting that it is possible - and what competences need to be developed in the training of future entrepreneurs, especially in relation to the different stages of entrepreneurship (the start of an idea, its development as a project and its consolidation), which is very important because it will lead them to the idea of “entrepreneurial teams”.
4. Fourthly, we will describe general strategies that can be useful for teaching entrepreneurship. These can be put into practice in simulated reflection activities that we will propose.
5. Finally, we will take up the lessons of the pandemic regarding the use of physical and virtual spaces for entrepreneurial training, which is very interesting to understand how we will have to face in the immediate future the task of teaching our students - today or tomorrow - to develop innovations and to be entrepreneurs.
6. The usefulness of our manuscript is therefore based on the clarification of concepts such as innovation or entrepreneurship. All of this from a theoretical or general point of view, and with questions and proposals so that the reader can reflect on the contents of the chapter and apply them in small simulations or suggested cases.

2 Can we define the Competence “Entrepreneurship”?

The concept of “Entrepreneurship” is polysemic and has different perspectives, which are oriented towards business, education at all levels and, more recently, the so-called “social entrepreneurship” and its associated concepts (social innovation, collaborative economy, social enterprise, corporate social responsibility, corporate citizenship, circular economy, economy for the common welfare, solidarity economy or alternative economic practices) (Chaves Ávila & Monzón Campos, 2001; Saebi et al., 2019).

Thus, creating a company to produce craft beer is a classic case of entrepreneurship, but designing and carrying out a project to improve the employability of a vulnerable group of people - e.g. migrants displaced by war or social conflict - can also be considered

an entrepreneurial process; even educational innovation processes can be considered entrepreneurial processes, as they have similar characteristics and parallel processes. Therefore, as the reader moves through the chapter, he or she should bear this key issue in mind, as we are going to refer to entrepreneurship as a broad process, encompassing the entrepreneurial, the social and the educational. On the other hand, if we want to consider entrepreneurship as a “competence”, we should be able to clearly understand what we call “competence”.

Research and practice related to the concept of competence is often based on aspirations to achieve higher educational attainment and enhance entrepreneurial success through, in many cases, processes of innovation and entrepreneurship (Spencer & Spencer, 2008). Also, one of the key challenges emerging in the literature is the reconciliation of the different definitions and perspectives on the concept of “competence” (Ahmad & Hoffmann, 2007; Hayton & Kelley, 2006).

Since competent behaviour is the result of a variety of factors including an individual's motivation, personality traits, self-concept, knowledge or skill (C. Hunt & Meech, 1991; J. M. Hunt, 1997), not surprisingly, the boundaries and relationships between these terms are often blurred. Overall, there are at least two key meanings or uses of the term “competence” (Strebler et al., 1997):

- a) As behaviour that an individual demonstrates - Boyatzis defines it as an underlying characteristic of a person that results in effective action or superior performance in a task or job- (Boyatzis, 1991; Goleman & Boyatzis, 2017);
- b) and as a minimum standard of performance - a description of something that a person working in a particular area should be able to achieve. It is a description of an action, behaviour or result that a person should be able to demonstrate (Cheng et al., 2003, 2005).

Although the conceptual debate continues on what competition means, (*competence, competency, skills, etc.*) and what is meant by “entrepreneur” or “entrepreneurship” (*entrepreneur, entrepreneurship, entrepreneurial*) is not an obstacle in our case for the approach to entrepreneurship from a competence point of view (Gijón Puerta, 2017; Gijón Puerta & Ibáñez Cubillas, 2019). We will assume the concept of “entrepreneurial competences”, in the plural, as the set of elements that synergistically form a more general competence that we can call “entrepreneurship”.

However, while it is easy to recognise figures such as Steve Jobs or Bill Gates and give them the adjective “entrepreneur”, it is no longer so easy to establish the characteristics - skills or competencies - that give them this status.

3 Are there different learning styles?

Early researchers tried to understand entrepreneurs by seeking to identify the traits and characteristics of an entrepreneur. However, they had great difficulty in identifying such a set of traits and characteristics. Very few entrepreneurs possess all the traits and attributes presented in the literature. Especially because competences - even the most general ones such as communication skills, information management, creativity, etc. - are always measured in each context, which makes it difficult to generalise.

The response of authors such as Lessem y Schieffer (2016) has been to propose that there are several types of entrepreneurs, with different sets of traits, based on personality type (what might be termed as “entrepreneurial styles”). These styles can be related to multiple factors, which are categorised by the authors cited above on the basis of an extensive literature review:

1. Personal qualities such as outgoing personality, approachability, leadership, self-confidence, innovativeness, and risk-taking.
2. Personal background and business experience, history of innovation, production and marketing experience or entrepreneurial experience.
3. Intellectual skills, soft skills and management skills.
4. Behavioural characteristics such as having a broad perspective, spotting unique opportunities, having total commitment, visualising the need for control, having a utilitarian view of what is right, welcoming uncertainty, using contacts and connections, and embracing the vision of the competition.
5. Socio-economic factors, such as educational attainment, previous business experience, including family background in business and previous years working in any type of business.

4 What are the core competencies that an entrepreneur needs to acquire?

Part of business research has focused on the perspective that competencies, based on the conviction that entrepreneurship is ultimately carried out by individuals: enterprising people who start up or transform organisations and add value through the management of resources and opportunities (Bird, 1995), pointing out that these skills are necessary to launch a new business or project, but that highly effective entrepreneurs are those who survive and grow.

Entrepreneurial competencies have thus been identified as a specific set of competencies relevant to the exercise of successful entrepreneurship or social initiative in a

“human capital” framework (Colombo & Grilli, 2005; Nuthall, 2006). Thus, we can distinguish between “management skills” needed to grow the business or develop a project, and “entrepreneurial skills” (Chandler & Hanks, 1994; Lerner & Almor, 2002), needed to start a project or business, requiring the competence “entrepreneurship” competences in both areas (Man et al., 2002). Bird (1995) suggests that entrepreneurial competencies are underlying characteristics (specific knowledge, motives, traits, self-images, social roles and skills) that result in the birth, survival or growth of enterprises and projects.

Thus, the competence “entrepreneurship” could be defined as “the total ability of the entrepreneur to perform a job function successfully”(Man et al., op. cit.). The skills necessary for successful entrepreneurship over time may include, for example, oral presentation skills, interpersonal skills and the ability to prepare, organise and present a business plan (Ronstadt et al., 1988). A study conducted by Bartlett & Ghoshal (2002) identified three categories of competences: a) attitudes/traits; b) knowledge/experience; c) and skills/skills.

4.1 Can we describe the competence elements of entrepreneurship training?

Starting from the above-mentioned idea that there are different types of competences (entrepreneurial and managerial), we can now propose and categorise the elements that make up the competence “entrepreneurship”. Following Mitchelmore & Rowley (2010) they are presented in schematic form in Figure 3.

It is proposed that the reader should do an exercise, consisting on defining different entrepreneurial styles, taking one element of competence from each of the four clusters in Figure 3. In this way, it will become clearer how there can be different ways of developing entrepreneurial ideas.

For example, if we assume that an entrepreneur possesses competency elements such as “financial literacy”, (Entrepreneurial skill), “Management skills” (Business and management skills), “Leadership skills” (Competence in social relations) and “Decision-making skills” (Conceptual and interpersonal communication skills), We could define that person as someone capable of leading, managing and taking economic decisions in order to carry out a business project. We could call this style of entrepreneur “Managerial Entrepreneur”.

If you do several exercises of this type, you will see that we will intuitively recognise different types of people that we consider to be entrepreneurs, even if they do not have the same skills.

5 Why should we differentiate about pre-formative and post-formative entrepreneurship?

But perhaps one of the most important issues for the development of a sustained entrepreneurship over time, and which is not usually taken into account when it comes to training new entrepreneurs, is the necessary acquisition of skills for two different and successive stages: pre-training and post-training. Indeed, recent reviews on topics in entrepreneurship and related concepts such as social entrepreneurship or corporate social responsibility (Phillips et al., 2015; Pomaquero-Yuquilema et al., 2019; Saebi et al., 2019), address the entrepreneur's problem not only from the process of developing the entrepreneurial idea, but also beyond the creation of the company that derives from it.

Figure 3. Framework for the “entrepreneurship” competence

Competence (category)	Elements of competence
Entrepreneurial skills	<ul style="list-style-type: none"> Identification and definition of niches for innovation Development of suitable products or services Generation of ideas Prospecting the environment Recognition of opportunities Definition of strategies to take advantage of opportunities
Business and management skills	<ul style="list-style-type: none"> Development of long-term management systems Acquisition of necessary resources Operational skills for the business or project Financial literacy Management style Marketing skills Technical management skills Ability to implement development strategy Business plan preparation Skills in setting purposes Management skills
Competence in social relations	<ul style="list-style-type: none"> Sense of management of the culture of the organisation Ability to delegate Ability to motivate other individuals and groups Recruitment skills Human relations skills Leadership skills

Competence (category)	Elements of competence
Conceptual and interpersonal communication skills	Minimal business and project management skills
	Organisational skills
	Interpersonal skills
	Ability to manage “clients”
	Mental ability to coordinate activities
	Written communication skills
	Oral communication skills
	Decision-making skills
	Analytical skills
	Logical thinking skills
	Deal-making skills
	Commitment skills

Based on Mitchelmore & Rowley (2010)

The data on initial and sustained entrepreneurship at a global level clearly indicate that a large proportion of entrepreneurial ideas fail to consolidate as viable companies or projects. Although these data do not refer specifically to social entrepreneurship, it is possible to extrapolate the available data on the different elements that can influence this situation. Various reports, such as the *Global Entrepreneurship Monitor* (GEM) (Bosma et al., 2018; Hart et al., 2020), can serve as a reference to describe some of these key aspects of entrepreneurial activity in its initial stages (*Early-Stage Entrepreneurial Activity* -TEA-) and sustained business activity (*Established Business* -EB-), that we present below.

On the one hand, there is a difference between admiration for highly successful entrepreneurs and considering entrepreneurship (becoming an entrepreneur) as an attractive career. Globally, the attractiveness of the career is less than the admiration for successful entrepreneurs. And this is also related to the perception in each country of the ease of setting up and operating businesses. Some exceptions to this rule can be seen in countries such as Thailand, Turkey or the Netherlands, where the perception of entrepreneurship as a career outweighs the admiration for entrepreneurs, while the ease of setting up companies is very high.

On the other hand, self-perception of entrepreneurial capabilities and opportunities appears as a key factor in the levels of early-stage entrepreneurship. The high TEA rate could be explained by a high perception of opportunities (Thailand, Indonesia, United States, Canada, Chile, Colombia, Peru, etc.). However, when comparing this perception with the perception of one’s own entrepreneurial skills, some surprising data are found in GEM. Especially in Europe, there are countries (e.g. Sweden) that have high perceptions of opportunities and yet a much lower perception of one’s own capabilities for entrepreneurship; other countries (e.g. Spain) indicate a low perception of opportunities and at the same time a high perception of one’s own capabilities.

Finally, the relationship between BE and TEA, as well as the business discontinuity of new entrepreneurs, can give a clear idea of the fate of new entrepreneurial ideas in the medium and long term (BE is considered above three and a half years of business survival).

The reasons given in the GEM report are varied for entrepreneurial discontinuity, the most important being lack of profitability or capital (about half of the exits from the entrepreneurial system globally were for this reason). The report gives different reasons for the exit of entrepreneurs, and relates them to the geographical area concerned.

For example, the sale of companies or the search for new opportunities was described for very dynamic economies such as Canada or Taiwan but was also high in countries such as Morocco. Lack of profitability or financial problems largely affected companies in countries such as Turkey, Uruguay or Colombia (also the case in Spain). In some African and Middle Eastern countries, lack of capital or profitability was cited as a reason for exiting the enterprise system.

In order to try to understand the problem of the consolidation of companies and social projects associated with entrepreneurship, we can differentiate between the phases and levels in which entrepreneurship can be described. In this sense (Saebi et al., op. cit: 83) propose a model with three types of mechanisms spanning macro and micro levels of analysis: situational mechanisms, which link the effect of the macro-environment to individuals' purposes and beliefs; action-forming mechanisms, which link the effect of these purposes and beliefs on the actor's behaviour; and transformational mechanisms, which explain how the behaviour of these actors as a whole produces macro-level outcomes.

This model makes it possible to establish different challenges for entrepreneurship training:

- a) In the process prior to entrepreneurship, which would correspond fundamentally to entrepreneurial competences -pre-training-; pre-formation
- b) and in the subsequent process, for the development and consolidation of the entrepreneurial processes, which would correspond to managerial or administrative competences -post-training- post-formation. (figure 4).

We propose an activity for the reader to reflect on the entrepreneurial process shown in figure 4, in order to recognise the phases of an entrepreneurial process and the people involved in it. To do this, let us imagine the case of an entrepreneur who wants to start up a toy library to support families with few resources in a depressed area of a large city. The resources of a local public nursery school are to be used. It is suggested to the reader, based on the elements of competences set out in figure 3 and on the pre-formation and post-formation process included in figure 4:

Figure 4. Suggested reflection about pre and post-formation of Entrepreneurship

Pre-formation ----- ↓ Post-formation	ACTION / PROCESS	PARTICIPANTS	NECESSARY SKILLS	PERSONAL REFLECTIONS
	MACRO			
	Social Context			
	Institucional context			
	Social Outcomes			
	Institucional Outcomes			
MESO				
	Entrepreneurial team			
	Social Enterprise (misión, goals, tec.)			
	Results of the venture (scale, performance, etc.)			
MICRO				
	Social entrepreneur (Motivations, emotions, etc.)			
	Micro effects			
	Micro context			
	Micro effects (results)			

6 What strategies can we use for teaching entrepreneurship?

The pandemic has affected learning and teaching in formal systems globally (Khalil et al., 2021). A consequence of this has been the need to adapt to new teaching methods and the emergence of new ways of learning, essentially linked to the development of ICT and mobile devices. In this new scenario, teaching methods and learning environments must be considered a challenge for managers, teachers, and students. But these challenges must also consider that entrepreneurship is not only about generating business ideas or designing social projects, but that sustainability (the maintenance and consolidation of the project over time) are essential in entrepreneurship training.

One of the authors who has systematised these methodological changes in the field of higher education has been de Miguel (2005), who has focused on a series of methodologies for adaptation to the new context of higher education.

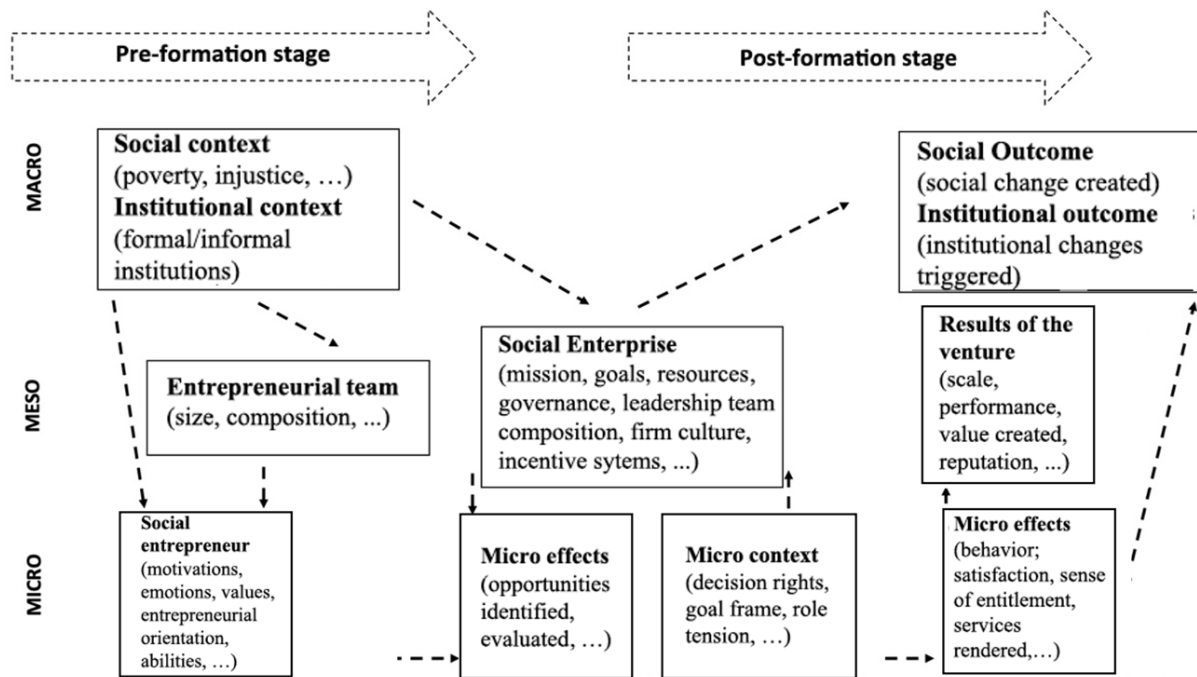


Figure 4. Levels and stages of possible research on social entrepreneurship and entrepreneurship training (modified from Saebi et al., 2019)

The European Higher Education Area (EHEA), involves moving from a teacher-centred model towards new forms of teacher-student and student-student interaction, but without abandoning more traditional methodologies. Gijón Puerta & Crisol Moya (2012) have analysed the changes involved in the leap from traditional teaching models to new methodological forms (see figure 5). These methodological changes can be used for teacher training in entrepreneurship education and can also be implemented at educational levels other than higher education.

Figure 5. Elements of change in methodology in line with EHEA

Traditional teaching	Teaching in the framework of EHEA
The teacher as the main source of knowledge	The teacher guides the use of information sources.
The student learns by «listening».	The student learns by «doing » and acquires skills for autonomous learning.
Students receive knowledge from the teacher and work individually.	Students work in cooperative groups and individually.
The assessment is unique and based on final exams.	Assessment is continuous and increases the importance of student production.
Examination marks are used for the selection of students.	Individual and collaborative student production, together with examinations, determine grades. Self-assessment becomes more important.

Traditional teaching	Teaching in the framework of <i>EHEA</i>
Tutories have a bureaucratic function.	Tutoring takes on an academic and vocational guidance function.
Teachers have little involvement in teacher action plans.	Teachers participate in the teaching teams.

Modified by Gijón Puerta & Crisol Moya (2012)

7 Can we articulate some specific methodologies around the core competences of teaching?

While it is true that entrepreneurship has a biological basis that inevitably defines innate creative and innovative capacities, as an expression of the genetics of each individual, the very high level of brain development in human beings and their existence totally linked to the social group to which they belong (family, group of friends, etc.) makes it essential to consider the modulation of innate capacities by education and socialisation in its full extent (informal, non-formal and formal).

Therefore, from our perspective and within a competency-based training model, it is essential to define and organise these “new” and “old” methodologies for the promotion of entrepreneurship, both in the pre- and post-training phases. And for this purpose, we take up the three broad categories of key competences defined by the DeSeCo group for lifelong learning (Rychen & Salganik, 2002), that will enable trainees to take a more active and creative role in their training process and thus to develop entrepreneurial actions more easily.

Acting autonomously

One requirement for students who wish to become more entrepreneurial is undoubtedly to be more autonomous in their learning process. In this sense, two methodological strategies can be put into play are:

1. *Autonomous learning*, through specific guides for autonomous learning, individual readings or group discussions, accessing the large amount of resources available on telematic networks.
The student becomes a producer of new knowledge (works, videos, audios, multimedia, etc.) and the role of the teacher becomes that of a guide for the student, elaborating rubrics for self-assessment.
2. *Metacognition*, through training in techniques for the improvement of learning and the development of learning to learn skills (from classical study techniques - underlining, speed reading, etc. to breathing and relaxation techniques, techniques for productive time management, etc.).

Using interactive tools

In this category, we can find various methodological applications that can favour creativity, entrepreneurship and innovation, among which we highlight:

1. *Problem- or project-based learning (PLB)* which, linked to individual and group autonomous work, allows the student to access the challenges associated with problem solving, in many cases through project design or the manufacture or creation of specific products.
2. *Virtual activities*, through the development of Personal Learning Environments (PLE) to which both students and teachers must adapt.
3. *Use of ICT*, taking advantage of the massive access to information that is possible today. For the student, already a native ICT user, it is basically a matter of adapting what he or she already uses in everyday life.

Interacting in highly heterogeneous groups

The increasing diversity of students (access competence levels, learning styles, career motivation, etc.) is an unquestionable fact. In this context, we can highlight some strategies that can help in the development of entrepreneurial skills:

1. *The detection of students' previous ideas and conceptual errors*, with which the teacher begins the lessons in which new topics are introduced (the use of concept mapping by Novak (Novak, 1990; Novak & Cañas, 2006).
2. *Cooperative work*, which allows for the introduction of problem-solving methodologies.
3. *The dialogic master class*, which appears as a renewed strategy for work in this context, and which implies for the student the challenge of participating in the development of the theoretical sessions, answering questions, consulting doubts, contributing ideas.

8 Pre- and post-pandemic learning environments

In relation to methodological changes, such as those described above, universities will have to address in the next decade the revision of learning environments, which can be analysed as key elements for defining teaching and organisational innovation processes. The ideas of personalised learning environments and the physical campus are handled together in a b-learning model, which will include both the physical presence of the student and the teacher on the campus and the use of virtual media.

Although it is risky to predict the future scenarios in which university lecturers will move in the coming years or decades, it seems reasonable to think that their role in under-

graduate and postgraduate courses will move towards an increasing virtualisation of teaching, with an increase in the autonomy of the student's work and a role increasingly oriented towards the guidance and advice of the student by the lecturer. B-learning-based teaching models, with less weight of classroom presence for both students and teachers, as well as the use of mobile devices connected to networks in institutional contexts (corridors, libraries, canteens, large spaces designed for collaborative work and relaxation, etc.) or outside them, seem destined to prevail over the more traditional face-to-face classroom environments.

On the one hand, this requires a renewal of infrastructures on the part of institutions and of methodology on the part of teachers and students. On the other hand, some authors also raise the danger of a new social division: that of students who can afford to attend highly specialised higher education institutions and that of those who will follow virtual studies, much cheaper and massified, where they will not have the possibility of personal contact with the teacher.

Given that this discussion has arisen in universities such as Harvard, with the adoption of the flipped classroom and the creation of completely virtual environments in many public universities in America and other countries, we will have as teachers to reflect on our future role and our contributions to students, both in personal dialogical contact and in the way we relate to them through virtual environments, in order to give the best of ourselves in all cases, and to demand the best of them as well.

It does not seem that all students can develop interactive teaching through networks, in which the role of the teacher is reduced to recording videos, suggesting the reading of documents and the telematic correction of activities and the sporadic carrying out of chats or video chats, from a purely e-learning perspective. In the literature consulted, the dichotomy between the education of research elites (with a greater presence in the classroom) and that of the masses of students (with a high or total virtualisation) appears recurrently.

Physical space

The functions given or the way in which physical space is used will undoubtedly facilitate or hinder the development of teaching methods, based on the evidence that physical space and architectural elements affect the human mind (Dance, 2017) and modulate learning (Portero Tresserra & Campos Calvo-Sotelo, 2018).

Despite the complexity of the system under study, and the difficulty of relating the well-being and comfort variables caused by educational spaces and their relationship with learning (Papale et al., 2016), psychology and neuroscience (with the precautions

that must be taken with this term) are working to establish the relationships between work and study spaces and the improvement of learning.

One of these lines of research addresses the possible benefits of a natural-like environment (vegetation, sound of water, presence of fauna, etc.) to promote well-being and also the improvement of learning processes through multisensory architectural models, designed to favour innovation, which some authors have called “biophilic design” (Abdelaal & Soebarto, 2018), by connecting it with the concept of “biophilia” developed by Edward O. Wilson¹⁵ (Wilson, 2021) (Figure 6), which have also been used in recent years in the development of new architectural models (Campos, 2014; Downton et al., 2017).

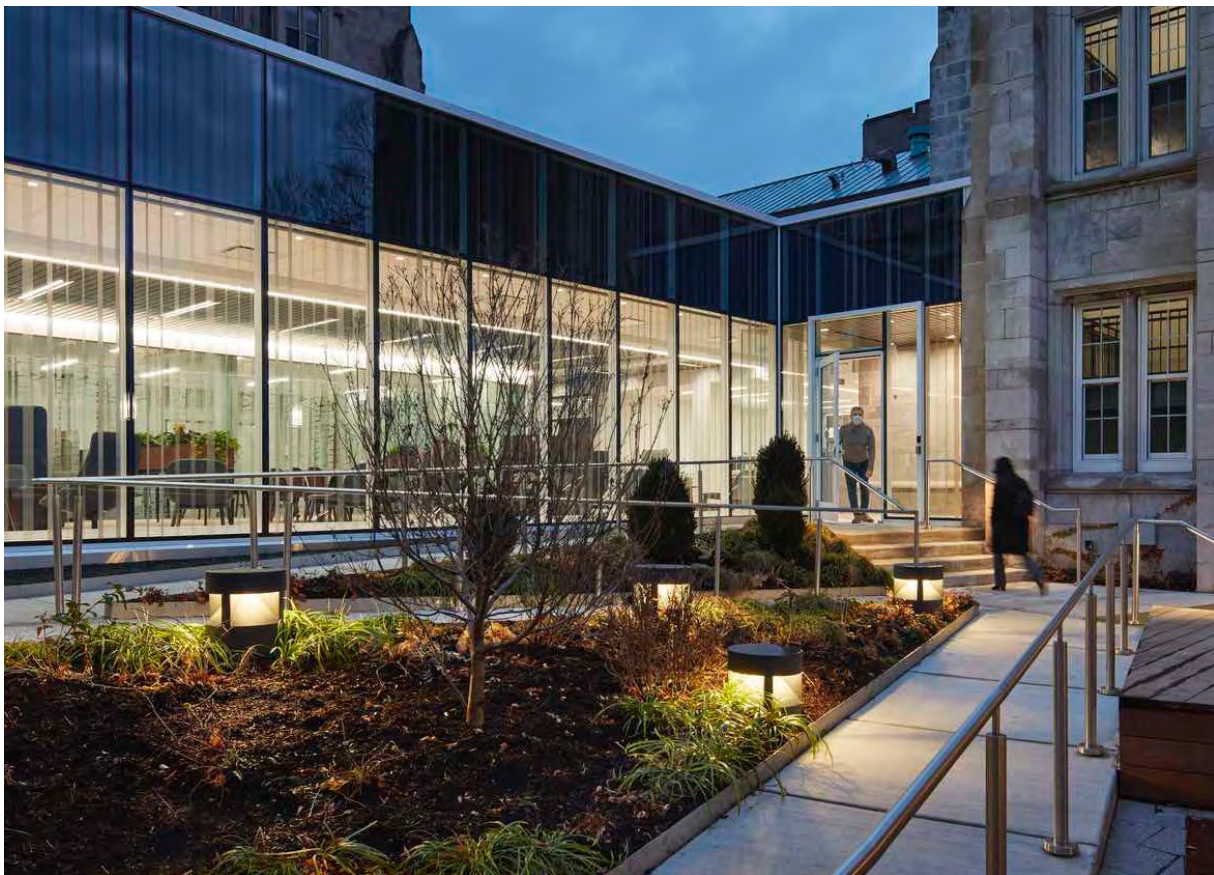


Figure 6. Biophilic design: University of Chicago Student Wellness Centre, USA¹⁶

Another of the current lines in physical spaces for learning is the creation of study and learning spaces outside the classroom, spacious, without walls and with WiFi connection, often linked to catering, where students or students together with their teachers can share moments of learning, at the same time as sharing breakfast, lunch or snacks.

15. We use the term Biophilia in the conceptual development of E.O. Wilson, although the first time this term is used, it is in the concept of Psychoanalysis by Erich Fromm, in contrast to the term necrophilia (in connection with his studies on freedom, aggression and the destructive instinct).

16. Hperlink to the website: <https://biofilico.com/news/best-examples-biophilic-design-education-students>

Wide corridors, multi-purpose rooms or cafeterias are spaces that universities are converting for this type of new space. (Campos, 2011). Examples of universities that have built or fitted out spaces of this type include the Net-Café at the University of Porto (Figure 7), the Hall-café at the University of Wisconsin-Madison, or the Tiered-Hall at the Fontys campus library at the University of Eindhoven (Figure 8).



Figure 7. E-learning cafes at University of Porto (Portugal)¹⁷



Figure 8. Fontys campus library at the University of Eindhoven¹⁸

Finally, reducing student stress, especially in the run-up to exams, appears to be a new challenge for higher education, which is being addressed, along with other measures (use of dogs and other animals on campus, etc.), the adaptation of spaces for relaxation

17. Hperlink to the website: <https://www.up.pt/portal/en/study/study-support/e-learning-cafes/>

18. Hperlink to the website: <https://www.mecanoo.nl/Projects/project/150/Fontys-University-of-Applied-Sciences-R3-Building>

or meditation has been the choice of universities, such as the Ibero-American University, which has designed a meditation room on its campus in Mexico City (Figure 10), or the University of Granada, which has created relaxation rooms called “Agora” (Figure 9).



Figure 9. Agora at the University of Granada (Spain). Rest space.

Although progress has been made in the creation of physical spaces in line with these new trends, in accordance with the recommendations for adaptation to the EHEA (Campos, 2014), which can be extrapolated to other educational levels, traditional classrooms continue to be the basis of their architecture, which can be explained for various reasons: making the most of spaces already built, the cost of adapting these spaces, the high number of students enrolled, etc.



Figure 10. Meditation House. Ibero University (Mexico City)¹⁹

Therefore, the traditional classrooms, equipped with multimedia for the development of the subjects, and with the possibility of organising the furniture for different types of individual and small group activities, constitute the learning space in general, together with the libraries, computer rooms, workshop classrooms and laboratories, or the spaces for conferences and activities for a large number of attendees (lecture halls, assembly halls, etc.).

The virtual space

Virtual learning environments in higher education have become widespread, based on different concepts that have created their own field of study and provoked a change in didactic action. New ways of accessing information have emerged, and with it, other perspectives on teaching and learning processes, since, through the ubiquity of digital devices, access to an infinite repository of knowledge has changed the way in which information is searched, stored and shared.

Likewise, new forms of communication also generate new forms of interaction between individuals, and above all new forms of social and cultural organisation within complete-

19. More information at <https://egresados.ibero.mx/casameditacion/>

ly virtual or semi-presential contexts. In recent years there has been an increase in the availability of open educational resources (OER) in higher education institutions.

The concept of PLE appears as an important element to favour autonomous and learner-centred learning, overcoming the existing limitations of Learning Management Systems (LMS) that host Virtual Learning Environments (VLEs) (Gallego Arrufat, 2016).

In the theoretical discourse on PLE, two main perspectives are identified. On the one hand, there is the technological and technical vision that emphasises the tools and applications that the individual considers for the creation of the PLE. On the other hand, the other vision refers to the pedagogical part, and is beginning to be introduced within formal education as a support to the teaching and learning process (Martínez & Sanmamed, 2017).

They are therefore a group of people who share an issue, a passion, a need, a problem, an aspiration or a focus for something they do or learn, this action is done with the purpose of improving from their constant interaction, reflecting, exploring ideas and probing for new answers (Wenger, 2001).

9 Conclusion: competences, strategies, and learning environments

Teacher training for teaching entrepreneurship, with the differences that may exist for the different educational levels, can be organised around the competences described, the strategies proposed and the learning environments available, always bearing in mind the two phases of entrepreneurship (pre-training and post-training) that define firstly the generation of the idea and the business or social project, as well as its implementation, and secondly the continuity and sustainability over time of the company, the project or the underlying innovation.

Figure 11 shows a summary table of the areas, methodological strategies, learning environments and types of learning.

Figure 11. Competencies, methodological strategies and learning environments

Area of competence DeSeCo	Strategies	Environment	Standard activities
Acting autonomously	Autonomous learning	Classroom Work outside the classroom Work through PLE	Autonomous learning guides Individual readings Group discussions, face-to-face or via platforms Material production
	Metacognition (Learning to learn)	Classroom	Study Techniques Techniques for the improvement of learning
Using new interactive tools	Problem or Project based learning	Classroom Work through PLE	Autonomous individual or group work Project design
	Virtual activities	Work through PLE Classroom	Flipped Classroom
Interacting in highly heterogeneous groups	Detection of preconceptions and conceptual errors	Classroom	Concept maps
	Cooperative work		Problem based learning
	Master class	Classroom Work through PLE	Dialogic class

We can therefore conclude that, to the extent that schools and teachers define the necessary competences for entrepreneurship and its teaching, and adequately combine methodological strategies and learning environments, it will be possible, to a greater or lesser extent, to train for entrepreneurship and its teaching.

But this cannot mean a break with so-called “traditional” methods or with teaching styles based on them. Nor can it mean the elimination or abandonment of classroom-based learning environments, the construction and maintenance of which have been very expensive for education systems. The use and combination of resources and methodological strategies should be the basis for a better teaching of entrepreneurship, as they are for a good development of the pre- and post-training stages of entrepreneurship.

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Chapter 3.4

The Effects of Creative Student Education on Entrepreneurship and Economic Sustainability in Economics and Management Sciences

Abstract:

There is a tendency towards creativity, innovation and entrepreneurship in economics and management sciences education and knowledge-based activities. Entrepreneurship education, in which entrepreneurial skills and abilities are gained through creative education, is generally given in the education programs of the faculty of economics and management sciences. At Sakarya University, courses related to entrepreneurship are given in the undergraduate curriculum of the departments of the faculty of business and political sciences, which provide education in economics and management sciences. This report examines the effects of raising creative students in economics and management sciences on entrepreneurship and economic sustainability. In the analysis of the study, the relationship between the effectiveness of entrepreneurship education and individual creativity levels of students who take entrepreneurship in economics and management sciences is investigated. As a result of the analysis, it was determined that the participants' scores for the effectiveness of entrepreneurship education were high, and that there was a positive relationship between the individual creativity level and the level of entrepreneurship education effectiveness.

Keywords:

Creativity, Entrepreneurship Education, Economics and Management Sciences, Sakarya University

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Chapter Structure:

1. Introduction
2. Creativity and Entrepreneurship in Economics and Management Sciences
3. Entrepreneurship in Economics and Management Sciences
4. The Relationship between Creativity and Entrepreneurship in Economics and Management Sciences
5. Creativity Process in Entrepreneurship in Economics and Management Sciences
6. Entrepreneurship Education in Undergraduate and Graduate Education in Economics and Management Sciences
7. The Role of Education and Training Processes in Economics and Management Sciences in Raising Creative Students, Entrepreneurs and Managers
8. Efficiency and Sustainability of Education and Training Processes in Economics and Management Sciences in Raising Creative Students, Entrepreneurs and Managers
9. Empirical Evaluation of the Effectiveness of Education and Training Processes in Economics and Management Sciences in Raising Creative Students, Entrepreneurs and Managers
10. Conclusion and Evaluation
11. References

1 Introduction

Creativity and individual investment in economics and management sciences have been one of the effective factors in the development of many scientific fields. Creativity, which was influential in fields such as fine arts and design at first, later played a key role in the development of many fields from education to health, from politics to economy, management and technological development.

Individual creativity education is an important factor in the development of creative thinking skills in all educational processes and curricula. Globalization with developments in information and communication technologies have increased the importance of creativity, and the creative individual has taken an active role in the development of organizational culture. Thus, the creative individual has become capable of producing and implementing new or innovative ideas with the ability to research and analyze together with the educational processes. Creative individuals are open to criticism. These people solve problems using their own ideas and techniques. Although creativity and genetic characteristics are important in the emergence of entrepreneurial personality, factors such as family, education and income level are effective.

Entrepreneurs should be able to use initiative, take risks, be determined, have high imagination, multi-dimensional thinking and creativity. In order to be an entrepreneurial individual, education is of great importance as well as genetic characteristics such as knowledge, skills and abilities. Entrepreneurship, which is a tool of both economic and managerial development, is an effective human capital element in the development of social life. In order to create and implement a new idea, the relationship between entrepreneurship and creativity should be well established. In the literature, the relationship between entrepreneurship and creativity is generally expressed as establishing a new organization, taking responsibility, seeing and defining risks and opportunities and transforming them into marketable ideas, being innovative and progressive.

It is possible to list the factors that affect the entrepreneurial tendency and encourage people to be entrepreneurs as achievement, being innovative, family and environment factor, social culture and education. Each of these qualities can affect each other, as well as change the psychological structure, ways of thinking and behaviors of entrepreneurs. Accelerating the economic development and development of countries depends on raising creative entrepreneurs. The success of creative entrepreneurs is expressed by the economic values they provide in the development of the country's economy. In recent years, there has been a trend towards creativity, innovation and entrepreneurship from knowledge-based educational activities in economics and management sciences.

The effectiveness of education programs on entrepreneurship in higher education insti-

tutions is increasing. Entrepreneurship education provided by universities is generally given by the departments of the Faculty of Business, Economics and Political Sciences and postgraduate education programs. For this reason, it is important to examine the role of entrepreneurship education programs on the development of creative student abilities and on students' entrepreneurial tendency.

In this chapter, the contributions of educating creative students in economics and management sciences on entrepreneurship and economic development processes are evaluated by taking the education and training processes of Sakarya University as an example.

2 Creativity and Entrepreneurship in Economics and Management Sciences

2.1 Creativity

Creativity is basically the ability to develop new ideas on practices, procedures, products and services, to think focused on continuous change, to establish a new management organization and to produce a new product, to create new ideas, intuitions, inventions or products (Shalley, 2004; Demirci 2007; Baden, 1994). Creativity is not only creating an original and new product, but also producing alternative solutions from existing information and adapting to new situations (Karataş and Özcan, 2010).

Creative and creative thinking skills have attracted attention in every period of history, and for many years it has been seen as an intellectual process or product specific to gifted and genius people. In the 21st century, this point of view has changed, and research has shown that every person has more or less creativity skills (Yeşilyurt, 2020). Even though creative thinking was seen in fields such as architecture and art, today it has emerged as a key concept in the development of many fields from education to health, from economy to management and technology (Koray, 2005).

It is aimed to develop individuals' creativity and creative thinking skills in all educational processes and curricula from primary school to university. Studies on this subject draw attention to the fact that such skills exist in every person and can be developed through education. Therefore, the ability to think creatively, which can be developed with education, is also considered as an important output of education systems (Yeşilyurt, 2020).

Developments in information and communication technologies after globalization have increased the importance of creativity, and creativity has been the most effective way for organizations and organizational culture to compete in global markets for a long time (Shoghi et al., 2013; Yu and Frenkel, 2013). While creativity increases organization-

al performance, it also creates a driving force in the development of economy, culture, technology and science (Chang and Hsu, 2013).

Today, organizations engage in creativity activities to create differences and value for their customers. The key source of innovation for organizations is the creativity of employees (Karcioğlu and Kaygın, 2013; Kanbur and Özyel, 2016).

2.2 Characteristics of Creative Individuals

A creative individual should be open to innovations, be patient, have the ability to think logically, be prone to research and analysis, and have encouraging features. In order to gain these features, they need to receive theoretical and applied education at the university, make group work to make strategic decisions and learn problem-solving techniques, participate in projection studies, benefit from the experience of various sector managers with the sector meetings course. Although the definitions of creativity and creative thinking differ according to disciplines and approaches, there are common and general characteristics about the characteristics of the creative individual.

Creativity personality generally focuses on people's creative aspects, their informational, educational, intellectual (intelligence) personality. This feature, which differs from person to person, is a versatile thinking product. It is possible to list the general characteristics of the creative individuals as follows (Starko, 2010; Yeşilyurt; 2020).

- - Act bold, confident, humble and calm.
- - They are hardworking, have high energy and use their energy in the right and necessary places.
- - Open to innovations and new experiences.
- - Sensitive to events and have high observation power.
- - They like to share and succeed with a focus on cooperation.
- - Willing to take risks.
- - Reliable, idealistic and determined.
- - Deep thinker, able to objectively evaluate changing events and situations, and are open to criticism.
- - Make rational, versatile decisions, think in detail and act solution-oriented.
- - Have the characteristics of a leader, determined and perfectionist.
- - Skeptical, love hard work, can make independent decisions.

The creative individuals enables them to produce and implement new or innovative ideas, and can use their ability to establish and implement a new organization. It activates creativity and makes it more open to try new or creative ideas. Creative people are willing to take the risks of trying new ideas (Onur and Zorlu, 2017).

In providing sustainable employment, the trainings given on the above-mentioned characteristics play an important role in raising creative individuals. Today, creative individuals who have many of these features constitute the indispensable human capital of businesses. Therefore, successful businesses have special efforts to find and retain creative employees. In this context, the trainings given at the undergraduate level make a serious contribution to the emergence of these features.

2.3 Individual Creativity

Individual creativity is the establishment of relationships to present new and different ideas within the information in the minds of people. This feature creates a superior performance by solving problems effectively and creatively (Grewal et al., 2009).

Studies suggest that three basic factors are effective for individual creativity (Yeşil and Hatunoğlu, 2019). These; expertise, creative thinking ability and motivation. Expertise is based on knowledge, competence and skills to make creative contributions in the field. Creative thinking ability includes different thoughts and personal abilities. Task motivation refers to the desire to work on something. Recent studies agree that these three factors will drive more creativity. Creative thinking; originates from producing original ideas, original approaches and new perspectives. In any creativity activity, producing or evaluating more or less ideas is simultaneous and continuous (Nickerson, 1999). Creative workers tend to identify opportunities for new products. These individuals not only come up with a creative solution but also develop successful plans for the implementation of these solutions and new ideas. This enables the development of innovative products at the organizational level in generating and applying creative ideas.

It is to develop new methods, technologies, processes to increase individual creativity, business excellence and organizational performance, to ensure competitive advantage and continuity of the organization.

Creative behavior differs from person to person. These differences may depend on the person's structure, education and cultural environment. Considering cultural differences, there are also differences in creativity in individualist and collectivist societies (Eisenberg, 1999).

Factors affecting creativity in individualistic societies may be a reward system that people may have because of their age, the complexity of their work or duties, or the effects they are exposed to. In collectivist societies, showing the person as an example by other people or acting together with the society instead of prioritizing themselves are among the factors affecting creativity (Erdem et al., 2002).

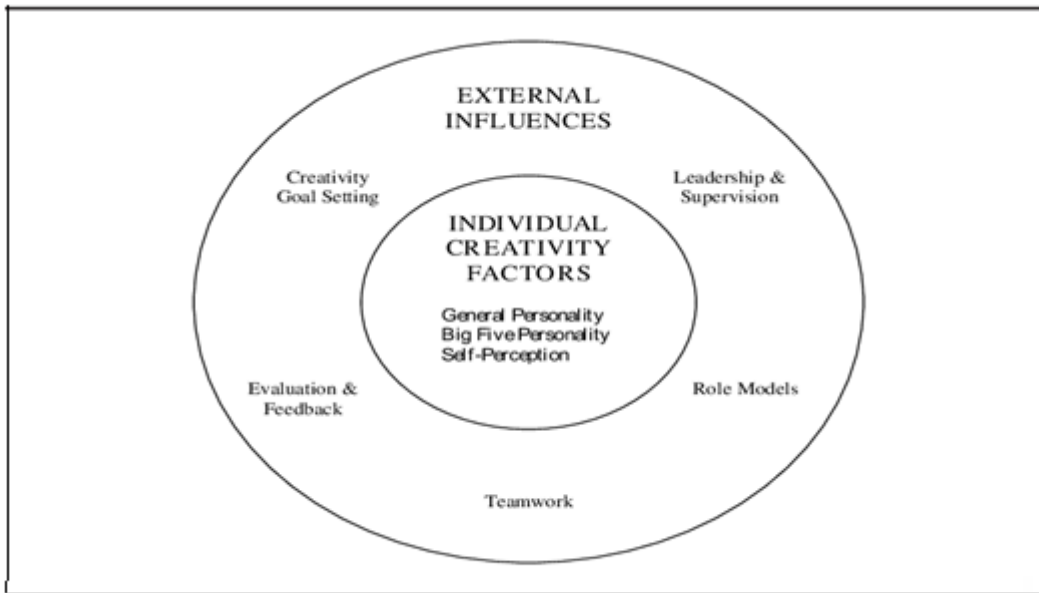


FIGURE 1: Key Factors Explored in Individual Creativity Research

Kaynak: Marshall Egan T. (2005), *Factors Influencing Individual Creativity in the Workplace: An Examination of Quantitative Empirical Research*, *Advances in Developing Human Resources*, 7: 160-181.

In Figure 1, five different attributes related to individual creativity factors are important. Egan (2005) states that individual creativity factors as follows; “the general personality contains innate personality traits in the development of creative ideas or outputs; the big five personality is a concept that hierarchically positions personality traits as conscientiousness, openness to experience, extroversion, neuroticism, and agreeableness; and the self-perception deals with employees’ own perceptions of their work-related creativity.” The five sub-areas under external influences include creativity, goal setting, evaluation and feedback, teamwork, role models, and leadership and supervision.

These analogies for creative people also apply to entrepreneurs. Entrepreneurs also do not follow classical thinking and often adopt the path contrary to the existing classical approaches. They also think flexibly and adaptively when solving problems. This feature also forms a part of their creativity process. These individuals can give more constructive and problem-solving responses to stressful situations (Erdem et al., 2002).

Creative individuals do not worry about making mistakes and being criticized. Creative thinkers do not limit themselves to the dominant views in other approaches. These people solve problems using their own ideas and their own techniques. The basis in these ideas and techniques is based on trusting one’s own understanding and intuition. It is clear that entrepreneurial people have different personality traits (Saraçoğlu et al., 2010).

3 Entrepreneurship in Economics and Management Sciences

Entrepreneurship is an important factor in the development/development of national economies and is the relationship of generating ideas and taking risks in order to benefit from opportunities. Entrepreneurship includes taking initiative, creating new areas of use for resources, providing the organization of social, economic and managerial processes, and taking risks. At the same time, it is a set of processes consisting of the scope of obtaining gains that contribute to the society and market economy through elements such as providing organizations on an individual and group basis, processing new products and services, processes and technology (Naktiyok, 2004; İrmiş et al., 2010; Challenging and Trigger, 2018).

In addition to the genetic characteristics of the individual, environmental factors such as family, education and income level have an impact on the formation of an entrepreneurial personality. For this reason, the entrepreneur should be able to take risks, be determined, have a strong intuition, good observer, high imagination, versatile and independent thinking, high persuasion power, flexible, creative and self-confident (Başar et al., 2013).

Entrepreneurial leadership is a type of leadership that includes behaviors related to the establishment of an enterprise at the individual level, behaviors that follow innovations at the organizational level, and behaviors related to taking advantage of the opportunities distinguished at the market level (Alvarez and Barney, 2002). Successful entrepreneurs have the ability to achieve efficiency and explore new opportunities. They generally advocate the idea that entrepreneurial leadership, which is a new leadership style, offers a transformation from the past to the future (Fernald et al., 2005). Entrepreneurial leadership is a concept that emerges by blending the leadership potential with the entrepreneurial spirit, and it is also defined as influencing the employees to achieve organizational goals. The entrepreneur is a new leadership model and must be able to create new products, new processes and new development opportunities. Entrepreneur is the pioneer of innovation, introducing new products, processes and organizational forms.

The characteristics of successful entrepreneurs can be expressed as follows (Hisrich and Peters, 1998):

- creative thinking skills
- Desire to work at a high level
- Courage, passion and determination
- Ability to interact with people at a high level,
- Ability to express themselves orally and in writing,

- Loving their job and job motivation,
- A rich subconscious and imagination,
- Predisposition to team and teamwork,
- Having a personal vision and mission,
- Being open and willing to change, transformation,
- Ability to act with flexible tolerance,
- Sincere, reliable, sympathetic and humorous personality,
- Having high ability to convince and persuade people,
- Management and leadership skills,
- Desire and excitement to complete work,
- Foresight and the habit of seizing opportunities

It is possible for individuals to acquire the characteristics such as knowledge, skills and abilities necessary for being an entrepreneur through education. Since education, which is an important factor affecting entrepreneurship, is a major factor in the emergence and development of entrepreneurship, it should be of a quality to develop the entrepreneurship of individuals (Lekoko et al., 2012). In order to increase the number of entrepreneurs; Issues such as macroeconomic stability, ease of access to finance, fair, simple, widespread and low taxation, flexibility of the market to entrepreneurs, qualified workforce, freedom of entry and exit to the market are very important.

Entrepreneurs as a tool of both economic and social development became the focus of attention of researchers in both psychology and business administration in the mid-1900s, thanks to a particular interest arising from the end of World War II and the need to rebuild industry and countries. In both economics and psychology, the characteristics of an entrepreneur, especially the tendency to take risks and take action to change the current situation, distinguish him from the ordinary homo-economus (Hoppe, 2016).

3.1 Characteristics of Entrepreneurial Individuals

The characteristics of entrepreneurial individuals emerge as a result of mutual interaction between the environment and the individual. In this interaction, the entrepreneur's genetic characteristics, life position, experiences, and changes in the individual's life play an important role. There are various opinions about the characteristics of entrepreneurs. Entrepreneurial characteristics can be divided into innate or acquired, or psychology and social based.

In this context, it is possible to list the prominent features as follows: (Caliendo and Kritikos, 2011; Stamboulis and Barlas, 2014; Zhao et al.,2010; Din, et al., 2016).

- Confidence

- Risk Taking Tendency
- Relationship with People
- Uncertainty Tolerance (The Ability to React Positively to an Adverse Situation)
- No Need to Achieve
- Control Focus (Person's Ability to Control Oneself in the Face of Occurring Situations)
- Independence
- Innovativeness
- Creativity

In order for a new idea to be implemented, the relationship between entrepreneurship and creativity must be well established and implemented. Although entrepreneurship varies depending on national and organizational cultural factors, it is a concept related to disciplines such as economy, psychology and sociology (Bozkurt et al., 2012). The definitions made in the literature on the relationship between entrepreneurship and creativity are generally seen to be establishing a business, strong foresight, taking responsibility, innovative thinking, seeing risks and opportunities, management and innovation concepts are frequently used. (Kuratko, 2001). Entrepreneurship is expressed with behavioral theory that focuses on the attitudes and behaviors of entrepreneurs. This theory tries to explain the nature of entrepreneurial behavior since every behavior has a reason and occurs as a reaction to anything (Bridge et al., 1998).

Today, an entrepreneur should have the characteristics that can look at the changing world with a different and questioning eye, and contribute to the development and dissemination of current ideas and thoughts by using environmental factors and different cultures effectively. At the same time, it has the ability to react instantly and quickly to the changes around it and the differences in its customer portfolio, can foresee the changes that may occur in the future with the knowledge and experience it has received from the past and enable the necessary measures to be taken for these changes, benefit from the different religions, cultures, social and mental differences in the world and make use of them. In order to achieve the optimum production level with the scarce resources at their disposal, they must have features that minimize waste (Gül, 2005; Altınışik and Külen, 2020).

3.2 Factors Affecting Entrepreneurial Tendency

Factors affecting entrepreneurial tendency and encouraging people to become entrepreneurs are as stated below; (Bilge and Bal, 2012; Keleş et al., 2012; Akkaya et al., 2014; Yüksel et al., 2015).

- Personal Traits Factor (Need to Achieve, Innovation, etc.),

- Family Factor
- Environmental Factor
- Social Culture
- Education

Each of these factors can mutually affect each other, and the person's psychological structure, ways of thinking and behaviors can change (Çalışkan et al., 2012).

The family factor is an element that encourages family entrepreneurship and intra-family entrepreneurship. Parents' age, gender, etc. It has been seen that demographic characteristics and motivating their children are effective in young people having entrepreneurial characteristics. It has been seen in many studies indicated that families with good incomes have more self-confidence and courage, and thus, entrepreneurial spirit is also high. The environmental factor has a very important role in determining the creativity of the individual. Environment is the main determinant of people's risk-taking ability (Bayraktar and Karadeniz, 2016).

The cultural structure of the society in which the individual lives also contributes to the personal development of the individual and to the rise of entrepreneurial characteristics. The education that an individual with an entrepreneurial personality receives can facilitate the process of producing effective solutions to problems. As a result, entrepreneurial tendency should include features that can be developed with the individual's family, environment, cultural structure and education of the society in which they live.

4 The Relationship between Creativity and Entrepreneurship in Economics and Management Sciences

It is seen that the concept of entrepreneurship is explained with creativity, innovation, risk taking, flexibility and dynamism and development orientation. In particular, it is generally accepted that creativity and innovation are important elements of entrepreneurship.

It is possible to list the factors affecting entrepreneurship as the genetic structure of individuals, growing conditions in the family, qualified education and work experience. In addition, factors from the past, organizational factors such as internal and external motivation, interaction and communication in the workplace, and economic conditions, environmental risk, availability of resources, existing entrepreneurship stories and examples, use of support and consultancy services, manpower and service adequacy etc. It is also possible to list them as environmental factors (Korkmaz, 2000). Thus, many factors affect entrepreneurship development.

Entrepreneurs bring creative thinking into a viable situation by combining imagination and thought. In this context, entrepreneurs are in an effort to identify opportunities arising from the needs and demands around them. (Kuratko and Hodgetts, 1992). The fact that creative and entrepreneurial individuals perceive the problems they will encounter while making decisions in education and business processes as an opportunity is a factor that develops entrepreneurship. The problem, which can be defined as the difference between the current situation and the desired and desired situation, requires the perception of the current situation and the mental shaping of the desired situation. This will make entrepreneurship so strong (Mert et al., 2009). Many individuals with high creative potential may fail to implement their new and different ideas. This failure is usually due to the lack of entrepreneurial potential of these individuals. Similarly, some people with high entrepreneurial potential may be weak in producing different, new and creative ideas (Ford and Gioia, 1995). Any non-holistic approach reduces entrepreneurial success by reducing our ability to generate creative ideas. Organizations should highlight the entrepreneurial characteristics of their employees by supporting new and innovative ideas.

With globalization, the economic development and development of countries depends on raising creative entrepreneurs who can keep up with rapidly changing conditions and contribute to the country's economy. Today, it is seen that the number of creative entrepreneurs is very low and not sufficiently supported in almost all underdeveloped and developing countries. Today, the success of creative entrepreneurs is measured by the economic values they reveal in the economic development of the country (Altınışik and Külen, 2020).

5 Creativity Process in Entrepreneurship in Economics and Management Sciences

The characteristics of creative people also apply to entrepreneurs. Entrepreneurs often follow a path contrary to existing approaches. They also think flexibly and adaptively when solving problems. This feature also constitutes a part of their creativity processes (Top, 2006). Creative entrepreneurs who seek new opportunities and exhibit innovative behavior can respond more constructively and problem-solver to stressful situations. People with creative thinking solve problems using their own ideas and their own techniques (Suojanen and Brooke, 1971). In addition, age, gender, education and entrepreneurial family background parents were found to be effective on entrepreneurship. It has been determined that men are more prone to entrepreneurship than women, entrepreneurship increases with higher increasing education level, and children of entrepreneurial mothers or fathers are more entrepreneurial.

- • Determination of the need
- • Review of available information
- • Interpretation and internalization of knowledge
- • Sensing the difference
- • It can be expressed as the evaluation of the results.

In recent years, there has been a change in economics and management sciences, from knowledge-based activities to creativity, innovation and entrepreneurship. With the acceleration of the globalization process and rapid technological development, many and new business opportunities have emerged. At the same time, intense competition is encountered with the increase in the production of goods and services. Creativity provides some opportunities and conditions for innovation and growth to provide the entrepreneur with a competitive advantage in the business (Fillis and Rentschler, 2010).

6 Entrepreneurship Education in Undergraduate and Graduate Education in Economics and Management Sciences

Entrepreneurship education, which is included in the education and training programs of Economics and Management sciences, is given at undergraduate and graduate levels. This training is revised and updated within the scope of strategic training processes. Sakarya University, which is considered as a leading university in Turkey, has included the “Entrepreneurship and Project Management” course in all faculties within the education curriculum as a university common elective course as a graduation requirement. In the undergraduate curriculum of the departments of business and political sciences, which provide education as economics and management sciences, courses on entrepreneurship, entrepreneurship and project management, case studies in entrepreneurship, entrepreneurship finance, foreign trade entrepreneurship, entrepreneurship for the Turkish chemical industry, entrepreneurship in the health sector, social entrepreneurship are given.

These courses aim to improve the ability of individuals to produce and manage projects while increasing their entrepreneurial skills, to provide experiential and practical learning, to learn financial thinking, tools and techniques adapted to the field of entrepreneurship, to establish a basis for increasing entrepreneurship skills on a sectoral basis, and at the same time to learn how to value projects and investments. solutions and improving students’ analytical thinking and interpretation skills.

Courses on Entrepreneurship and Creativity are given both theoretically and practically in the graduate education and training programs of Sakarya University, Economics and Management Sciences. There is a master’s program with thesis called “Entrepreneur-

ship and Innovation Management” within the Institute of Business Administration. The program eliminates the inconsistency between the education given in the classroom environment in entrepreneurship education and the practices of real life with sector lessons. Within the scope of this program, the basic concepts of entrepreneurship, business model creation and business plan preparation, modern management practices, marketing management in entrepreneurship, innovative business idea development, legal processes in entrepreneurship, case study in entrepreneurship, enterprise resource planning, technology and product management, new approaches in entrepreneurship, quantitative courses such as research techniques, international entrepreneurship, innovation management, financing of new ventures, management and institutionalization in family businesses, project preparation and management, new business models in digital transformation, strategic management and entrepreneurship, entrepreneurship and business ethics, qualitative research techniques, entrepreneurship simulations are given.

As a result of studying these courses, students gain competency about evaluating the formation processes of entrepreneurship from a theoretical and practical perspective, writing a clear, comprehensive, applicable and convincing business plan, gaining the managerial skills that the entrepreneur will need in the process of managing the business, gaining the ability to discuss these concepts related to marketing and entrepreneurship. They learn to analyze popular entrepreneurship fields such as techno-entrepreneurship, green entrepreneurship, intrapreneurship and social entrepreneurship while synthesizing entrepreneurship activities on an international scale, gaining specific knowledge about the management of family businesses, processes in investment projects and business planning applications. Increasing awareness about the impact of the digital transformation process on business management and organizations, external environment analysis, industry branch analysis, purpose, target, mission, purpose structure and hierarchy, internal environment analysis, SWOT analysis, strategy types, strategy formulation and portfolio analysis etc. are also aimed at.

7 The Role of Education and Training Processes in Economics and Management Sciences in Raising Creative Students, Entrepreneurs and Managers

Today, with the increasing importance given to entrepreneurship, the effectiveness of education programs related to entrepreneurship in higher education institutions is increasing. Within the scope of the entrepreneurship education programs provided by the universities, the courses are generally given by the faculty members of the Faculty of Business, Economics and Political Sciences. For this reason, it is important to examine

the role of the entrepreneurship education curriculum in these sections on creative student development and students' entrepreneurial tendency. Yamak et al. In the study in (2019), in which the entrepreneurial behavior of the students was determined according to the university entrance score, it is seen that the numerical, verbal and equal weight scores are above 90% on average in terms of the characteristics that can be entrepreneurial. As a result, it is observed that entrepreneurship tendencies can increase with the development of entrepreneurship education programs in economics and management sciences.

Taş (2016), in his research on business department students, concluded that there is a significant and positive relationship between entrepreneurship education and entrepreneurial tendency, and that students' personality traits are not the only determinants. Duran et al. (2017), in their study on business and public administration department students, concluded that business students' sense of entrepreneurship is higher than that of public administration students, and that public administration students have a higher average in terms of entrepreneurial potential.

8 Efficiency and Sustainability of Education and Training Processes in Economics and Management Sciences in Raising Creative Students, Entrepreneurs and Managers

In order to transform the entrepreneurial tendency into practice, it is necessary to update the course content on entrepreneurship education and adapt to new developments. Updating the curricula of economics and management departments, which are more practical than theory, will help students gain creative skills and develop entrepreneurial tendencies.

Solomon(2007) states that faculties of economics and management sciences have educational curricula for business functions such as accounting, finance, marketing and human resources rather than entrepreneurship education. It is seen that the current entrepreneurship education curricula do not meet the needs, and they focus on theoretical knowledge rather than practice in the lessons. Vanevenhoven and Liguori (2013) state that the inconsistency between theory and practice stems from the difference between classroom education and real-life entrepreneurial activities. Entrepreneurship education given in the classroom environment is short-term, contains uncertainty, lack of operation and entry level, etc. indicates that it is insufficient due to its features.

For the sustainability of entrepreneurship education and its preparation for the future, it is important to eliminate the lack of theory and practice and to follow new

developments. Kuratko (2005) states that the solution to eliminate the gap between theory and practice is to update the stereotypes and classical education curricula. Von Graevenitz et al. (2010) stated that entrepreneurship education should not only be carried out through the preparation and writing of a business plan, but also that it would be appropriate to prepare experimental environments such as entrepreneurship simulations, to prepare students for situations that they will encounter in real life, and thus to prepare curriculums suitable for the needs of learners and add them to the course curricula.

Bulut and Aslan (2014) state that it would be more effective to carry out the entrepreneurship course education curriculum to be given at universities through the entrepreneurship habitat. Accordingly, it is stated that only a group of students should not be focused on, that a lecture presentation with high participation should be made instead of a one-sided lecture, and that diversifying the courses that include the dynamics of the day is important in creating a successful course content. In addition, it is said that conducting education programs not only through economics and management department students, but also in a habitat where group interaction is high, including students from different faculties, business people and investors will increase success.

The European Commission (2008) states that entrepreneurship education, which should be given in business and economics departments of universities, should be structured to encourage students' creativity, innovation and personal employment. Accordingly, entrepreneurship education should have the following features;

- Development of individual qualities and skills based on entrepreneurial mindset and behaviors (creativity, initiative, risk taking, autonomy, self-confidence, leadership, team spirit, etc.).
- To raise awareness among students about entrepreneurship as a career option
- Working on concrete venture projects and activities
- Gaining certain skills on how to establish and successfully manage a business.

9 Empirical Evaluation of the Effectiveness of Education and Training Processes in Economics and Management Sciences in Raising Creative Students, Entrepreneurs and Managers

9.1 Method

In this part of the report, the purpose, sample and findings of the research are given.

Purpose of the Research

This report examines the effects of raising creative students in economics and man-

agement sciences on entrepreneurship and economic sustainability. Creativity education, which has come to the fore in recent years, especially at the undergraduate level, is an important element in the development of creative thinking skills. Along with globalization, developments in information and communication technologies have increased the importance of creativity and played an active role in the development of organizational culture and the formation of new ideas. Thus, the creative individual has become able to produce and implement new or innovative ideas with the ability to research and analyze together with the educational processes. In the empirical part of this study, the relationship between the effectiveness of entrepreneurship education and individual creativity levels of students taking entrepreneurship courses in economics and management sciences is investigated.

Sampling and Data Collection

The sample of the research consists of students who are studying at the Faculty of Political Sciences and Business Administration at Sakarya University and taking the entrepreneurship course.

A questionnaire technique was used to collect the data of the research. Answers were collected by face-to-face distribution of questionnaires to the participants. The collected 405 questionnaires were evaluated and included in the study. The data obtained from the research were subjected to statistical analysis in accordance with quantitative analysis techniques. SPSS 21.0 statistical program was used in the analysis of the data in the research, and frequency analysis, internal consistency test, basic statistics and correlation analysis were used to analyze the data.

Scales

While preparing the "Efficiency of Entrepreneurship Education" and "Individual Creativity" scales were used in the study. The literature on the subject was examined and an item pool was created. The prepared items were first presented to the expert opinion, after the necessary revisions arrangements were made, they revised forms of scales were finalized and a pilot application was made.

The Effectiveness of Entrepreneurship Education Scale consists of 18 statements and the Individual Creativity Scale consists of 6 statements. The scales have a 5-point Likert-type rating of 1 "strongly disagree" and 5 "strongly agree".

9.2 Findings

Table 1. Demographic Characteristics of Participants

Variable	Category	Frequency	Percent
Gender	Female	220	54,3
	Male	185	45,7
TOTAL		405	100

Table-1 shows the demographic characteristics of the participants. Accordingly, 220 (54.3%) of the participants were female and 185 (45.7%) were male.

Table 2. Reliability Findings of the Efficiency of Entrepreneurship Education and Individual Creativity Scales

Variables	C Cronbach's Alpha Value	Number of Expressions
Effectiveness of Entrepreneurship Education	0,824	18
Individual Creativity	0,792	6

The internal consistency value of the individual creativity scale was tested with the Cronbach Alpha reliability analysis and the alpha value was calculated as 0.79. Similarly, the internal consistency score of the scale used to measure the efficiency level of entrepreneurship education was calculated as 0.82. These findings show that the reliability level of the scales is high.

Table 3. Mean and Standard Deviation Values of the Efficiency of Entrepreneurship Education and Individual Creativity Scales

Variables	N	Minimum	Maximum	Average	Standard Deviation
Effectiveness of Entrepreneurship Education	405	3,00	5,00	3,7696	,38978
Individual Creativity	405	1,33	5,00	3,9958	,68054

The mean value for the effectiveness of the participants' entrepreneurship education was calculated as 3.76. This finding indicates that the entrepreneurship education of

the participants is suitable for the purpose and that the entrepreneurship education is effective. Because all participants have received entrepreneurship training before. In the measurement made after this training, it can be stated that the participants' scores for the effectiveness of the entrepreneurship training are high.

The average value of the participants' individual creativity levels was calculated as 3.99. This finding shows that the level of individual creativity of the students participating in the research is generally high.

Table 4. Correlation Analysis between the Efficiency of Entrepreneurship Education and Individual Creativity

Variables		Effectiveness of Entrepreneurship Education	Individual Creativity
Effectiveness of Entrepreneurship Education	Pearson Correlation	1	,306**
	p		,000
	N	405	405
Individual Creativity	Pearson Correlation	,306**	1
	p	,000	
	N	405	405

**The correlation is significant at the 0.01 level.

As a result of the analysis, a positive relationship was obtained between the individual creativity level of the participants and the efficiency level of entrepreneurship education. Accordingly, it is concluded that entrepreneurship education can foster high individual creativity levels.

10 Conclusion and Evaluation

Entrepreneurship is expressed as the process of creating value on an individual and social basis by bringing together resources in order to benefit from social, cultural and economic opportunities. Intense competitive environment requires creativity and related factors to be taken into account in entrepreneurship. While creativity is the construction of new and potentially useful ideas or products, it is important in entrepreneurship as qualities that contribute to innovation and profitability in monetary and social terms.

Developed countries give more importance to creativity and creative brain power as well

as entrepreneurship and innovation in today's economic conditions. Because the phenomenon of entrepreneurship is seen as an important contributor to economic growth and job creation in creating new opportunities.

Entrepreneurship enters the strategic plans and educational curricula of many countries. Therefore, it is included as the subject of much research in terms of its actuality, economic and social importance. Entrepreneurship education is important for the development of a country's entrepreneurial skills, attitudes and behaviors. In this respect, entrepreneurship education in universities has a positive effect on attitudes towards entrepreneurship and the sustainability of these activities. Increasing the individual creativity levels and characteristics of young people in revealing new and value-adding initiatives creates value in terms of economic sustainability.

In recent years, it has been seen that innovative and creative activities have come to the forefront and businesses continue to exist by making a difference through these in an environment of increasing competition with globalization and developing technology. In terms of both companies and national economies, the establishment of new businesses, the creation of new employment areas and the increase of new enterprises are involved in the realization of development and growth.

Although creativity takes on a socially synergetic structure in the formation of new ventures, individual creativity is a driving factor in the first stage. For this reason, it is necessary to encourage and develop the creativity of individuals at the stage of university education, and to direct them to imagination, thought and creativity.

This chapter examines the effects of raising creative students in economics and management sciences on entrepreneurship and economic sustainability. In this context, the relationship between the effectiveness of entrepreneurship education and the level of individual creativity of students taking the entrepreneurship course in economics and management sciences was investigated. As a result, a positive relationship was obtained between the individual creativity level of the students and the efficiency level of entrepreneurship education.

Many creative individuals in society may fail to put their new and different ideas into practice. This is due to their lack of entrepreneurial equipment. Likewise, many people with high entrepreneurial potential may be weak in generating creative and new ideas. For this reason, it is important to give applied entrepreneurship courses to individuals with high individual creativity. In terms of economic growth and sustainability, it is considered as an important issue to increase entrepreneurship education in economics and management faculties, to contribute to the business world with the projects they will do according to their interests, and to provide opportunities for them to use their creativity.

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Chapter 3.5

Nurturing the entrepreneurial mindset: Exploring motivation, personality, and Creativity in Entrepreneurship

Abstract:

This chapter explores the multifaceted aspects of entrepreneurship, focusing on the personality traits, motivations, skills, and creativity that drive individuals to become successful entrepreneurs. Drawing on various theories and research in the field, the article highlights the importance of adaptability and effort in navigating the entrepreneurial environment, which is influenced by macroeconomic factors and characterized by intense competition and potential risks. It underscores the role of motivation as a driving force in the entrepreneurial journey, encompassing a range of factors such as financial rewards, personal fulfillment, social impact, and professional autonomy. Additionally, this body of work discusses the significance of skills, including general and specific abilities, in achieving entrepreneurial success. Moreover, it explores the relationship between attitudes and skills, emphasizing the interplay between individual inclinations and competency development. The concept of creativity is examined, emphasizing its opposition to conformity and the role of risk-taking in fostering innovation and novelty. Overall, this comprehensive examination provides valuable insights into the multifaceted nature of entrepreneurship and the factors that contribute to successful entrepreneurial ventures. To enhance the integration of theory with interactive learning, it curates a collection of exercises suitable for both educators and learners, which aim to provide engaging experiences that facilitate a deeper understanding of the subject matter.

Keywords:

entrepreneur, satisfaction, motivation, personality, theories.

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1 Introduction

In this chapter, we embark on an in-depth exploration of the intricate and dynamic realm of entrepreneurship, thereby hopefully deepening and widening the information provided in previous chapters. We scrutinize the successful entrepreneurial venture's constituting elements, casting a spotlight on the harmonious dance between individual predispositions and skill growth. We emphasize the pivotal role that personal development, education, and teamwork can play in surmounting individual shortcomings while also accentuating the essentiality of creativity, courage, and entrepreneurial fervor in birthing innovation and originality.

Uniquely curated, this chapter strikes a compelling balance between theoretical comprehension and experiential learning. It unveils an array of thought-provoking exercises designed to pique the interest of educators and learners alike. These carefully crafted exercises are geared towards encouraging self-reflection, honing writing proficiency, and fostering a well-rounded perception of the highs and lows accompanying entrepreneurial ventures. Furthermore, they stimulate critical thinking, promote effective communication, and nurture the capacity to appreciate diverse perspectives.

As you journey through this cohesive body of work, you will be introduced to the kaleidoscopic facets of entrepreneurship, encompassing the myriad personality traits, motivations, competencies, and creative prowess that define successful entrepreneurs. You will appreciate the significance of resilience and dedication in maneuvering the unpredictable landscape of entrepreneurship. You will gain profound insights into how individual predispositions intertwine with skill development, grasp the essence of creativity and its rebellion against conformity, and understand how embracing risk serves as the lifeline for innovation and novelty.

In summary, this chapter aims to serve as an invaluable guide for all who seek to delve into the world of entrepreneurship and the secret recipe behind triumphant entrepreneurial ventures. It ingeniously marries theoretical knowledge with practical, interactive learning, making it an indispensable resource for educators and learners. The enriching exercises embedded within these pages promise an immersive learning experience that deepens comprehension of the subject matter, fosters critical thinking, and hones communication skills while cultivating an appreciation for diverse perspectives.

2 Definitions

“The term “entrepreneur” originates from French and emphasizes the primary function of individuals engaged in entrepreneurial activities. However, there is no universally accepted definition of an entrepreneur. The conception of entrepreneurship has evolved over the years and it is not limited to traditional business enterprises alone.

Ronstadt (1987) and Kuratko (2005) propose that an entrepreneur is a person who takes on the responsibility of identifying and acquiring the resources necessary to initiate a venture. This could be a business, a non-profit organization, or a community project.

Kanvesky et al. (2017) suggest that entrepreneurs are individuals who manage resources to start and/or develop initiatives that emphasize innovation and the creation of new products, services, or solutions. This perspective implies that an entrepreneur is not just a business initiator but also an innovator.

Consequently, entrepreneurs can be found not only in traditional business environments but also in social, community, and political arenas where they create value and drive change. They can be seen in various fields, including education, medicine, research, law, architecture, engineering, and social activities (Manolova et al., 2008). They might initiate change through social enterprises, community projects, and grassroots initiatives that aim to address social, environmental, or community challenges.

The work of an entrepreneur, regardless of the specific context, entails significant effort to adapt to the entrepreneurial environment, which can be shaped by a variety of macroeconomic or societal factors.

The pursuit of entrepreneurship is often a goal for those who appreciate the rewards that come with the role. These individuals are willing to dedicate their physical, intellectual, and emotional strengths, demonstrating a tenacious spirit and acceptance of the potential risks and demands that come with the journey. The realm of entrepreneurship comes with a variety of challenges, including unpredictable income, the possibility of capital loss, the weight of full responsibility, career uncertainty, ethical dilemmas, rigorous work schedules, potential tensions within family relationships, and possible health implications.

Motivation is a key factor in an individual’s self-governance and overall personal and psychological growth. For entrepreneurs, motivations are diverse and often interconnected. These can encompass the potential for significant income, the prospect of a comfortable lifestyle for their families, the satisfaction derived from autonomy, the allure of status, the expansion of social connections, job security, and the opportunity

to contribute to societal and community advancement. These motivations interplay to drive actions that reinforce the entrepreneur's drive to launch and grow a venture.

Recognizing a business opportunity is not enough; it must be maximized, as even small opportunities can be the start of significant achievements. The role of an entrepreneur must be embraced convincingly, without hesitation, and with unwavering determination. Capitalizing on opportunities requires a coherent and concerted set of qualities that entrepreneurs must possess to achieve success. Traits such as creativity, inventiveness, resourcefulness, bravery, determination, persuasiveness, entrepreneurial spirit, willingness to work hard, readiness for sacrifices, adaptability, effective communication, sociability, and a humanistic mindset are essential for successful entrepreneurship.

However, the absence of some of these qualities should not discourage those who are strongly motivated to pursue entrepreneurship. Some limitations can be overcome through training, self-discipline, or by carefully selecting partners and team members who can compensate for individual limitations.

It is true that the entrepreneurial spirit is often considered an inherent gift, distinguishing individuals from an early age. Unlike other talents that can be detected and nurtured through various methods such as music, drawing, or dance, the entrepreneurial spirit is more challenging to identify early on. Psychological tests can serve as a valuable tool, but they are not sufficient on their own and require careful design and interpretation.

3 Preliminary thoughts on entrepreneurial satisfactions and motivations

3.1 The entrepreneur's satisfactions and dissatisfactions

Starting a business can provide significant satisfaction for entrepreneurs, but it also entails inherent risks that can lead to dissatisfaction. According to Sasu (2001), the key satisfactions of engaging in business activities include the following:

- **Controlling one's own destiny:** By owning a business, entrepreneurs gain independence and the ability to make personal decisions, allowing them to shape their own paths. For example, Giovanni, a passionate chef, decides to open his own restaurant to have full control over the menu, atmosphere, and customer experience.
- **Reaching maximum potential:** Entrepreneurship offers the opportunity to reach one's full potential, both professionally and personally. Lisa, a talented graphic designer, starts her own design agency to explore her creativity and push her skills to new heights.
- **Unlimited earnings potential:** Owning a business allows for the possibility of un-

limited financial gains. Mark, a skilled real estate investor, establishes a property development company to capitalize on lucrative investment opportunities and generate substantial profits.

- **Job security:** Entrepreneurs can secure their own jobs and have the freedom to continue working for as long as they desire, without facing retirement age limitations. Sarah, an experienced software developer, becomes an entrepreneur to ensure long-term job security and avoid the uncertainty of traditional employment.
- **Reinvestment of accumulated capital:** Entrepreneurs can reinvest the capital they accumulate from their business into further growth and development. Alex, a successful entrepreneur in the tech industry, uses his profits to fund research and development for new innovative products.
- **Application of knowledge and skills:** Entrepreneurship enables individuals to apply their own expertise and skills to their business ventures. Laura, a trained fitness instructor, starts her own fitness studio to share her passion for health and wellness and utilize her knowledge to help others.
- **Escaping routine:** Starting a business provides an opportunity to break free from monotonous work routines and experience new challenges and variety. Peter, a corporate employee tired of the repetitive nature of his job, becomes an entrepreneur to pursue his interest in event planning, where each project brings unique experiences.
- **Contribution to the community:** Entrepreneurs can gain appreciation from the community by creating products or services that fulfill important needs. They can also contribute to the welfare of the community through sponsorships or philanthropic actions. Emma, an environmentally conscious entrepreneur, establishes a sustainable fashion brand to provide eco-friendly alternatives and support environmental causes.

However, involvement in business also entails risks and disadvantages, including the following:

- **Income uncertainty:** The success of a business can fluctuate, leading to uncertain income for entrepreneurs. Chris, a small business owner in the tourism industry, faces financial uncertainty during seasonal downturns.
- **Risk of losing invested capital:** Business failures can result in the loss of the capital invested, which may include personal funds. Rachel, an aspiring entrepreneur, takes the risk of investing her savings in a tech startup that ultimately fails, resulting in financial loss.
- **Burden of total responsibility:** Entrepreneurs bear the full responsibility for the success or failure of their businesses, with their decisions impacting not only themselves but also their employees, customers, and communities. Tom, a restaurant

owner, carries the weight of ensuring the satisfaction of his customers and the livelihood of his staff.

- **Career risk:** Entrepreneurship involves a certain level of career risk, as the success of the business can have long-term implications for the entrepreneur's professional trajectory. Anna, a marketing professional, leaves her stable job to start her own marketing agency, taking a risk that her business might not achieve the same level of success.
- **Frustration when seeking expert advice:** As entrepreneurs may not possess expertise in all areas, they may need to rely on experts, which can sometimes challenge their sense of independence. Michael, an entrepreneur in the tech industry, faces frustration when seeking legal advice to navigate complex intellectual property issues.
- **Deviations from ethics:** The pressures of running a business may lead some entrepreneurs to make compromises that deviate from ethical standards. Diana, a business owner in the food industry, faces the temptation to compromise on the quality of ingredients to cut costs, but must uphold her commitment to providing healthy and sustainable options.
- **Intense work schedule:** Especially in the early stages, entrepreneurs often work long hours, including weekends, without taking vacations or breaks. Latifah, the founder of a startup, finds herself working late nights and sacrificing personal time to meet critical deadlines and ensure the success of her venture.
- **Strained family relationships:** The demanding work schedule of entrepreneurs can lead to limited time spent with family members, potentially straining relationships. David, a business owner, struggles to balance his responsibilities at work with spending quality time with his children, causing strain in his family dynamics.
- **Impact on health:** The stress and demands of running a business can lead to psychosomatic illnesses, such as headaches, backaches, and stomachaches. Jessica, an entrepreneur in the fashion industry, experiences physical symptoms of stress due to the pressures of managing production timelines and meeting client demands.

Exercise: Satisfactions and Dissatisfactions Debate

Target audience: Students

Context: Students will be asked to engage in a lively debate to discuss and defend their viewpoints on the satisfactions and dissatisfactions associated with entrepreneurship. The exercise aims to encourage critical thinking, persuasive communication, and the exploration of different perspectives.

Task:

1. Divide the class into two groups: one group representing the “Satisfactions” side and the other representing the “Dissatisfactions” side.
2. Each group will prepare arguments supporting their assigned category. They should consider both general points and specific examples.
3. Conduct a structured debate session where each group takes turns presenting their arguments, responding to counter-arguments, and providing rebuttals.
4. After the debate, facilitate a class discussion to reflect on the key points raised and analyze the different perspectives presented.

Note: This exercise promotes critical thinking, effective communication, and the ability to consider multiple viewpoints. It challenges students to articulate and defend their arguments while fostering a deeper understanding of the satisfactions and dissatisfactions associated with entrepreneurship.

Exercise: Satisfactions and Dissatisfactions Reflection

Target audience: Lone readers

Context: As a lone reader, you’ll engage in a detailed thought exercise to explore the satisfactions and dissatisfactions associated with entrepreneurship. The exercise aims to encourage introspective thinking, effective writing, and the development of a balanced understanding.

Task:

1. Create two sections in your journal or in a document on your device: one titled “Satisfactions” and the other titled “Dissatisfactions”.
2. Under the “Satisfactions” heading, list the key satisfactions of engaging in business activities as outlined in the material. Next to each point, write a detailed reflection on how this satisfaction might apply to you and your personal aspirations. Try to include specific examples.
3. Under the “Dissatisfactions” heading, do the same with the listed disadvantages and risks of entrepreneurship. Reflect on how these potential challenges might impact you personally.
4. After reflecting on both lists, write a summary analyzing the balance between satisfactions and dissatisfactions. Include your own perspective on whether the potential rewards outweigh the potential risks.
5. Lastly, imagine a scenario where you have the opportunity to start your own business. Based on your reflections on the satisfactions and dissatisfactions, write a detailed pros and cons list to help decide whether to pursue this opportunity.

Note: This exercise promotes introspective thinking, effective written communication, and the ability to consider multiple viewpoints. It challenges readers to apply theoretical knowledge to their own context, fostering a deeper understanding of the satisfactions and dissatisfactions associated with entrepreneurship.

3.2 Defining motivation

Motivation refers to the set of motives, needs, tendencies, affects, interests, intentions, and ideals that underlie human actions, behaviors, and attitudes (Carsrud and Brännback, 2011). It serves as the driving force behind an individual's conduct, influencing their behaviors and guiding their actions. Motivation is a complex and multifaceted concept that plays a crucial role in determining the level of engagement, persistence, and success in various endeavors.

In the scientific literature, motivation has been studied extensively, leading to the identification of several widely accepted principles and theories. These theories recognize motivation as a continuous and dynamic process with three fundamental phases: triggering, acquisition, and fulfillment (Oosterbeek et al., 2010). The triggering phase involves the emergence of motives and needs that initiate the motivation process. The acquisition phase refers to the gathering of information, resources, and strategies necessary to pursue the desired outcomes. Finally, the fulfillment phase involves the attainment of goals and the satisfaction of motives, leading to a sense of accomplishment and well-being.

Motivation is influenced by a variety of factors, including individual perceptions and interpretations. Each person has their own unique way of perceiving the environment and the potential rewards or consequences associated with different actions. These perceptions shape their motivation and can lead to variations in behavior and performance even in similar situations. Additionally, motivation operates in a reciprocal relationship with external factors, such as needs, expectations, goals, efforts, and results. While motivation can drive behavior, it is also influenced by the presence of these stimulating factors, creating a complex interplay between internal and external forces.

Understanding motivation is essential in various domains, including education, business, sports, and personal development. In educational settings, motivation plays a critical role in student engagement, academic achievement, and lifelong learning. In the business world, motivation is key to driving employee performance, productivity, and job satisfaction. In sports, motivation influences athletes' commitment, effort, and goal attainment. On an individual level, motivation shapes personal goals, career aspirations, and overall well-being.

By comprehending the intricacies of motivation, individuals and organizations can harness its power to foster positive and productive behaviors. Strategies such as goal-setting, rewards and recognition, autonomy, meaningful work, and supportive environments can enhance motivation and contribute to personal and professional growth. Moreover, cultivating intrinsic motivation, which arises from internal factors such as passion, curiosity, and personal values, can lead to more sustainable and fulfilling outcomes.

For example, Jessica, our motivated entrepreneur in the fashion industry, is driven by her deep-rooted aspiration to make a positive impact on society through sustainable fashion practices. Her motivation stems from a combination of her personal values, the need to contribute to environmental sustainability, and her desire to create a successful business.

Similarly, Frank, an aspiring musician, is motivated by his passion for music and the fulfillment he derives from composing and performing his own songs. His motivation is driven by his love for music, the pursuit of artistic expression, and the goal of sharing his creations with others.

In both cases, motivation acts as the catalyst that propels Lisa and Frank to pursue their entrepreneurial ventures, even when faced with hurdles. Their individual perceptions, aspirations, and expectations shape their behaviors and guide their actions, leading them towards the fulfillment of their goals.

In summary, motivation is a multifaceted construct that underlies human behavior and actions. It is a dynamic process influenced by individual perceptions and external factors. Understanding motivation and applying strategies to foster and sustain it can have profound implications for personal and professional success.

4 Theories of motivation

4.1 Needs theories

Several theories have been proposed to explain motivation based on needs:

- *Murray's Theory* suggests needs are inner states that trigger behaviour towards certain goals (Ronstadt, 1987).
- *Maslow's Theory* categorizes needs into a hierarchical structure, starting with basic needs and moving up to higher ones (Ronstadt, 1987).
- *Alderfer's ERD Theory* distinguishes between existential needs (survival), relational needs (social connections), and developmental needs (personal growth) (Zlate, 1997).
- *Herzberg's Two-Factor Theory* identifies hygiene (external) factors leading to dissatisfaction and motivational (internal) factors causing satisfaction (Zlate, 1981).
- *McClelland's Achievement Theory* emphasizes the needs for achievement, affiliation, and power as motivational drivers, particularly for entrepreneurs and managers (Yonkers, 2004).

In short, these theories, combined with understanding the satisfactions and dissatisfactions of entrepreneurs, help to unravel the intricate dynamics of entrepreneurship.

Exercise: Sara's needs (Needs-Based Entrepreneurial Case Study)

Target audience: Any reader

Case Study Scenario: Sara is an aspiring tech entrepreneur who has recently graduated with a degree in computer science. She has developed a groundbreaking mobile app idea and is eager to transform it into a successful startup. However, she faces various challenges, including limited business knowledge, lack of access to funding, and the need for a supportive entrepreneurial community. Sara's goal is to build a scalable tech company that solves a real problem and creates a positive impact in society.

Task: Conduct a needs analysis for tech entrepreneurs like Sara in the given context. Identify the primary needs that entrepreneurs in the tech industry might seek to satisfy. Apply the various needs theories discussed in the chapter to support your analysis.

Guiding Questions:

1. What are the potential needs that tech entrepreneurs like Sara might have in terms of personal and professional development?
2. How can the theories of needs, such as Maslow's Hierarchy of Needs, Herzberg's Two-Factor Theory, and McClelland's Achievement Theory, help in understanding and addressing these needs?
3. Consider the challenges specific to the tech industry, such as rapid technological advancements, market competition, and access to funding. How do these challenges impact the needs of tech entrepreneurs?

Note: You can adapt the following to showcase entrepreneurs from various industries and backgrounds. Each case study could also highlight the satisfactions and dissatisfactions experienced by the entrepreneur.

4.1 Cognitive theories

Theories of motivation provide a vital framework to understand and guide the motivational drives of entrepreneurs. Among them, Vroom's Theory of Expectations, Porter and Lawler's model, Lawler's revision of the Expectancy Theory, and theories based on psychological balance offer critical insights.

- *Vroom's Theory of Expectations* states that individuals, as rational decision-makers, undertake activities with the expectation of achieving rewards (Bonciu, 2000). This theory is applicable to entrepreneurs who make strategic decisions based on their anticipated outcomes and the perceived value of those outcomes.
- *Porter and Lawler* built on Vroom's theory, arguing that effort does not directly translate into performance and highlighting additional influencing variables, such as the perceived probability of effort and reward, ability, and personality traits (Kuratko, 2005). This model can guide entrepreneurs to understand that successful outcomes are not merely the result of hard work but are influenced by a range of factors.

- *Lawler* further refined the *Expectancy Theory*, focusing on the connections between effort and expected performance, and performance and expected outcomes (Bonciu, 2000). This underscores for entrepreneurs that the level of satisfaction is determined by their performance, which influences their motivation and decision to continue or change their strategies.
- Lastly, *some theories* propose that motivation arises from attempts to maintain psychological balance. This is crucial for entrepreneurs, as they often experience stress and psychological imbalances, driving them to seek solutions to restore balance.

In essence, these theories highlight the role of rational decision-making, the perceived value of rewards, and psychological balance in driving motivational behaviors among entrepreneurs. They provide insights into how entrepreneurs can manage their expectations, strategies, and mental well-being in their entrepreneurial journey.

Exercise: Motivational Factors SWOT Analysis for Entrepreneurs

Target audience: Any reader

Task: You are going to conduct a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis focused on the motivational factors that entrepreneurs encounter. The objective is for you to identify and analyse the internal and external factors that can influence your motivation as a budding entrepreneur. Think critically about the different factors that can impact your motivational drive.

Here's how to proceed:

Strengths	Weaknesses
<p>1. Start with the Strengths section. Identify your personal strengths that could positively influence your motivation as an entrepreneur. Consider the following:</p> <ul style="list-style-type: none"> • What are your personal strengths or qualities that drive and sustain your motivation? • How does your passion, determination, or self-belief serve as a strength in your entrepreneurial journey? • Do you possess any unique skills or expertise that can contribute to your motivation? 	<p>2. Proceed to the Weaknesses section. Identify your personal limitations that could negatively influence your motivation. Consider factors such as:</p> <ul style="list-style-type: none"> • What personal challenges can impact your motivation negatively? • Are there any self-doubts, fears, or lack of confidence that can undermine your motivation? •Do issues like time management or work-life balance challenges affect your motivation?

Opportunities	Threats
<p>3. In the Opportunities section, identify external factors that could provide favourable conditions for your motivation. Consider:</p> <ul style="list-style-type: none"> • Are there emerging trends, market gaps, or supportive networks that can enhance your motivation? • How can access to resources, funding opportunities, or mentorship programs contribute to your motivation? • Are there industry developments or technological advancements that can positively impact your motivation? 	<p>4. In the Threats section, identify external factors that may pose challenges or threats to your motivation. Think about:</p> <ul style="list-style-type: none"> • Are there market competition, economic uncertainties, or regulatory barriers that can affect your motivation? • How can external factors like negative feedback, limited market demand, or resource constraints influence your motivation? • Are there social or cultural factors that can impact your motivation?
<p><i>Note:</i> Remember, this exercise can be adapted based on your specific needs and learning objectives. You might want to consider real-world scenarios related to entrepreneurship to further enrich your analysis. After completing your SWOT analysis, reflect on the identified factors, their interconnections, and their potential impact on your entrepreneurial motivation.</p>	

5 Personality characteristics related to the entrepreneurial mindset

5.1 Types of professional personality related to entrepreneurship

In its broadest sense, the term “personality” refers to the social existence and cultural characteristics of an individual (Popescu-Neveanu, 1996). Personality encompasses a collection of traits and tendencies that contribute to the similarities observed among individuals. These characteristics exhibit continuity over time and arise from various behavioral possibilities influenced by social and biological factors (Cherrington, 1989). Personality can be understood as the dynamic organization of an individual’s psychological and physical features, encompassing cognitive, affective, physiological, and morphological aspects. Studies conducted on professional personality, recognized across different cultures, have identified two major types, A and B, with an intermediate type, AB (Zlate, 1981).

- **Type A Personality:** Individuals with a Type A personality display an aggressive and intense involvement in any activity, perceiving it as a constant struggle against obstacles. They tend to work at a rapid pace, often setting demanding deadlines that require significant effort and extend their work and home schedules. Consequently, they may exhibit competitiveness, intolerance, and even aggression. Let’s consider John, an entrepreneur with a Type A personality. He is constantly driven to excel in his business and perceives it as a continuous battle against hurdles.

John sets aggressive targets and works tirelessly to meet challenging deadlines. He is highly competitive and is often seen pushing himself and his team to achieve outstanding results. Due to his intense drive, John can sometimes become impatient and intolerant of delays or inefficiencies in the workplace.

- **Type B Personality:** Individuals with a Type B personality remain calm and composed in various situations, not succumbing to time pressures or conflicts as easily as others. They possess energy and a strong sense of self-confidence, allowing them to approach their work in a peaceful manner, albeit at a sustained pace. Emily, a business owner, exemplifies a Type B personality. She approaches her work with a calm and composed demeanor, even in high-pressure situations. Emily does not get easily overwhelmed by time constraints or conflicts. Instead, she maintains a balanced perspective and tackles challenges with a sense of ease. Emily's self-confidence and ability to stay focused enable her to accomplish her tasks in a methodical and steady manner.
- **AB Personality:** The AB personality type represents an intermediate category, with individuals displaying attitudes and behaviors that fall between the characteristics of Type A and Type B personalities. Michael, another entrepreneur, exhibits an AB personality type. Michael can be driven and intense when working on critical projects, setting ambitious goals and investing significant effort to achieve them. However, he also recognizes the importance of maintaining balance and avoiding burnout. In less demanding situations, Michael adopts a more relaxed and laid-back approach, allowing himself time for reflection and rejuvenation.

Exercise: Personality Reflection and Self-Assessment

Target audience: Any reader

Objective: To encourage individuals to reflect on their own personality traits and characteristics in relation to entrepreneurship, and to gain self-awareness of how their personality may align with the professional traits and tendencies described in the chapter.

Task:

1. Reflect on your personality traits, behaviors, attitudes, and typical reactions in various situations.
2. Read the descriptions of Type A, Type B, and AB personalities as provided in the chapter.
3. Only for students: present to the class what type you are and provide arguments.

Note: Take this self-assessment as an opportunity to gain self-awareness about your own personality traits and their potential influence on your entrepreneurial journey. Understanding your personality type can provide insights into your strengths and challenges as an entrepreneur.

5.2 The entrepreneurial mindset: interactions between skills and attitudes

Skills refer to the mental and physical attributes that individuals develop through functional structures to successfully perform specific activities. They can manifest in various forms, such as vocation, talent, and genius (Oosterbeek et al., 2010). Vocation arises when individuals display a special inclination towards a particular activity, while talent emerges through the creative evolution of complex skills. Genius represents the highest level of skill development.

Professional aptitude is considered a combination of simple skills, influenced by knowledge, interests, and abilities. The attainment of professional skills occurs when general or intellectual skills, such as intelligence, memory, observation, and attention, are complemented by one or more specific skills, including technical or mechanical skills, psychomotor skills, sensory skills, organizational skills, and leadership skills (Kanevsky et al., 2017).

Attitudes, on the other hand, are complex phenomena that can exhibit a certain degree of ambivalence (Florin et al., 2007) toward objects, individuals, or situations. According to Popescu-Neveanu et al., the interaction between attitudes and skills can take four different shapes:

- Type I: This type involves a high level of achievement in both the attitudinal sphere and the corresponding level of skills.
- Type II: In this case, a high attitudinal level is accompanied by poorly developed skills.
- Type III: This type encompasses situations where attitudes are at a lower level, while skills are at a much higher level.
- Type IV: The amorphous type, where both attitudinal and skill levels are low.

These classifications help evaluate the relationship between attitudes and skills, considering their respective levels, interactions, and directions of influence.

Exercise: “Your Entrepreneurial Journey Map”

Target audience: Any reader

Objective: This exercise is designed to encourage you to self-reflect and increase your awareness about your potential and skills as an entrepreneur. It provides an opportunity for you to explore your entrepreneurial mindset in a structured manner, right from self-awareness to entrepreneurial effectiveness.

Task:

1. **Entrepreneurial Mindset Journaling:** Start by writing a journal entry that explores your current mindset. Reflect on your personal attributes and how they relate to entrepreneurship. Are you creative, resourceful, flexible, resilient, or curious? How do you handle uncertainty, risk, and failure? How might your personal values influence your approach to entrepreneurship?
2. **Reflect on Your Goals and Aspirations:** What are your personal ambitions and goals? As an aspiring entrepreneur, what do you hope to achieve? What kind of business or venture would you like to create? What values and impact do you hope to embody through your entrepreneurial activities?
3. **Identify Your Capabilities and Areas for Growth:** Create a list of your current skills, experiences, and networks that could help you develop opportunities in entrepreneurship. Also, identify areas where you lack knowledge or experience and outline ways you could develop these capabilities. This could be through further study, networking, finding a mentor, or gaining practical experience through work placements or volunteering.
4. **Visualise Your Success:** Now, create a vision board or mind map that represents your 'ideal' entrepreneurial journey. This should include the goals you want to achieve, the skills you want to develop, the networks you hope to create, and the impact you aspire to make. This visual representation should be something you can refer back to and update as you progress in your journey.
5. **Create Your Roadmap:** Next, outline a roadmap to entrepreneurial effectiveness. This roadmap should outline the steps you plan to take to achieve your goals, develop your capabilities, and become effective in your entrepreneurial activities. This could include specific milestones, such as completing a course of study, securing a mentor, or launching a pilot project.
6. **Regular Reflection and Reassessment:** Remember to revisit your journal, vision board/mind map, and roadmap regularly. Reflecting on your progress and reassessing your goals and plans is a crucial part of your entrepreneurial journey.
7. **Acquire Resources:** As an extra step, you can research online resources such as e-learning activities, training sessions, and online networks that could provide valuable support in your journey. You can include these resources in your roadmap.

Note: Remember, this exercise is a personal journey of self-discovery and growth. There's no "right" or "wrong" way to approach entrepreneurship, and your path may change many times along the way. The goal is to foster self-awareness, planning skills, and the confidence to take action towards achieving your entrepreneurial dreams.

Exercise created based on Quality Assurance Agency for Higher Education, 2018

5.2 Creativity – the entrepreneur's creativity side

Creativity is the process of creating something new and unique, moving away from conformity and conservatism. This process is inherently risky, challenging the known and

familiar. It is understood that creativity can exist in any field or profession, with different degrees of intensity, and is closely related to talent.

In psychological terms, creativity encompasses three main concepts: creative behavior and mental activity, the structure of a creative personality or style, and group creativity.

The bipolar model of personality, developed by Popescu-Neveanu et al. (1996), provides a framework for understanding creativity. This model identifies two factors: 'Vectors' which drive action and orientation (including needs, motives, goals, aspirations, and attitudes), and 'Operations and operating systems' which relate to processes of thinking and aptitude.

Within this model, certain vectors are identified as key to creativity, including a need for growth, improvement, and achievement. They enable non-conformist attitudes such as self-belief and a drive towards self-realization, cognitive interest in chosen fields, a critical and open attitude towards experiences, courage to adapt to new and unconventional goals, perseverance in the pursuit of new solutions, and an appreciation for novelty and originality. More detailed analysis of these topics is addressed in the chapters dedicated to creativity.

Exercise: Exploring Creative Attitudes and Behaviors

Target Audience: Students

Context: Students will explore and understand the various creative attitudes and behaviors that contribute to the act of creation and the development of a creative personality.

Task:

8. In small groups, discuss and identify real-life examples of individuals known for their creative achievements in different fields, such as arts, science, technology, or entrepreneurship.
9. Based on the provided descriptions of creative attitudes, analyze how these individuals demonstrate the specific attitudes and behaviors associated with creativity.
10. Prepare a short presentation showcasing the examples and highlighting the creative attitudes and behaviors exhibited by each individual.
11. Present your findings to the class, discussing how these individuals embody the different aspects of creative attitudes and how their behaviors have contributed to their creative accomplishments.

Note: This exercise allows students to explore and recognize the diverse expressions of creativity in various domains. By analyzing real-life examples, students can gain a deeper understanding of the attitudes and behaviors that foster creativity and innovation.

6 Conclusions & main learning points

The concept of entrepreneurship is multifaceted and encompasses various definitions and perspectives. It involves individuals who initiate and carry out action, assume risks, and demonstrate innovation in creating new combinations of existing elements. Entrepreneurs derive satisfaction from controlling their own destiny, reaching their maximum potential, unlimited earnings potential, job security, reinvesting accumulated capital, applying their knowledge and skills, escaping routine, and contributing to the community. However, entrepreneurship also presents challenges, including income uncertainty, the risk of losing invested capital, the burden of total responsibility, career risk, frustration when seeking expert advice, deviations from ethics, an intense work schedule, strained family relationships, and the potential impact on health.

Motivation plays a crucial role in entrepreneurship, driving individuals to pursue their ventures and persist in the face of challenges. Motivation can be influenced by various needs theories, including Murray's Theory, Maslow's Hierarchy of Needs, Alderfer's ERD Theory, Herzberg's Two-Factor Theory, and McClelland's Achievement Theory. These theories highlight the importance of fulfilling needs, setting goals, and attaining rewards as motivators for entrepreneurial behavior.

Personality characteristics also impact the entrepreneurial mindset. Type A, Type B, and AB personalities exhibit different attitudes and behaviors toward entrepreneurship, with Type A individuals being driven and intense, Type B individuals being calm and composed, and AB individuals falling between these two extremes.

The interaction between skills and attitudes further contributes to the entrepreneurial mindset. Individuals with a high level of achievement in both attitudes and skills are likely to excel in entrepreneurship, while those with a high attitudinal level but poorly developed skills may struggle to translate their positive attitude into action. Conversely, individuals with lower attitudinal levels but highly developed skills can still succeed in entrepreneurship. The interplay between attitudes and skills determines the effectiveness and outcomes of entrepreneurial endeavors.

Creativity is a key aspect of the entrepreneurial personality. It involves the production of something new and is intertwined with risk-taking and non-conformist behavior. Creative personality traits, including confidence, cognitive interests, anti-routine attitudes, adaptability, perseverance, and appreciation for novelty, contribute to the entrepreneurial mindset and facilitate innovative thinking and problem-solving.

In conclusion, entrepreneurship is a complex and dynamic field that encompasses various aspects of motivation, personality characteristics, and creativity. Understanding these factors can provide valuable insights into the attitudes, behaviors, and motiva-

tions of entrepreneurs, ultimately influencing their success in starting and growing businesses. By recognizing and harnessing these elements, individuals can cultivate an entrepreneurial mindset and navigate the challenges and opportunities inherent in the entrepreneurial journey.

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Theme 4

Social, community, and
collective learning for
creativity and enterprise

Chapter 4.1

Communities of practice and creativity

Abstract:

In the current chapter the role of creative and innovative processes in communities of practice (Wenger, 1998) are discussed. Communities of practice require trust among their members, the use of a shared repertoire of meanings and finally a common goal. Creative processes and knowledge sharing are social phenomena among members of each community: new ideas or artifacts arise from the synergy of many sources and not only from the mind of a single person. The communities of practice are the ideal environment for the development of original and valuable ideas. The application of technologies could be a useful support for promoting the interaction and for facilitating what is called “tacit knowledge”, knowledge that is easily made in common through the narration of practices and experiences. Moreover, it is important to consider the conditions because very often creativity emerges spontaneously if the members of the community perceive that their proposals are listened to. The perception of a friendly and supportive environment where they can freely talk about their feelings and life stories, thus stimulating motivation and the pleasure to share are core aspects and conditions. Linking the subjects of community of practices and creativity could be considered valuable also for a wide context inducing outcomes that are generalizable.

Keywords:

communities of practice, virtual creativity, online innovation, knowledge management, knowledge creation

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1 Introduction

The communities of practice theory offered new inputs to education valuing the role of knowledge sharing and collaboration. Communities of practice are perfect settings for the development of innovative and helpful ideas. Knowledge sharing and collaborative creativity are social processes among members of the community of practice, where new ideas or artifacts are carried out from the interaction of many sources and the collaboration of participants.

The application of technologies could be a useful support for promoting the communication and for facilitating the exchange of “tacit knowledge”. Tacit knowledge is knowledge shared informally through stories of experiences, tools, ways of solving problems and essentially common practices. However, the simple availability of technology is not a sufficient condition for obtaining satisfactory results: very often creativity emerges spontaneously if the members of the community perceive that their proposals are welcomed and appreciated. In addition, emotional features are important: the perception of a friendly and supportive environment where participants can express their-self communicating their feelings, are fundamental characteristics.

The objective of the current chapter is to improve the understanding of the links between communities of practice and creativity by scrutinizing their main characteristics and features. Communities of practice require trust among their members, the use of a shared repertoire of meanings and finally a joint objective. We also sought to define applied indications for creativity development to improve work inside the communities of practice. The theoretical framework for this chapter refers to the theory of community of practice, online technologies and community of practice, the process of sharing experiences and the role of tacit knowledge in a community of practice. Communities of practice are discussed considering elements such as collaborative learning and knowledge management processes. In addition, issues of technologies and creativity and the role of the individual and the group in the community of practice and creativity are discussed. Finally, learning exercises are proposed.

2 Community of practice

The community of practice construct was developed over time around a conception of learning as a social, active and situated practice (Lave, & Wenger, 1991; Wenger, 1998). The community of practice is based on the term “practice” which involves sharing experiences developed “on the field”. The practice could be elaborated in several areas and with different activities and they affect the cognitive systems. Therefore, practices and

cognitive systems are not easily separable and are reproducible abstractly. Practices and cognitive systems have always been interpreted specifically in the context in which they operate. Communities of practices (CoPs) are also communities of learning because several learning processes are activated in an informal dimension. The most important characteristics of the communities of practice are summarized in the following three elements:

1. a *mutual commitment*, based on trust to share and discuss their experiences with other members of the community;
2. the recognition and use of a *shared repertoire* of languages, meanings, artifacts, stories, methods and tools, and finally;
3. *participation in a joint venture* that activates community resources, whether they are experts or beginners.

However, Wenger's definition of community is not idealized. Mutual commitment and trust have to be earned from time to time with efforts and engagement with practical activities in the field and connotations of peaceful coexistence and mutual support are not taken for granted, even if they can definitely exist in certain cases (Wenger, 1998).

From these founding elements, other characteristics highlight the complex network of relationships and identities between the experienced and less experienced members of the community. The internal processes that lead to "legitimate peripheral participation" are processes through which novices - with the time and with the help of all members - are able to learn knowledge and skills. The learning process involves the management of the transition of the novices from a "peripheral" status to a more important and "central" one, in which they become experts themselves. A strong emphasis on sharing "practices" and "reification" of concrete artefacts, located and strongly anchored to various professional contexts was considered.

3 Online technologies and community of practice

New technologies and the Internet have enlarged the potentials for social interactions extending the interactions between the members of a group or community committed to create a shared knowledge. Social networks and the flourishing of online communities of practices expanded what we could call interactive learning through community and technology growing the opportunities of sharing ideas, skills and projects (Kenny, 2013). With the support of media technologies, the emphasis is moved to the collective rather than the singular dimension and group work is one of the crucial abilities for working and developing entrepreneurship projects. Virtual communities of practice could take advantage from members from all over the world having diversity for back-

ground and cultural, social practices. Affiliates provide and obtain suggestions and help from the other members of the community of practice they participate inducing an enlargement of skills and competencies.

However, it could be argued that the use of online technologies is not an equally effective method to substitute face-to-face interactions because, for the development of the community of practice, it is important to adequately support the sharing of tacit knowledge. Tacit knowledge is knowledge that is difficult to achieve through verbal medium or only by words as it involves skills and competencies.

The degree of cohesion of a community is based to the common moments of physical presence. However, virtual communities can equally exist also if they develop online interactions. The distinction between communities of practice and networks of practice has therefore been proposed (Lai et al., 2006). Unlike those of practice, the practice networks represent a set of people who are not strictly connected where there are hardly, or never, opportunities to meet in person and are kept cohesive especially by relational flows mediated by the technologies used. The development of any community could be eased on two different connotations: it could be born as a group of co-localized people, then supported by online relationships or maintaining only virtual contacts with members that are geographically spread out.

However, online CoPs are more difficult to create and maintain than face-to-face CoPs because regular intervals and face-to-face meetings that strengthen emotional ties and trust are needed. Furthermore, online CoPs differ in other important factors, such as membership processes. For example, online CoPs are generally open, while those with strong connotations of co-localization are much less permeable and more time for their growing and developing is needed. It takes much longer for an online CoP to born and to stabilize compared to a face-to-face one. As evidence of the importance attributed by the literature on the subject, survey tools have also been developed and applied to the online CoP, including for example the Sense of Community Index (SCI, Abedin et al. 2010). SCI measures individual's sense of cohesion and awareness of others and was developed for supporting a better understanding of sense of community in computer supported collaborative learning environments. An additional tool developed for assessing the group processes is the group metacognition scale (GMS) that measure group metacognition in online collaborative learning (Biasutti & Frate, 2018). Online platforms involve collaborative learning activities and communication between participants and reflecting on the perceived images of the other member of the group is a relevant process.

4 Sharing experiences in a community of practice: the role of tacit knowledge

The members of a community are practitioners that develop a shared set of resources: stories of experiences, tools, ways of solving problems and essentially common practices. For this reason, the simple sharing of information or raw data are not practices and shared knowledge. The literature on the subject makes a distinction at the epistemological level between two types of knowledge: the tacit and the explicit (Polanyi, 2009). While explicit knowledge is easily transmitted, for example through texts, diagrams, formulas; conversely, tacit knowledge is much more difficult to communicate and share and often has to be shown concretely in the field. The bicycle is the example quoted by Polanyi: we are perfectly able of riding a bicycle with our body, but we are unable to communicate the “rules” explicitly and clearly to another person who has to learn to ride.

A huge set of skills and competences typical of every human activity are difficult to formalize in a clear and complete way. The bike example immediately gives you the idea of the specific field of “embodied” knowledge. Both types of tacit and explicit knowledge are useful for problems solving and have to be considered not separately but in a continuum of complementary interaction between them (Nonaka, & Von Krogh, 2009). Tacit knowledge, as it moves along the continuum to become more explicit and therefore more easily communicable, is enriched with new terminologies, and can become the support for action and reflection and systematization in articulated and formalized structures. This process of “conversion” (Nonaka & Takeuchi, 1995) is essentially a social and situated activity: we always acquire and exchange tacit and explicit knowledge especially when we are engaged in targeted and intentional social practices (Wenger, 1998). It is interesting to note that some of the preferred ways to communicate tacit knowledge are storytelling, written tale, oral tale, drawing or videotaped story, of personal experiences that involve both the cognitive and the emotional spheres (Orr, 2016; Prusak et al., 2012; Petrucco, 2014).

5 Community of practice and creativity: the role of the individual and the group

Learning and creative processes within a community of practice are a social phenomenon and occur when:

- concrete activities are conducted;
- all members participate;

- the meaning of the activities and the results obtained are shared among all members.

Communities of practice principles (Wenger et al., 2002)	Related creative procedures
1. Design for evolution	Initiative: imagining possibilities, novel situations
2. Open a dialogue between inside and outside perspectives	Knowledge creation: sharing and developing ideas
3. Invite different levels of participation	Knowledge creation: interactions and dialogue
4. Develop both public and private community space	Knowledge creation and creative outcome
5. Focus on value	Creative outcome: quality
6. Combine familiarity and excitement	Knowledge creation: expanding and exploring knowledge
7. Create a rhythm for the community	Creative process: initiative, knowledge creation and creative outcome

Figure 1. The creative processes in a CoP. Taken from Swirski, Wood & Solomonides (2008).

Very often creativity emerges spontaneously if the members of the Community perceive that their proposals are listened to and they can freely talk about of their feelings and life stories, not only about their problem solving skills, thus stimulating motivation and the pleasure to share. Amabile (1996) argues that creativity is understood as the production of original and useful ideas as well as creative thinking and expertise, which necessarily implies the motivation to create and share. The procedures through which the communities of practice implement creative processes are multiple. Figure 1 reports some of the most important aspects related to creative procedures.

Several activities could be relevant for developing creative processes in a CoP. For example, the design for evolution could be activated by involving procedures such as imagining possibilities and defining innovative situations and applications in specific areas. While defining the situation one issue could be to connect and establish a dialog between inside and outside perspectives activating knowledge creation through sharing and developing new ideas. Participation could be involved at the different levels of knowledge of creation such as developing interactions and dialogues, which could be composed of both public and private dimensions. There could be a focus on the value and the quality of the outcomes and internal feedback and assessment could be relevant processes.

Creativity has to represent something new, but “innovativeness” is not enough: being creative is a social fact and it means creating something perceived as “appropriate” and useful by the whole community. This therefore happens when it is the result of joint efforts: as Csikszentmihályi (2009) argues: “An idea or product that deserves the label ‘creative’ arises from the synergy of many sources and not only from the mind of a single person”. The CoPs are the ideal environment for the development of new and useful ideas. Conversely, the organizations are less flexible than the communities are and tend to suppress creative processes, blocking them within rigid hierarchies and formal structures. Figure 2 shows creativity as a product of the dynamic interaction among three dimensions: the individual, the domain, and the field (Csikszentmihalyi, 1999): the CoP is the place (i.e. field) where ideas can be understood, discussed and realized.

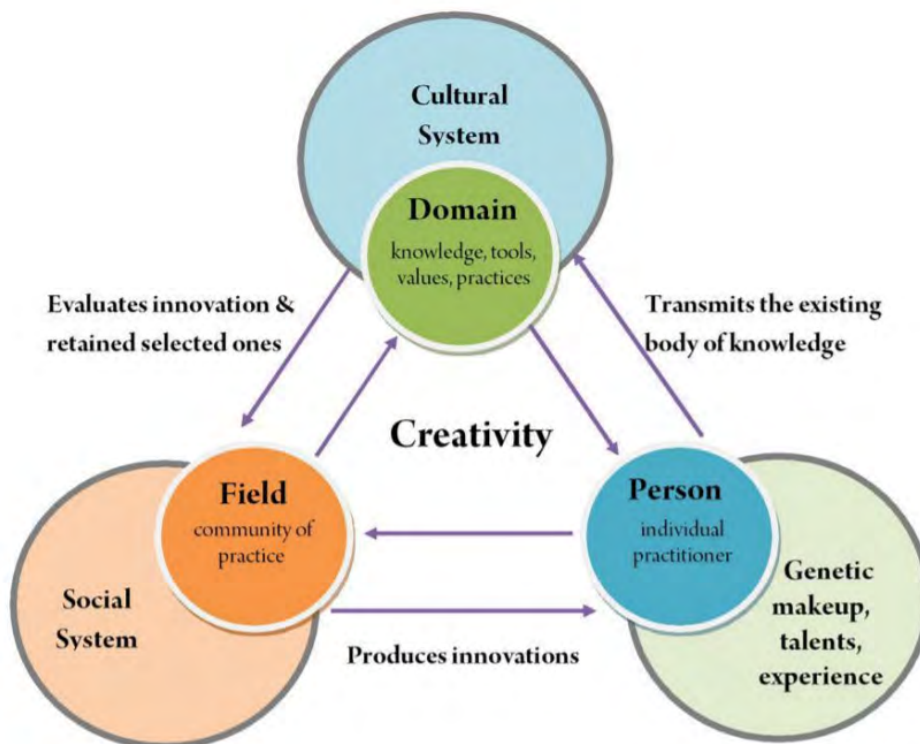


Figure 2. General Systems Model of Creativity, and the important role of the CoPs (Csikszentmihalyi, 1999).

A special focus could be done on the collective dimension. We could argue that the idea of the single researcher who alone creates innovation has always been a myth: the human mind is limited and has always the need for external support from its peers to find innovative solutions applicable to his/her community and possibly to the whole society (Hennessey & Amabile, 1999).

The most important scientific innovations have always been the result of joint efforts around a problem in a process that often lasted decades if not centuries and which involved thousands of people at various levels of participation, but nonetheless all important. We can therefore affirm with Engeström (2001) that creative processes do not take place only in people's minds but are always inserted in a specific socio-cultural context. In addition, each individual necessarily interacts in a social system that has complex cultural, ideological and historical components (Thibodeaux, 2014).

Innovative ideas need to satisfy two requirements, namely "social evaluation" and "social appreciation", in order to be accepted and implemented inside the communities of practice:

1. a "social evaluation" or a process in which several people with different backgrounds and intentions can understand them, reflect on them and possibly propose improvements, and
2. a "social appreciation" within a community, which demonstrates appreciation of their efforts and recognizes them as innovators, rewarding and motivating them to engage in new creative activities.

Social evaluation and social appreciation are relevant processes for the effective work of the communities of practice. Social evaluation involves reflection, mutual understanding in a friendly context in which all the members feel free to interact and to contribute. Social appreciation is based on respect and collaboration and is the fuel contributing to the well functioning of the communities of practice. Participation develops the feeling of affiliation in a process in which all the contributions and interventions of the participants are recognized and considered relevant.

6 Communities of practice and collaborative learning

Collaborative learning is activated inside the communities of practice facilitating the exchange of concepts, information and materials. Participants co-operate constantly with other members, and the group reach a significant level of coordination to achieve high-level learning objectives. Collaboration involves management and regulation of activities and processes such as peer review are supported. Several practices could adjust and enhance group learning because teamwork involves the use of strategies for controlling the progress of the activities and regulating the group processes. Continuous feedback during actions guarantees improvement and communities of practice participants have to be able to evaluate the strengths and the weaknesses of their collaborative work (Biasutti 2011), and to assess the abilities and the competencies of their teammates. Effective collaboration requires skills such as reflection on the group

activities and awareness about the cognitive potentialities of the group. Metacognition could be considered in a group dimension and it is a significant concept for understanding collaborative processes. Metacognition of groups could be based on their knowledge of cognition, planning, monitoring and evaluating (Biasutti & Frate, 2018). Metacognitive skills have a relevant value for controlling the cognitive dimension during the performance of a task.

7 Communities of practice and knowledge management processes

Knowledge management could be defined as the process of creating, capturing and using knowledge to enhance organizational performance (Biasutti & EL-Deghaidy, 2012). Inside the communities of practice, several knowledge management processes could be activated as reported in the model by Biasutti & EL-Deghaidy (2012) which is based on the following five constructs: knowledge acquisition, knowledge creation, knowledge internalization, knowledge application and knowledge sharing.

Knowledge acquisition regards the strategies and tools that could be applied to find information. Several tools and places could be utilized for knowledge acquisition including search engines and databases.

Knowledge creation begins with the collection of existing knowledge, ending with storage process and passing by processes of coding and classification of knowledge. The need for a networked community to help the transformation of tacit knowledge into explicit knowledge collectively is part of the community of practice activities. The production and creation processes emphasize the dynamics of transforming the tacit/explicit interplay into novel products. During knowledge creation knowledge with similar characteristics are linked and clustered which could be a stimulating point of departure for creative inspiration.

Knowledge internalization regards linking the information that has been found and accessed into previous mental schemata. Knowledge internalization refers to how knowledge is stored and organized influencing the changes in content and meaning of the individual's tacit knowledge.

Knowledge application is the stage where new opportunities for the community are created by seeking inventions, exploring and mastering the new rules. It is the process of applying what one has learned in a specific context to other situations transferring knowledge and procedures.

Knowledge sharing regards the dissemination of knowledge that can provide the necessary knowledge to a larger community. A special emphasis is posed on the social aspects such as trust, mutual respect, and community recognition that could help ‘sharing’ become effective. Communities of practice and learning communities present two of the most common examples, where the social aspects of knowledge management could happen. Within a community, members share experience and exchange tacit and explicit knowledge. Sharing and exchanging ideas are activities that push members of a community to question and make sense of their experiences.

8 Creativity and the importance of connections between different communities of practice

Communities of practice often generate innovative ideas when one or more of their members are in turn part of other CoPs. Members are often bringers of new knowledge and practices because they find spontaneous to apply them to the new contexts of other communities. For example, a dentist, who is a member of his community of dentists, but at the same time also of a community of aeromodellers, may find it natural to propose to use a micro-motor of the drill that he uses to solve the problem of weight and efficiency for fly a model aircraft at its best. The community of model aircraft finds this creative and innovative suggestion, while instead the micromotor for the community of dentists is an artifact already well known and applied in the context of drills for dental care. It is interesting to consider that in this case the micromotor is a so-called “boundary object”, that is an object that is flexible enough to adapt to the needs of different contexts but at the same time always maintaining its own specific identity (Star & Griesemer, 1989).

9 Technologies and creativity

As we have seen, the creative ideas and artifacts, that are their concretization, always arise in a social and cultural context but above all, also in a technological one: every cognitive process can be interpreted according to the concept of “distributed cognition” (Seel & Winn, 2012), in which three factors play an important role:

1. the external technological artifacts;
2. the internal conceptual artifacts;
3. the interrelationships with other people and with the culture of belonging.

Several scholars (Biasutti, 2015a; 2015b; 2018; Biasutti & Concina, 2020) suggest that

technological artifacts could provide a valuable support in the creative process by facilitating collaborative practices, such as brainstorming, developing and sharing ideas, or in facilitating communication to give and receive feedback.

Technologies are therefore useful in terms of inter-personal communication for sharing artifacts (texts, images, videos, etc.) but also for their realization. Several platforms offers support and tools, which we can range from the simplest ones, such as online forums, to more advanced ones, namely wikis or complex systems of knowledge management (Biasutti, 2017).

However, the use of technologies to share new ideas should never be taken for granted. Therefore, the availability of the technology is not a sufficient condition: as we have seen, it depends on the culture and climate that is established among people involved in any collaborative activity (Bourhis. & Dubé, 2010). In many professional contexts, sharing new ideas or solutions to problems can be perceived as a loss of a competitive advantage that you have or even arouse the fear of exposing yourself too much and being criticized by others. In conclusion, to foster creative processes it is important to be part of a community, to find the motivation to share and try to use the most suitable technologies.

10 Recommended Learning Exercise

To exploit fully the opportunities offered by communities of practices for the development of creative skills, it is important to reflect on these issues and trying to answer these questions:

1. On the basis of the definition given in the first paragraph, please think about how many and which communities of practice you have been part in your professional and/or private life. Did they meet all three requirements of mutual commitment, shared repertoire and participation in a joint venture?
2. Please, reflect on: how does this community of practice work? How does it encourage creativity between its members? Refer to the creative processes in Figure 1 for example.
3. How does the community usually evaluate and appreciate the innovations proposed by its members?
4. Knowledge about artifacts and processes is shared within each community of practice, but how is explicit knowledge shared and how is tacit knowledge shared?
5. How could you introduce the ideas about communities of practices to help develop social creativity in a group?

11 Conclusion

This chapter aimed to explore the factors and the links between communities of practice and creativity, considering their main characteristics. Several aspects emerged such as the importance of collaboration and the need to establish a friendly environment inside the communities of practices. Some features could be clarified such as how creativity could be enhanced and stimulated, justifying that further studies are needed in the context of communities of practice and creativity. Furthermore, a comprehensive examination could consider all emerging variables such as motivation, self-efficacy, beliefs about specific topics and activities, professional experience—whether professional or personal—as possibly related to the development of creativity inside the communities of practice. In addition, a model of creativity inside the communities of practice could be developed for providing inputs to educators for enhancing their pedagogical practices. Helping participants of the communities of practice to develop their creativity in a positive and genuine environment could sustain them in successfully facing the challenges of their professional lives.

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Chapter 4.2

Creativity Is Plural As Well As Singular

Abstract:

This book chapter is an introduction to plural and social creativity, for educators, learners and people who are interested in enhancing their shared creativity. It is intentionally written to be readable and accessible in style, and to prompt your creative thinking, working and collaboration.

Creative ideas can both originate and develop through shared social insights as well as individual imaginations. Appreciating this can enable people who may not see themselves as personally creative to contribute more than they might think to creative processes.

Prospective imagination features in creative entrepreneurship: how can individual and collective imaginations and intelligences be utilised to create future scenarios, experiences, artefacts and realities?

Structuring foresight, anticipatory systems, memories and novel insights are ingredients for a creative learning process drawing on shared ideas and other resources.

Keywords:

Creativity; imagination; innovation; collective intelligence; foresight; anticipation; narratives;

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Chapter Structure:

1. Introduction and purpose of the chapter
2. Explaining the structure
3. Why does social creativity matter?
 - 3.1. Forms of social creativity
 - 3.2. Digital and non-digital creativity
4. Structuring creativity – the IDEA loop
 - 4.1. Imagining – generative thinking
 - 4.2. Developing ideas – engaged working
 - 4.3. Evaluating possibilities – analysing and choosing
 - 4.4. Acting – making and implementing plans for innovation
5. Rethinking creative places
6. Taking action for creative learning – reflecting on your learning
7. References & further readings

1 Introduction and purpose of the chapter

This book chapter is about how we can learn to work creatively. It is written for educators and learners to use as a resource in thinking, experimenting and developing their creative skills. The chapter positions creative working as an essential set of activities which provide both innovation and entrepreneurship with a feedstock of ideas and possibilities.

There is a vast library of books, articles and other resources for creativity, and time spent investigating these is always likely to yield some useful ideas, theories, models, examples and techniques, as listed in the reference section.

This chapter proposes that creativity as not only an individual capability, but a shared one. Creativity is not only single, but also plural. That is significant, because in both education and in undertaking shared endeavours of creativity, innovation, entrepreneurship and social change, social creativity is essential – and is a capability which can be learned, even by people who do not think they are personally creative. Yet the ‘discourse’ of creativity mythologises the archetype of the lone genius. They do exist, but creativity actually requires social organisation – teams, collaborations, and helping as well as inspiring. We even teach ‘creative leadership’ which can help people facilitate social and group creative energy.

Learning outcomes:

By reading this chapter and completing the learning tasks, the learner is intended to be able to:

- Differentiate critically between ideas, concepts and terms in the creative discourse;
- Appreciate and enhance both personal and social creative behaviours;
- Apply generative, divergent and convergent thinking processes and models;
- Work systemically through a reflective creative process;
- Appraise and develop designs to enhance the creative quality of spaces;
- Reflect on their own creative skills and development.

2 Explaining the structure

The structure of this chapter is designed to make it easy for learners and educators to use. There are tasks included as thinking and learning activities. These are intended for individuals or small groups to use in reflecting, generating and developing ideas. Educators can adapt and add to these for inclusion in their own learning programmes. We do not teach creativity, so much as to shape an encouraging and supportive environment and culture in which people can think, act and learn creatively.

Following this introduction, section 3 explains what plural or social creativity is, and why it matters. It refers to supporting theories in creativity, learning and cognition (via neuroscience). The range of different forms through which social creativity is expressed is outlined. The relationships between creative working which uses digital technologies, and non-digital creativity are explored. This explains why over-use of digital devices can inhibit rather than assist creativity, whilst digital technology also provides a range of useful creative tools.

Section 4 introduces a simple creative model – IDEA – as an organising structure for the following sections of the chapter. There are many creative models. IDEA includes the four capabilities of 'Imagine, Develop, Evaluate and Act' on ideas. Being simple, it is easily memorable, yet is highly flexible and can be extended and adapted in many situations. The four capabilities are each explored and creative learning tasks are suggested for using them to develop both individual and interpersonal creative skills.

Section 5 shows how social creativity can be used to develop and shape creative places. There are examples and methods for making a place a more creatively stimulating and enjoyable space. This can be applied and developed from very small, shared spaces, and upscaled to include districts and even entire towns and cities. Social creativity is about designing and producing the environment where ideas can take shape and be expressed.

Finally, section 6 draws together the main ideas and techniques from the chapter to recommend how readers can take action to advance their own learning, to achieve results with and through other people. These can be used both by learners, and by educators working as facilitators with groups in educational, community, or informal settings.

In reading and working through the chapter, you will find tasks, exercises, activities and questions. All of these are intended to encourage and help you develop your creative learning. You will need to keep a notebook or log of your work on this chapter. Don't just read and think – you won't remember or have anything to review at the end. So write down your notes and draw sketches and maps! An A5 or A4 notebook or sketchpad with plain paper, or a tablet or iPad with 'pages' you can write and sketch on are ideal for this. It could be that you already have an idea, problem or project to work on for this chapter.

3 Why does social creativity matter?

Think back to any live musical or dramatic performance you have attended. The musical or theatrical genre isn't important. It could have been a classical, rock or hip-hop gig; an opera, ballet, a Shakespeare play or a comedy show.

Who were the creators? Was it only the individual composer, songwriter or playwright? Or was the performance actually realised through the co-creation and teamwork between all the performers, supported maybe by skilled lighting, sound, staging and promotions workers?

Very often, we recognise and celebrate the individual creative 'genius', such as Beethoven or Kurt Cobain, but neglect the team of creative people whose skills are essential to realising the expression of the work, not simply as a replication, but as a performance which adds a new dimension to the original composition. This is not confined to performing arts – great sporting teams performing at their best have a creative flow and synergy between their players which is a thrill to watch.

So, creativity requires not only having original ideas, but combining many imaginative, interpretive and practical skills to express them. Let's think for a moment what we mean by creativity, and related terms, in this socially connected way.

Task:

There is a set of terms below. What definition would you give for each of them.? Can you think of an example for each one?

Definitions:

- Creativity
- Co-creation
- Creative teamwork
- Creative enterprise
- Innovation
- Social innovation

Here are some simple definitions to compare with yours:

Creativity – associating ideas and resources to form a new or original concept, combination or artefact

Co-creation – combining with other people on a shared project of new work

Creative teamwork – a group organising for original or innovative work

Creative enterprise – an organisation with the aim of developing original or innovative production

Innovation – the application of creative work to provide value and benefits to users

Social innovation – providing societal and possibly non-financial value for users

Compare your responses - how different were yours from these?

Creativity thrives on diversity, so there are many different ways of expressing similar ideas, and your responses may be similar, or different, from these definitions, using your own words.

Read your responses, then see how often social interaction between people occurs in them.

Task:

Do you think that creativity is:

- mainly singular (by lone individuals)?
- mainly plural (by people working together)?
- Both singular and plural?

Can you think of examples of each of these?

3.1 The background to social creativity

The Hungarian psychologist Mihaly Csikszentmihalyi (1996: 1) said that “an idea or product that deserves the label ‘creative’ arises from the synergy of many sources and not only from the mind of a single person”. This is a systemic approach to creativity, in which creativity is not only an individual event, but requires a pre-existing cultural environment that provides opportunities for implementing novel ideas or innovations. Whilst individual creativity is always required, it needs the ‘synergy of many’ to realise it. Social participation and organisation are required as much as individual imagination. Individuals need to see benefits of their participation and the culture, environment and organisation needs to encourage and support collective creativity (Fischer et al, 2005).

Csikszentmihalyi defined creativity as a process by which a ‘symbolic domain’ in the culture is changed. A symbolic domain could be a genre of music, literature, film or any cultural field. It has a language or discourse with norms, rules and forms in which innovation can take place and be recognised. He set out three systemic conditions for creativity:

- A culture with symbolic rules
- A person bringing novelty into the symbolic domain

- Experts who recognise and validate the innovation

So, the creative act, or innovation, changes the culture or its rules in some way; possibly it bridges more than one domain, or even creates a new one. And the 'rulemakers' must accept the innovation – often reluctantly or eventually! He went on to invent the notion of 'flow' as creative working.

Let's take Black American music as a domain. This originated with traditional music being imported by people captured as slaves from African countries. Musicians from many countries such as Mali and Ghana today still play and develop contemporary African music, including these recognisable forms. In North America, and the Caribbean, these folk traditions became work songs on the plantations and intermingled with other music traditions, such as Celtic folk music and dance, French Acadienne, classical and Eastern European, and more. The industrialisation of the twentieth century brought this music out of the cotton fields in the migration to the cities and led to jazz and blues performers, bands, and a recording industry being created. The soul, jazz and blues lineage can be traced through many innovators to the development of R'n'B (a term which has changed hugely), hip-hop, rap and many new sub-genres of music. Beyoncé Knowles played the singer Etta James in the film 'Cadillac Records' (2008) which portrayed how the blues recording industry developed in the mid-twentieth century, and it continues to thrive today (Cohen, 2004).

Task:

Can you think of a musician, performer or producer who has changed this culture?

How, and what was their innovation? There are many examples!

Miles Davis, the jazz trumpet player, claimed in his autobiography (Davis & Troupe, 1989) that he changed music three times: cool jazz 'Birth of the Cool'; the ensemble-led improvisational 'Kind of Blue'; and electric jazz-funk 'Bitches Brew'. But he was a leader in the movement and every note was played off against great bandmates.

Csikszentmihalyi developed the notion of creative people having a 'flow' of creative activity.

When people act creatively, they draw on diverse mental, emotional and physical resources and generate a 'flow' of work, this may be as writing, drawing, performing, making in whatever genre they work. This involves the ability to think in different ways to develop and connect ideas and to use different mental schemas and models. These include:

- Causal thinking – understanding the effects and consequences of a cause, or action, on other dependent actions. Such as the chain of cards, a chemical reaction, or nuclear fusion. This depends on rational, logical linear thinking.

- **Effectual** – conceptualising the desired end result and thinking through the means required to reach this end state. Often associated with entrepreneurial working (Sarasvathy, 2008)
- **Counterfactual** – challenging accepted wisdom by exploring the consequences of using the opposite to what appears to be the ‘obvious’ accepted approach. Developing a conversation or interplay between two opposing arguments which may eventually merge, or one wins out. This can be expressed in drama, stories, musically, games and other ways.

Divergent and convergent thinking

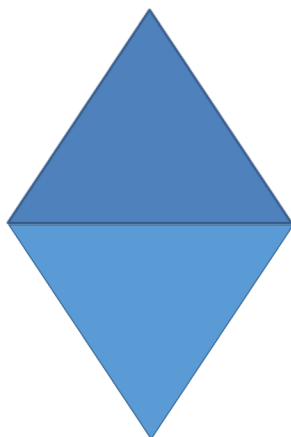
Csikszentmihalyi (1996) also suggested that innovators (people able to introduce novelty into a field) are able to use these apparently opposed ways of thinking.

Divergent thinking uses free association between ideas, experience and memory, sensations, feelings and any other material. It is not random, for the mind creates associations, connections and threads of meaning between apparently unrelated ideas. Divergence uses imagination to go beyond ‘what is known’ (fact) to generate new insights and possibilities. These may be realised as narratives, compositions or designs, for example.

Convergence is based on linear, causal and logical thinking: it reduces the alternatives available to isolate the correct answer to solving a defined problem. That is an essential mode of decision-making but it requires the diverse alternatives to be available in the first place.

Divergent and convergent thinking can be visualised as two triangles making the shape of a diamond. The divergent triangle generates possibilities, and at the point where these are maximised, the convergent triangle synthesises, merges or rejects these to produce a single, logical stream of thinking which can be actualised.

Divergent and convergent thinking



Divergent thinking:

- identifying the opportunity
- making creative connections
- exploring new information
- researching & analysing information

Convergent thinking:

- deciding possible solutions
- planning what to do
- developing & implementing the innovation
- communicating the idea
- monitoring progress & results.

(Rae, 2015i)

Task:

This can be done by one or more people.

1. Think of a problem you face where you do not yet have the solution. Define the problem by writing it down.
2. Each person goes away and thinks about it, then lists as many ideas as they can related to the problem. Not just 'solutions' but why the problem exists, how they feel about it, how it affects them and others. Imagining the 'ideal solution' – what might this look and feel like? How could it work?
3. Each person comes back and presents all their thoughts. Map these on post-its on a table or on a whiteboard.
4. This divergent material is then available for convergent analysis. So, if there are alternative, different solutions, first appreciate, then appraise these. Which solutions are most desirable, most effective, most practical, most economic, most ethically sound? How can you select between these?
5. If two options can be established, use the material to design how each of these could be realised. It is useful to have a choice of (at least) two to provide genuine alternatives. Design both of these, then present to other people involved to invite their comments and suggestions. That should inform a final decision.

We see these modes of thinking being used in modelling the creative process, next.

Csikszentmihalyi built on the work of others including Helmholtz, Wallas (1926), Koestler and explaining a creative process consisting of up to five steps, illustrated here by Marchant & Sesko (1997):

Table 1. The Evolution Of The Stages Of Creativity

Helmholtz	Saturation	Incubation	Illumination		
Wallas	Preparation	Incubation	Illumination	Verification	
Getzels	First Insight	Saturation	Incubation	"Aha!"	Verification
Traditional	Preparation	Incubation	Insight	Evaluation	Elaboration

(Marchant & Sesko, 1997: 3-4)

Preparation is becoming immersed, subconsciously or consciously, in a set of problems that are interesting and arouse personal curiosity.

Incubation is an indeterminate period during which ideas develop below the threshold of consciousness. During this time new neural connections are made and 'ideas' formed. Being a subconscious process, even 'mysterious', incubation has often been thought the most creative part of the entire process.

Insight is when there is a conscious realisation of an 'idea', an integrative connection or 'design' where pieces of the puzzle fall together.

Evaluation is the rational, detached activity of deciding whether the insight is workable, valuable and worth pursuing.

Elaboration is validating and working on the design and realisation of the insight.

It is important that these 'steps' are not only linear but recursive – that is, during a creative journey, the producer(s) is (or are) likely to *go back over them* and to revisit incubation and insights as a result of the evaluation and during the elaboration stages, such as to solve problems they have noticed. They are mental states as much as stages.

So where do ideas come from?

How do we know when and how people think and have ideas? This conceptualisation predated neuroscience which has enabled recent insights into the work of the creative brain. Beeman and Kounios (2009) were able to track the neural activities and connections being made prior to the conscious realisation of moments of insight, and subsequent research (e.g. Beaty 2020) continues to provide much more understanding of the neuroscience of creativity.

"Creative thinking involves the interplay of the brain's default and executive control networks, and that these connections allow us to spontaneously generate ideas and critically evaluate them, respectively. And we are learning about how our memory systems contribute: the same networks that we use to recall the past also allow us to imagine future experiences and think creatively." (Beaty 2020).

<https://dana.org/article/the-creative-brain/>

The genus of the ideas are already there. Within our subconscious minds, there are memory stores of experiences, images, sensations, feelings and information. Continuous associations and connections are being made between these, which then 'occur' consciously to us.

3.2 Forms of shared and social creativity: key ideas

Co-creation

Co-creation is simply collaboration by different people to produce a shared original work. It is a form of social creativity defined (e.g. Giaccardi, 2004) as a process leading to the emergence and sharing of creative activities and meanings in a given environment. Co-creation is a situated experience, combining synchronization and improvi-

sation (Prahalad and Ramaswamy, 2004), and enabling users to share their emotions, experiences and representations (Fischer et al 2005).

For example, co-creation can involve customers working with a business to contribute their ideas and preferences to the product or service design. Or a production team who work together on an event or project. It is a collaborative activity in which ideas and preferences can be generated by everyone involved.

Task:

1. Think of a time when you developed some original work by working (or playing) with other people. It may have been an event, a performance, a physical or digital creation.
2. What was it?
3. Reflect on how you developed the new work. What was the creative process?

There are many different kinds of social creative behaviours. Creative expression and performance have been important in many societies and cultures for thousands of years, in such forms as events, plays, poetry recitals, music, dance and even cave paintings. The social role of creativity in communities goes back a very long way. So, the collective performance of creative work, through festivals, music, drama, dance meets fundamental human needs for celebrating and engaging through collective cultural experiences (Dewey, 1934).

Storytelling - Sharing and listening

Storytelling, or sharing narratives, is a fundamental part of our way of sharing and making sense of our world. Everything and everyone is part of a story. We each have our life stories, which we use and recreate every time we talk about ourselves, our life events, aims and experiences. Stories are a means of making sense of the past and present. They can also be misused to retell history in a biased or misleading way – holocaust denial is an example. They are powerful and generative means of creating new narratives about future possibilities.

Individual Task: Use these words to start composing a short account:

‘At this moment I am.....’

Write, or speak and record if you prefer, what is in your mind. Just say or write what you think.

You are tapping into the flow of narrative in your mind. We can ask ‘simple’ questions to prompt our own and other people’s narratives: why, who, what, how, where, when, and

so on. Mostly these will elicit descriptive responses and recollections, rather than new insights.

If someone is describing a problem, such as having too many tasks to do, we can ask a question which prompts them to reframe their thinking:

‘What if you just work to complete what you think is most important?’

The ‘What-if’ question can be a powerful creative prompt to explore alternatives. As is ‘why not?’ and ‘how could?’. These prompts can stimulate new possibilities and logic flows.

Interpersonal Task: Talk with another person, ideally face-to-face, or online by video.

Find a problem or difficulty they are struggling with. Shortage of time, money or space are good starting points. Use the ‘What-if’, ‘why not?’ and ‘how could?’ questions help to open up new possibilities. Record or write down their responses. How can you help them work on these solutions? This is co-creation in action.

Other examples of social creativity include:

Music and dance performances: experiencing or joining in shared performances are powerful means of feeling emotionally and creatively connected with other people.

Drama and make-believe

Creativity in social/public spaces, such as public art, sculptures, landscaping and city-scaping

3.3 Digital and non-digital creativity

Does digital technology help or constrain creativity? What do you think, and why?

The answer may well be ‘yes’ to both options.

Most of us use smartphones, iPads, laptops and other digital technologies constantly, or even compulsively. This digital-brain interaction, especially using social media, makes the human mind behave as an information-processing system responding to the prompts and demands of the interface (Hopkins, 2019). Skills of conversation and collaboration beyond the digital interface do not develop and may atrophy. Yet digital applications can help both individual creative expression, co-operation and teamworking. So, it is not a simple digital-non digital argument.

But the ability to imagine, to form new ideas, stems from the human brain and the ability to interact with other people to develop them, is a human one which does not require digital tech. Technology provides a set of tools the creative mind can use, but develop-

ing personal creative thinking can be constricted by over-using mundane digital apps (typically, mobile phone) as a substitute for personal creativity.

We need to develop and maintain our personal creativity, as well as the ability to collaborate creatively when needed. So how can you get started?

Habits for personal creativity

New ideas are formed through associations of existing information being made in the subconscious brain's neural network. The creative mind thrives on:

- Plenty of sleep – avoid sleep deprivation
- Environments such as country, parkland or waterside walking, cycling or even running (try doing any of these without listening to music on earphones).
- Visiting creative and cultural spaces you enjoy, these may include public art galleries, historic spaces, festivals, cultural places, waterside places, and events.
- Reading a book or enjoying other creative arts such as music, drama, dance or film.
- Mind-clearing activities such as yoga and meditation, giving freedom from pressure
- Practicing for a creative hobby, such as learning a musical instrument, drawing, painting, writing, crochet or modelmaking. Practicing creative skills can condition the mind to form new ideas. If you are skilled or experienced in an art, craft or discipline, you can develop the background knowledge to be creative in it.
- Curiosity – noting and investigating questions, problems or situations which intrigue you
- Keep a notebook to write down or draw your ideas as you think of them. Many ideas are 'forgotten' by the next day.
- Creative production: spend time actually working on your creative projects. Whether these involve design, writing, composing, rehearsing and performing, the skills of connecting mind, hands and body to produce your creative work require practice to maintain and develop creative skills.
- The theory of 'ten thousand hours' deliberate practice to gain mastery in a field of your choice (Ericsson et al, 1993) simply demonstrated that training from childhood improves performance over a period of ten years or more. The number of hours and years can be disputed. The decision of how we invest our time is the important factor.

These kinds of activities help condition the mind for creative thinking.

Task:

1. What helps you to think creatively?
2. Which of these habits will you try out?
3. How will you tell if you have become more creative?

Creative moments

We become aware of creative ideas and insights as the subconscious mind makes connections between remembered past experiences, and our sensations and perceptions of the world around us. Consciously, we are aware of our perceptions, sensemaking and acting in the world, and ‘in the moment’ realise the new insight generated subconsciously (Rae, 2015ii). These creative insights can often be generated by social interactions with other people, such as conversations or shared experiences. ‘My best ideas are often prompted by other people’.

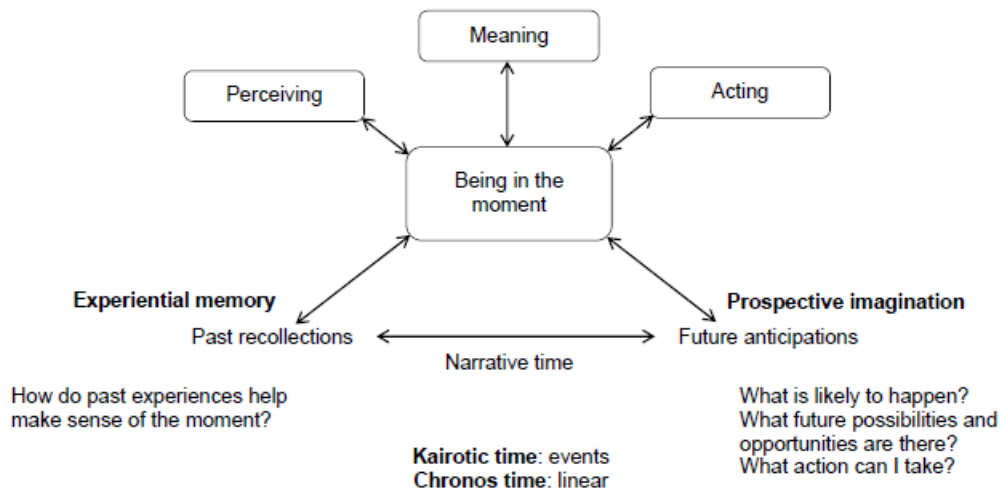


Figure 2. Time and the moment.

(Rae 2015ii)

Task:

Can you recall a moment which was:

- Special or memorable for some reason?
- Pivotal in changing the course of your life in some way?
- When you had an idea, insight or discovery you were able to use?
- When you met a person who became significant in your later life?
- What happened? What did you do as a result?
- How did you become aware of the significance of that moment?

At the time, you were ‘in the moment’ and it is only subsequently that the meaning or significance in your life story becomes evident. But in becoming more sensitive to crea-

tive possibilities, being aware of chance events, whether psychological, social, accidental or even funny, helps us generate new possibilities. Write them down or record them, you won't always remember these moments.

Example – accidental innovation on burnt carpets

Kelly was a young design student living away from home for the first time. Wanting to look her best, she needed to iron clothes, but her flat had no ironing board. She started to iron her clothes on the floor. But she realised too late that the heat from the iron not only flattened and smoothed her clothes, it also reached down into the carpeted floor, causing scorch marks. Embarrassed and a bit scared, she investigated the damage. This could be expensive! It seemed that the heat had changed the properties of the carpet permanently. This led her to investigate how this material could be used, and to research the effects of heat-treating carpet to provide a new material. Ultimately, she patented the process for heat-forming carpets and used this to generate a range of products which used surplus and waste carpet. The business had a limited lifespan, but the innovation opened up new career horizons for her as a business advisor, in ethical design and in materials recycling.

Social creativity and co-creation through Collective Intelligence

People working together have greater creative capacity to form new ideas more quickly than working individually. Also, the collective ability to transform ideas into action is greatly enhanced by the multiple skillsets and superior collective intelligence (Mulgan 2018).

There are increasing requirements as well as possibilities for human creative intelligence, which can be shared within and across different domains, and digital technologies can be used to assist this.

Mulgan defines Collective intelligence as 'any kind of large-scale intelligence that involves collectives choosing to be, think, and act together' (2018:14). It is informed social decision-making, with data tools and artificial intelligence able to inform human judgments. Creativity is one of the ten elements of collective intelligence; Mulgan proposed five organising principles for collective intelligence (2018: 67).

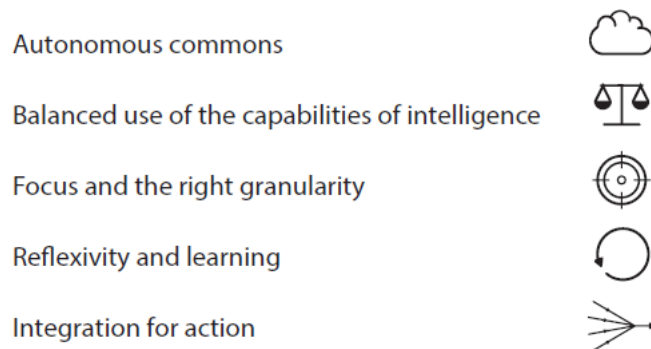


Figure 3. The Organizing Principles for Effective Collective Intelligence

Using these principles can help groups to learn from the past, to analyse the current situation, imagine future solutions and plan how to realise them. Collective Intelligence can start with, but goes beyond sharing Open datasets and other shared resources, for example, by connecting the human skills, insights and examples to show and exchange what can be done. Many examples are specific to the contexts and domain of the collective group – they may be professionals, makers, enthusiasts, volunteers, or simply people with a shared set of problems, a social situation or health condition.

Here is an example, Open Innovations in Leeds, UK. <https://open-innovations.org/> This shows the scope for continually applying open innovation by freely involving people and using data at city-scale or beyond, aiming to improve the quality of citizens lives, help people and create value. This can also provide the background information to work on co-creating local improvement projects.

The UK's National Endowment for Science, Technology and Arts (NESTA) website has materials and information, including a Design Playbook on Collective Intelligence: <https://www.nesta.org.uk/project/centre-collective-intelligence-design/>

Task:

1. For the problem or topic you are interested in, can you find out what sources of Collective Intelligence are available.
2. Which of these can you access?
3. How could you use them?

For example:

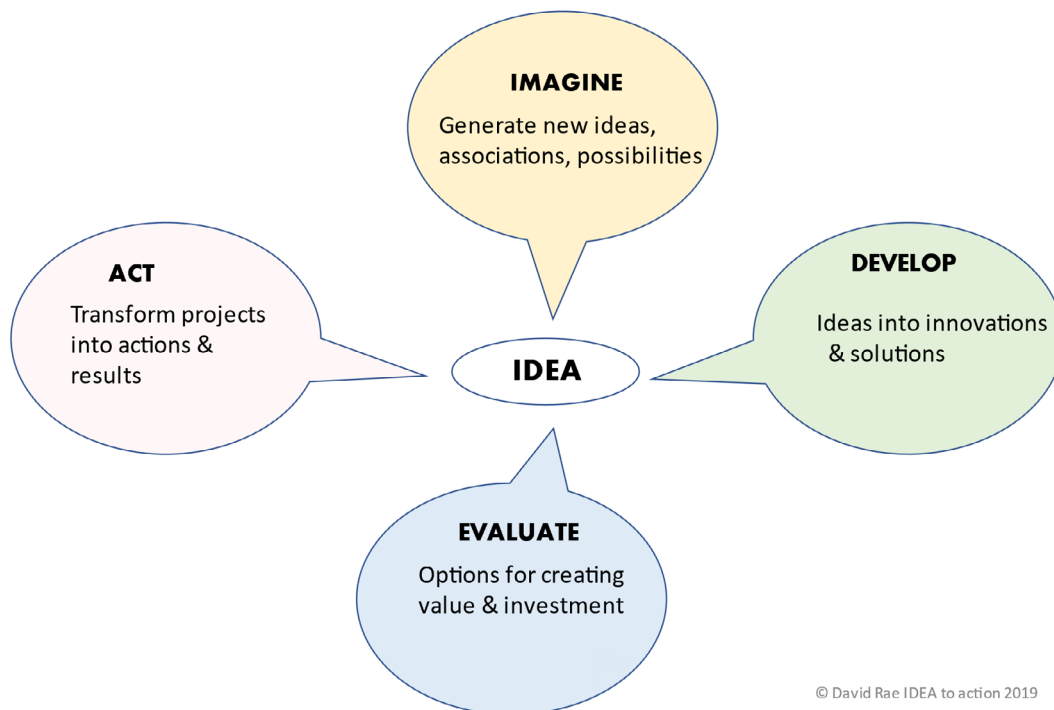
- Professional and membership organisations
- Research centres
- Websites which include user-generated content on specific topics (such as Wikis)
- Research and professional journals which provide Open access
- Open data portals e.g. <https://www.google.com/publicdata/directory>
- Other social innovations which connect people and shared intelligence

4 Structuring creativity – the IDEA loop

Creativity is a process, not a single act. Generating ideas is the feedstock for creative production, so that ideas can be connected, synthesised, some are always rejected because they do not fit, and a creative work is produced.

The IDEA loop (Rae, 2019) is a simple model which uses four connected activities to form, develop and work on creative possibilities. It is based on using a Mind-mapping approach (Buzan 1995).

To use the IDEA loop, simply think of a topic, such as a problem, an opportunity, or something which interests you to work on. Think about this and when you've chosen one, write it in the centre of a large notepad (or use a digital device if you prefer).



The IDEA loop includes the four activities of

- Imagining, or generating ideas
- Developing those ideas into interconnected possibilities
- Evaluating possibilities by analysing and choosing between them
- Acting by making and implementing plans to innovate

Each of these is explored in turn, with a creative task or questions for you to gain practice in using it.

4.1 Imagining – generative thinking

This is the initial stage of originating an idea to work on.

The brain will rarely produce ideas to order, but if you record those you have when they occur to you, then you can generate a list or stock of them. Noting images, things, situations or creations which intrigue you can help. If you are working with someone else (a co-creative team of two or three people) then each of you independently recording your stock of ideas means that when you meet, you will have a bigger resource base to use.

Task:

1. Start a logbook or notebook for your ideas which relate to your initial topic. It can be paper or digital as you prefer. Write or draw your ideas, things you notice, questions and observation on this every day, as they occur to you. Keep this up for at least five days. If you are working with other people, talk and share your ideas. There is an example of an IDEA worksheet at the end of this chapter.
2. Re-read your log every day, so you can go back to ideas and add to them, or connect together ideas and related material where you see connections.
3. Imagining is giving ourselves time to think, reflect, see the world in new ways and to recognise possibilities. When you have an idea formed in your mind, express it by explaining in your own words, writing, drawing or enacting it.

What kind of creative project could this become?

Its form or genre could vary widely, including:

- A visual artistic image such as a conceptual work, painting, bricolage or sculpture
- A performance such as music, drama, comedy, film or video
- A narrative or story
- An event such as a social, sporting or other happening
- A design for an artefact, such as a building, vehicle or product
- An item of clothing, textiles or with accessories
- A computer App, video game or interactive experience

Its genre or form will determine the modes of expression (how to express the idea) as well as the media which are used to create or design it.

Task:

What do you think the form or genre for your idea will be? Are there different options?

1. What medium can you use to create and express it? This may be 'analogue' such as simply writing or drawing by hand, or by using digital tech tools to create it. Or possibly a combination of both.
2. You are making creative choices about the means of expression here.
3. Go and produce your creative concept – at its simplest, this is just one visual image, a sketch, a story scenario, which expresses the creative idea.

This is rarely 'right first time'. Creativity is often 'iterative' – it helps to try different approaches, compositions, techniques, to find one that works for you. The aim is to produce a means of expression which you can explain or show to someone else, and which communicates the idea.

Stuck for ideas? The NESTA Fast Idea Generator is a useful tool for developing ideas, based on nine thinking tools. https://media.nesta.org.uk/documents/Resources_2017_version_11.pdf

4.2 Developing ideas – engaged working

Developing ideas is taking the concept and showing how it can be realised into a creative work of the intended form or genre. This develops it into some kind of finished work, such as an innovation (a new idea which provides a solution or means of creating value) or a creative medium. This is 'elaborating' or showing how the idea can be realised. For example, a video or film concept, even a short advert or 'Tic-toc' can have a storyboard to show how a series of images creates a narrative or logic and 'flow' for the viewer to follow. We are thinking about the viewer, user or reader here. What is their experience intended to be? What is the journey you want to take them through?

A design – for any artefact or product, from the simplest to the most complex, physical or digital – can include a conceptual or artists image, which is then elaborated with an understanding of the target audience or user – who are they, what are their reasons for interest in the product, why would it engage their interest? What makes the product unique, different or special? What would their experience be? So, our imagination here is used to anticipate or influence the user's senses and imagination:

- How will it start?
- What images will they see?
- What sounds and voices are they going to hear?
- What is the emotional tone they will feel? (anticipation, joy, excitement, desire, fear?)
- What mental and emotional connections do they make? (cues from images, sounds, imagined experiences, such as tasting the deep chocolate ice-cream)
- How will it end? What is the intended action they will take (buy the ice-cream?)

Task:

Use these questions to plan and create the storyboard, set of sketches or 'treatment' to show the idea or creative concept, and how it will be developed to engage with the intended viewer or consumer, and how it can be produced. It can include a finished product, or a sketch, plan or 'rough cut' version. The aim is to produce a short presentation which can be shared with the target audience as well as collaborators and backers, such as investors.

Reaching this stage may involve co-creating the project with someone else. You may have a co-writer, composer, designer or producer whom you work with; or this 'treatment' is your own work which you share to engage others with your production, and to bring their creative and organisational skills, and resources, to help realise it.

Present your storyboard to someone else, or make a short video on your mobile phone (or another device) to explain it. Play it back to yourself, and if you like it, you can share it on Youtube.

4.3 Evaluating possibilities – analysing and choosing

Evaluation is the stage in the creative process where we pause and check on the quality, the 'fit' with the audience, the feasibility and the overall value of the ideas. It is easy to believe passionately in the creative project and to rely on this impetus alone to complete and take it to market. But if we do not appreciate the audience and other stakeholders along the way, that debut in the market may not be successful. So, evaluating the ideas is a necessary 'reality check' before too much time, effort and money is invested in the project.

Almost by definition, more people than the originator need to be involved at this stage, since you cannot give a 'second opinion' on your own work. This is where the creative concept and storyboard or 'treatment' are shared with other people to gain their feedback. This may include both appreciative and critical comments and suggestions. These are essential in moving between the 'divergent' creative stages and the 'convergent' realisation stages of the process.

Task:

1. Arrange an informal presentation or viewing of your early-stage work. This may be face-to-face (ideal) or via an online event – or both.
2. Invite a small group of your co-workers, people from your intended audience, and others whose feedback may be useful. These could include teachers, writers about your areas of work and other artists or producers.

3. Develop a set of questions for them to respond to, and to offer suggestions. Starter questions to ask could include:

- What did you see as the purpose of this work?
- Did you enjoy the work? Please explain why:
- Who do you think it will appeal to?
- How could it be realised better?
- Please make any other suggestions towards its improvement?

This event should generate feedback, suggestions and new insights which the producer or team will not have thought about, and which can be considered as means of improving it. Not every comment or suggestions is helpful or actionable at this point. People may have misunderstood the intention of the work, but that itself is a useful insight. Consider the evaluation feedback and how the project can benefit from these insights.

Evaluation can take a project back into a 'development' phase for new work or changes to be made. Even completely new insights may be included. Then a second evaluation – maybe a more focused review – can take place before moving to the final stage of action.

4.4 Acting – making and implementing plans for innovation

Taking action, or elaboration, is the stage of the creative process which brings the project or the product into contact with its intended audience. It is the 'launch' or debut of the work and requires detailed planning, resources, and project management. These organisational skills are vital, and it may well require competences beyond the originator(s) – so creative teamwork is essential.

Now is the time to develop your plan to organise how and when you will launch your creative project or product.

Task:

Create your plan to launch the creative product:

- What is the project, product or experience you are providing?
- When and where will it be launched?
- Who is the audience it is aimed at?
- What is your target audience size, and how will you ensure everyone can access it?
- How will you promote and market it to your audience?
- How will you use social media, mainstream and specialist media to publicise it?
- What tasks need to be completed and who will perform each of them?

- How will you ensure everything is on track for the launch?
- How will you evaluate the success of the launch?
- What is your plan to follow on from the launch?
- Prioritise - what will you do first?

5 Rethinking creative places

This section is to help you think about developing creative places, with an activity.

Can you think of any spaces you'd describe as 'creative'? Spaces or places in which you feel creative activities and expression will be 'natural', encouraged, safe and productive?

Maybe you thought of...

- A studio
- Rehearsal room (music or drama)
- Workshop
- Relaxed space with soft moveable furnishings
- Makers' space or Hackspace (shared space, tools and technologies available to use)
- Outdoor performance or playing space
- Anywhere else...?

What makes these spaces supportive for creativity?

We know that the environment we are in can encourage or discourage creative activity. Old-style schoolrooms with high ceilings, rows of desks, imposed order and control, noise and odours, were not often creative places. Factories and offices were usually not intended to be creative places – they existed to produce standardised, uniform products and processes.

What can make a space like this into a more creative environment?

This activity asks you to use the IDEA loop to design a creative space.

Task:

As an individual, or better still as a small group, think and then list all the attributes (qualities) you can for a creative workspace.

Think about qualities such as space, colour, light, seating, work surfaces, textures of materials, display methods, sound and noise, temperature and ventilation, technology.

- How can these be used to influence a creative ambience, or 'mood'?

Now focus on an actual space you use or would like to use for creative activity. This may be your own working area (no matter how small), or a classroom, meeting room, public space, studio, or workshop. It could be an outdoor area such as a yard or garden. It could be a neglected or 'unwanted' space which you think could be better used. There are many to choose from. Just walk around your school, campus or neighbourhood and look for some, then choose one.

- What creative activities could the space be used for?
- It is important to establish the likely uses and the kinds of activities people may want to conduct. It may be a multi-use space. What kinds of activities – will they be mainly group or individual? Writing, planning, drawing, making, meeting, performing?
- How long will people spend there?
- What facilities will they need?
- How will you design it? This is not yet doing the actual design, but planning how you will organise this. How will you involve the people who will use it?
- Can you use activities such as: acting-out what the space will be used for, drawing, or making a model of the space and moving items around in it, to involve users?
- Simple 3D modelling and simulations may be used, such as by using SketchUp <https://www.sketchup.com/>

Thoring et al (2018) developed a typology and set of 49 Design Principles for creative spaces and this work is commended for further exploration of this field.

Finally, create your own design sketch or picture of the how the space could look. This could be a drawing, a simulation, a mind-map, or a collage or 'rich picture' of images you have harvested from users and other sources to create your own visual image.

When you have finished your design, share it with your team or co-creators and invite each other's comments.

How did it go?

6 Taking action for creative learning

This final section is for reflecting on the creative process and how it has gone. Thinking back and reflecting is a vital part of the learning process, indeed, without reflecting we may be unaware of much of the learning we may have gained.

Task:

1. Browse through your notes, responses, ideas and creative work from this chapter. Yes, you can see why you needed to make some notes and sketches!
2. These ten questions are intended to help your reflective learning. Think about each one in turn, and make some short notes about it. If it helps, go for a walk, do something else, and come back to them.
 - What have you done or produced?
 - What do you like, and why do you like it?
 - What creative skills have you developed? What skills do you want to develop further?
 - How do you get into the 'flow' to produce your creative work?
 - What work do you think may be most useful, worth developing, or interesting?
 - What do you dislike, or feel did not go well? Why was this?
 - What is unhelpful, that you need to avoid, limit or manage?
 - How do you feel you can co-create most effectively with other people?
 - What do you need to do (or not do)?
3. How can you maintain, and continue to develop your creativity? What IDEA are you going to work on next?

IDEA WORKSHEET

IMAGINE: Ideas	DEVELOP: Innovations & Solutions
ACT: Projects into results	EVALUATE: Options

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Chapter 4.3

Creativity and entrepreneurship in higher education through the framework of the Sustainable Development Goals

Abstract:

The UN Sustainable Development Goals ('SDGs') as defined in the Agenda 2030 aims to encourage a more sustainable perspective on society. Becoming aware of the main sustainability issues and developing the essential competencies for acting as responsible citizens are crucial to find effective and sustainable solutions for the pressing environmental, social and economic problems that may affect our future. The challenges addressed by the SDGs require an innovative framework where creative solutions are designed according to the need of a sustainable future. Merging creativity, innovation and entrepreneurship is vital for introducing and addressing the sustainability issues in the fields of environmental, economic, and social development. With an interdisciplinary perspective, education can find common ways for developing creativity, innovative ideas, problem solving and entrepreneurship skills and competencies within a sustainability framework. The aim of the current chapter is to introduce a SDG framework to help teachers and students connecting education for sustainable development, education for creativity, innovation and entrepreneurship to responding to the SDGs and related challenges.

Keywords:

Education for Sustainable Development, creativity, entrepreneurship, SDGs, entrepreneurship education

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Chapter Structure:

1. Introduction
2. The Agenda 2030 and the sustainable development goals
3. Creativity in innovation and problem-solving processes for a sustainable future
4. Business and sustainability: Rethinking the approach to entrepreneurship in education
5. Promoting a sustainable vision for creativity and entrepreneurship in higher education
6. Conclusions
7. References

1 Introduction

In the current socio-economical system, the themes related to sustainability are gaining more importance. The need to rethink our future, finding a harmonic coexistence between human beings and other living beings on the planet has led to the requirement to take into account sustainability issues in all the different dimensions of human life and activity (Biasutti, 2015). The main themes of sustainable development are focused on promoting human development in a way that is respectful of all the people and of the planet and other forms of life that live on it (Makrakis & Kostoulas-Makrakis, 2013). Introducing the topics of sustainability may, at first, appear easier in disciplines related to ecology, biology and social justice than other fields of knowledge such as business and economics where integrating different perspectives without losing the final goals is a more complex task. If the main objective of business remained to (solely) maximize profit and assure the economic growth of the organisation, how can sustainability (and its impact on the organisation's finance) be introduced in the discussion?

Innovation in business contexts often draws on entrepreneurship and creativity: these disciplines have been promoted in higher education institutions as the core to empowering organisations in private, public and third sectors, promoting the sustainable economic growth of firms and ventures, sustainable finance and conforming it to the ethical, responsible and sustainable principles. We can wonder: is it possible to re-address creativity, entrepreneurship, innovation and education to integrate them in a perspective for a sustainable future?

Starting from these questions, the current chapter examines the links between entrepreneurship, creativity and Education for Sustainable Development (ESD), with particular reference to higher education learning environments to allow teachers, students and academic staff to connect them in a SDG framework and to respond to the related challenges. The Agenda 2030 and the Sustainable Development Goals (SDGs) will be firstly introduced. Then, the concepts of creativity and entrepreneurship will be examined considering specifically their linkages with the principles of sustainability and ESD. Finally, some indications for reflecting in a sustainable way about entrepreneurship and creativity in higher education are given.

2 The Agenda 2030 and the sustainable development goals

The SDGs – presented in the document entitled *Transforming our World: The 2030 Agenda for Sustainable Development* (United Nations, 2015) – are a series of 17 interrelated goals, defined by the United Nations as a strategy to achieve a better and more sustain-

able future. The SDGs offer an opportunity for finding solutions and technologies to address the world's biggest social, environmental and economic challenges. The SDGs define sustainable development priorities and objectives around shared aims. The SDGs call for worldwide actions and activities involving countries, governments, companies and civil society to eradicate issues such as poverty and to produce a life of respect and opportunity for all the people. The SDGs convey partners to address the world's most crucial challenges. All governments have agreed to SDGs, and the achievement of SDGs depends on collaboration and cooperation between all the administrations.

The 2030 Agenda for Sustainable Development recognizes the close link between human well-being, the health of natural systems and the presence of familiar challenges for all countries. The SDGs aim to address a wide range of issues related to economic, social and environmental issues. They cover an extensive range of sustainable development topics including poverty, health, climate change and environmental issues, which are relevant for many companies.

In the Agenda 2030 on 25 September 2015, the UN General Assembly stated:

"We resolve, between now and 2030, to end poverty and hunger everywhere; to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the lasting protection of the planet and its natural resources. We resolve also to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all, taking into account different levels of national development and capacities." (United Nation, 2015, p.3)

The 17 SDGs are the following as reported in Figure 1:



Figure 1. Sustainable development goals (United Nations, 2015).

More information about topic, themes, report and so on about SDGs and 2030 Agenda for Sustainability Development, can be found into the following website <https://sdgs.un.org/2030agenda>.

The 2030 Agenda for Sustainability Development and its 17 SDGs are pillars of sustainability and are important from many perspectives. The SDGs and related targets – which have to be achieved by 2030 – have a universal character and are based on the integration of the three dimensions (environment, society and economy). The unsustainability of previous development models, at an environmental, economic and social level, and the need to bring new creative approaches and new development models are emphasized (Cordova & Celone, 2019). Achieving the objectives of the agenda requires a strong involvement of all members of society, and in particular of people working in business and education.

The relationship between innovation and SDGs, in the economic context, needs particular attention, because some SDGs are essential for achieving the objectives (Filser et al. 2019).

Education can be considered a crucial discipline for disseminating and infusing sustainable development principles (Biasutti & Frate 2017), and entrepreneurial training and entrepreneurship education, more widely, can be helpful for pursuing corporate sustainability (Cordova & Celone, 2019). ESD suggests innovative pedagogical solutions

based on interdisciplinary and student-centred approaches, which have an impact on students' self-regulated learning (Biasutti et al. 2018) or collaborative learning and problem-based learning (UNESCO, 2017; Advance, H. E., 2021). ESD can provide a framework to innovative didactic practices in higher education institutions, encouraging creativity, critical thinking and future-oriented skills. ESD fosters critical reflection of teaching activities that is a core action for developing meta-cognitive strategies (Biasutti et al., 2016).

Thinking about innovative pedagogical practices and methodologies encourages many teachers, academic staff and students to use their skills, knowledge in a whole new way, thus opening up new challenges that can be overcome through the use of creativity. In the following sections, a review of issues regarding creativity in innovation, entrepreneurship and problem-solving processes for a sustainable future is presented.

3 Creativity in innovation and problem-solving processes for a sustainable future

The concept of creativity is one of the most complex in education science research: creativity can be defined in several ways, and many different theoretical definitions of this construct have been developed. Creative thinking is also called “divergent thinking”, for highlighting its non-conventional nature. All definitions have the following features in common (Tang, 2017):

- The idea of generating something new, not already existing;
- The role of cognitive, psychological and emotional components in this generative process, as well as the importance of previous experiences in defining a framework for the work of creative processes;
- The possibility to “reverse the perspective” while applying creative processes to a specific situation or event.

The concept of creativity is not limited to (completely) new ideas or points of view. Creative processes do not merely rely on original ideas – which may include both genial and resolute ideas – but also extravagant and useless solutions. It is important that originality is supported by the more practical concept of effectiveness (Runco & Jaeger, 2012), which indicates the possibility to successfully develop or apply the innovative ideas in the real world. Runco and Jaeger's (2012) definition of creativity underlines the importance of negotiating the opportunity to find new solutions for “old” problems with the need to implement these solutions easily and effectively for enhancing current situations.

In line with the main goals of sustainable development, creative skills and processes are important for the adoption of innovative and sustainable practices in the fields of business, economy and technology (Awan, Sroufe & Kraslawski, 2019). As reported in the Agenda 2030 (United Nations, 2015), creativity, entrepreneurship and innovation are considered core elements for promoting a sustainable economic growth and a decent professional activity for all the citizens (SDG 8). A continuous search for creative solutions and encouraging creative thinking are necessary in productive organizations to empower problem-solving collective abilities and rethink productivity in a greener perspective (Awan, Sroufe & Kraslawski, 2019). Creative thinking may lead to new solutions not only for improving the production processes but also for enhancing practices for research and development, and finding more effective strategies for training and developing employees encouraging lifelong learning (Laužikas, & Mokšėckien, 2013). In addition, creativity can be considered one of the core competences for active and responsible citizenship. Being creative will help people in facing effectively and in a flexible way the challenges of the future (Hensley, 2020). Often, traditional solutions have only partially solved problems of complex situations. To introduce creativity in the process of problem-solving may encourage to define the most suitable solutions according to sustainable development principles.

Regarding the promotion of creativity in education, it can be difficult to connect divergent thinking to the approaches of ESD. Including and perhaps even prioritising sustainability in one's thinking means to be aware of a complex range of issues, which can limit the creative processes. To consider several constraints can pose limitations to creativity which – in a common sense – is regarded as a free and independent cognitive act. On the other hand, the concept of creativity may become core to the generative process of divergent thinking with creativity becoming one of the core skills for generating new knowledge, finding new solutions and reviewing old ways of thinking and acting. Stables (2009) found that if students in secondary and tertiary education are made aware of the main issues of sustainability and encouraged to develop a sustainable view of their future, they integrate creativity successfully into their learning activities, their approach to designing tasks and solutions.

In higher education, teachers and educators may enhance the use of creative thinking by adopting the paradigm of transformative learning (Sterling, 2001). Placing into action divergent thinking and innovation in the learning process are encouraged for contributing to the generation of new knowledge and to the transformation of existing knowledge (Sandri, 2013). The introduction of a method based on creativity can help to rethink the approach to entrepreneurship in education.

4 Business and sustainability: Rethinking the approach to entrepreneurship in education

The main definition of entrepreneurship links the individual and the social dimensions of human activity (Stevenson, 2000). The concept of entrepreneurship refers to the development of a specific opportunity starting from resources that are already present in the context of life of the entrepreneur. The opportunity often relies in the perspective of innovating, or re-novating, a situation or a product, to improve its usability, effectiveness or enlarge possible target users (Eisenmann, 2013), and, consequently, increasing the profit of the entrepreneurs. This definition is based on a theoretical balance between the improvement of users/customers' life and the increasing of entrepreneurs' economic profit. However, there are too many examples in which the need to increase the profit has pushed the well-being of customers into the background, as well as the respect of the environment and the natural resources.

There has been a growing interest of companies in the SDGs linking business activities to sustainability (UN Global Compact, 20xx). Companies can use the SDGs as an all-embracing outline to design their market strategies. Several aspects can be considered such as recognising forthcoming business opportunities, consolidating stakeholder relations, defining a common language and developing activities focused on joint aims.

The SDGs echo stakeholder expectations in line with policy decisions at the international, national and regional levels. Aligning priorities with the SDGs, companies can reinforce commitment of clients, workers and other stakeholders. Investing in the accomplishment of the SDGs maintains aspects such as the presence of rules-based markets and clear financial systems. The inclusion of SDGs can define a common framework and a shared language that support corporations to communicate consistently with stakeholders about their performances and contributions.

The role of entrepreneurship is moving from one centred on markets, products and profit to one centred on the sustainability of products from an economic, social and environmental point of view (Diepolder et al., 2021). How entrepreneurship can promote to the SDGs and how their application can transform enterprises is an issue for several companies. Many entrepreneurs consider that their small medium enterprises should act as a "good corporate citizen" and that it is their responsibility to protect the environment for future generations; and to care about the well-being of society (George et al., 2016). However, entrepreneurship can be the instrument for reaching a sustainable world and overwhelming the nature of these global challenges (Apostolopoulos, et al. 2018; Rachid, 2019).

Many organisations are attempting to implement strategies in line with the SDGs through increasing participative frameworks towards environmental change (Apostolopoulos, et al. 2018); creativity and innovation has been proven being an engine for most of the SDGs (Cordova & Celone, 2019). The SDGs call on all business sectors to use their creativity to solve sustainable development challenges adopting innovation and imaginative solutions. SDGs offer to leading companies the opportunity to demonstrate how their activities are in line for serving the advancement of sustainable development (Filser et al., 2019).

In this scenario, ESD with its specific methods, tools and objectives, acquires importance for creating the necessary human capital to enhance product and process innovation and through the entrepreneurship, education and training create entrepreneurship-related human capital, skills and behaviours. Rachid (2019) underlines the role of education in entrepreneurship education for creating a socially and ecologically aware approach for learners and teachers.

Another purpose of ESD is to provide entrepreneurs with the skills, competences, and attitudes to evaluate the best business opportunities taking into account the environment and the society needs. These competences are constituted of several key components such as knowledge and skills required in specific contexts that allow people to act responsibly and be self-organized to achieve goals (Diepolder et al 2021). In the context of sustainable development, future professionals should adopt a user-centred approach (Aerni, 2015) in which the main focus of the entrepreneurship process is the person as final user and the improvement of her/his life through the product/service, rather than the final profit.

Issues emerging in the contexts of SDGs require people to develop a wide range of interpersonal abilities (Hermann & Bossle, 2020) for promoting collective actions and collaborative interventions to solve them. A sense of responsibility, emotional skills, involvement both in a personal and interpersonal perspective are needed to successfully face problems in a sustainable development perspective. Moreover, problem-solving abilities and reflective skills, such as system-thinking, strategic mindset, interdisciplinary perspective, and practical abilities, are essential for effectively addressing sustainability topics and issues (Lambrechts et al., 2013; Lans et al., 2014).

Hermann and Bossle (2020) claimed that there is a need to infuse sustainability in education based on a holistic approach grounded on the interdisciplinarity of curricula.

In addition, educators have to be trained with pedagogical principles that help students to understand progressively complex sustainability problems while shaping their entre-

preneurial attitudes. The future entrepreneurs are considered active and key actors for reaching SDGs and creating new values and business dealing with the urgent issues underlined in SDGs (Hermann and Bossle, 2020).

In conclusion, entrepreneurship has a central role in promoting and reaching the SDGs, creating new values. As innovation and creativity can, entrepreneurship drives and responds to new changes about sustainable development in social, environmental, and economical issues. Promoting a sustainable vision merging creativity and entrepreneurship can be a way for reaching SDGs in higher education and it is discussed in the following section.

5 Promoting a sustainable vision for creativity and entrepreneurship in higher education

Rather than questioning the importance of introducing sustainability-related questions into various disciplines, the question is at what level to introduce the connections between sustainability, entrepreneurship and creativity in higher education institutions. Several European higher education institutions developed a great variety of curricular programs and extracurricular activities focused on business education. In Europe, entrepreneurship and enterprise education has been introduced to and established within the curriculum in the last couple of decades. Nowadays, in Europe, entrepreneurship education at European universities aims to go beyond starting new ventures. The creation of business plans focuses on concepts such as growth, progress, innovation, and creativity. Entrepreneurship education is considered the machine to drive creativity and skills among all nations and societies for job creation and economic growth. Entrepreneurship concerns development, creativity, and innovation (Durufle et al. 2018) and students are required to reflect critically on some real issues related to the economic and technological growth. To find effective solutions they do not only have to use their creative processes but also to contextualize their reflections to the real world. Several online databases offer the opportunity to access data related to the main economic and entrepreneurship themes. Some examples can be found at the following links:

<https://unstats-undesa.opendata.arcgis.com/> <https://unstats.un.org/sdgs/dataportal>.

Applying these concepts exclusively in business education classes seems very limited and sectorial. Instead, cross-disciplinary models are developed that try to apply sustainability, entrepreneurship and creativity in several contexts and university courses overcoming the disciplinary boundaries and infusing SDGs in the syllabi (Biasutti et al. 2018).

One of the most important changes is connected to the shift from and an individualistic

perspective – mainly relying on profit – to a more social view, where people actively collaborate for common goals, as human development and the enhancement of living conditions for all living beings (Lans et al., 2014). The values and the principles of sustainable development have been introduced also in the disciplines of business and economics, leading to new perspective in entrepreneurship education and education experiences. New fields of knowledge, such as the social entrepreneurship (Kickul et al. 2018) focus their attention on the role that business may have in promoting social change and enhancing human life.

To integrate education in creativity, innovation and entrepreneurship with a perspective of sustainability, Shu, Ho and Huang (2020) have proposed a model based on four dimensions for introducing students to the main themes of innovation and entrepreneurship as presented in Figure 2.

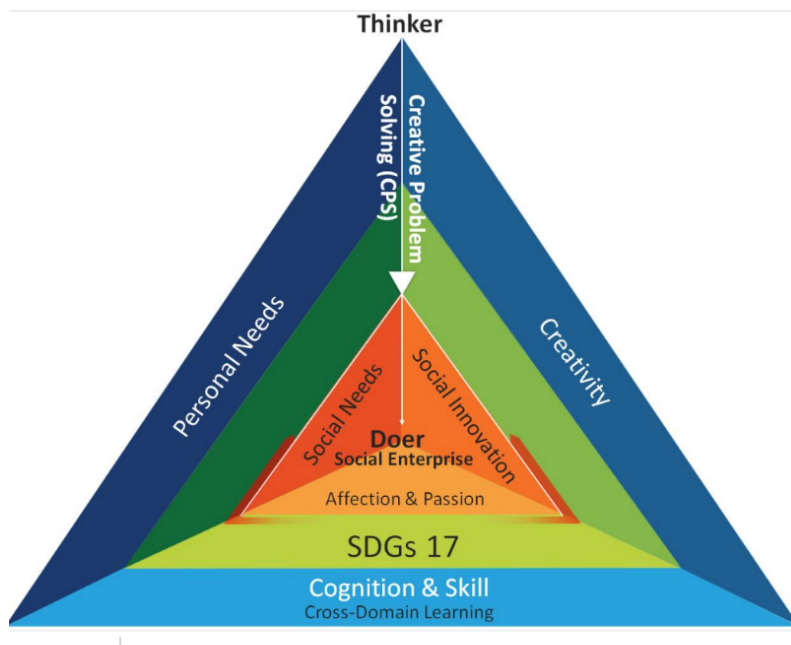


Figure 2. The sustainability-oriented CIE education framework from Shu, Ho & Huang (2020).

The first layer refers to the thinker and its basic structure, the second regards the catalyst of SDGs. The third concerns the advanced structure of cultivating SDG thinkers and the fourth is the generation of students who will attempt to start up social enterprises. Based on the model, the first dimension presents the main features of the thinker as basic elements of entrepreneurship education; the second is presents the SDG 17 (*Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development*). This goal is one of the most comprehensive of the Agenda 2030, since it aims to highlight the role of practices and networks as changing agents for a

sustainable future. The contents and aims of this goal should be first introduced to students – in a way consistent with their age and grade – and then they must be integrated in real contexts, examining the links between them and real-life issues. This dimension includes sublimation, where students may personally re-elaborate the contents and values of the 17 SDG for planning solutions to problems they care for. The third dimension concerns the advanced features of the entrepreneurship education, examined in the light of the sustainability perspective. The fourth and final dimension is called doer/social enterprise: in this phase, students think about themselves as a part of the society striving cooperatively for enhancing human development. This implies the shift from an individual paradigm to a social and collective one.

6 Conclusions

The need to rethink our vision of the economic world, considering the urgent sustainability issues has led to the analysis on how to develop entrepreneurship and creativity competencies in higher education, framed in a ESD perspective. The challenge is two-fold: from one hand, to shift from an individual to a social and collective paradigm and, on the other, to move from a product and profit-oriented paradigm to a social one. A more sustainable perspective implies the balance between the search for profit and the improvement of the life of the costumers, users and other beneficiaries, paying particular attention not only to their “personal” needs as costumers (too often unnecessary and inducted by market laws) but also to the primary needs of people, society, and the environment now and in the future. In this scenario, education is the key vehicle for inducing these changes and can provide a framework placing sustainable human development as its main value. The main challenges are to monitor the implementation of SDGs and to develop reliable and effective instruments for measuring the changes and assessing the results obtained. Considering the interconnection of challenges that are part of the definition of the sustainable development goals, it is crucial that higher education institutions promote students’ development of the transversal abilities for facing different situations, both the unexpected ones, but also the common ones in an innovative perspective. Creative thinking should be encouraged in a framework of user-centred entrepreneurship, focusing on the improvement of human life, not only short-term, but also in a longer-term perspective of the society and the environment. In this framework, the reflective thinking processes may result in effective, affordable, realistic, and sustainable solutions to current society problems. Higher education should encourage students to think “out of the box”, but always keeping in mind the themes addressed in the Agenda 2030 SDGs. The attention to SDGs can be a guide to achieve these changes and ESD the instrument to accomplish the goals in the environmental social and eco-

conomic dimensions. Additionally, it can create a new generation of creative, innovative entrepreneurial and active citizens living in a better and sustainable world.

Reflective questions:

- How can we evaluate if a creative idea may be an effective solution for a specific problem? Which indicators should be considered for assessing its effectiveness?
- Are there situations in which pursuing an increasing profit should not take into account the respect of human rights? Why?
- According to you, which are the SDGs that are most challenging for entrepreneurs? Why?
- Give examples for creative problem-solving of SDGs.
- How do the Shu et al. model bridge the gap between current CIE education and SDGs?

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Chapter 4.4

Co-creative design in education: some practical examples

Abstract:

The chapter reports on the author's empirical reflections on his own creative design journey and how digital tools facilitate the transition to co-creative design implementing a cooperative know-how.

Drawing on his own work's challenges to creativity and finding solutions typical of entrepreneurial life, the author defines solutions as the outcome of a creative process that draws inspiration from real and digital contexts.

The analysis reports experiences from writing on paper, from the first word processors to today's collaboration tools that reinforce collaborative capacity by opening new scenarios for creativity, but especially for creative capacity stimulated by interaction and collaboration.

Some digital tools, especially the heirs of word processors, are presented in some of their characteristics in order to better understand how certain functionalities support the creative process.

The author presents an operational vision of the creative process, reminding us of the need to carry out defined processes and activities in which the creative flow is unleashed as it is appropriately stimulated and channelled towards tangible results.

Keywords:

Word processor, digital board, entrepreneurial mindset, education, cooperative know-how, co-creative design

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Chapter Structure:

1. Introduction
2. Entrepreneurial mindset and innovation cannot be split
3. A new learning paradigm: cooperative know-how
4. How to boost the co-creation process in educational design?
5. Using tools to study and work
6. The creative moment

1 Introduction

I consistently look to creativity as a key necessity for innovation in my work in the education sector, in the particular field of Technical Vocational Educational and Training (TVET).

I think of innovation as a synonym for creativity: if you want to be innovative, you must be creative. First, you have to find the information that helps you to be creative and then transform this information into something new. This requires that you continue to move forward rather than remain at the initial level of your understanding.

Your focus always needs to be on finding new solutions in response to changing market needs, your competitors, or simply to meet the daily challenges you face as an entrepreneur. In fact, in today's world, the entrepreneurial approach to successfully overcoming life's challenges is a unique advantage in progressing in any field.

2 Entrepreneurial mindset and innovation cannot be split

Creativity is a specific characteristic of the entrepreneurial role, and entrepreneurial skills are considered essential nowadays for anyone active in the labour market, not just entrepreneurs.

To do something better, you need to expand your skills. Thus, identifying which skills you need to expand is a first step, including those that can boost your creativity.

An important part of unleashing creativity is giving your energy to a cause. To be creative in working for a cause means being at the forefront and in a good frame of mind to improve something that already exists or to find a solution that does not yet exist.

You also need to build your energy because maintaining a creative mindset and engaging in creative activity take a lot of energy. This chapter addresses creativity in my field, the education sector.

This next slide shows a logo I designed in the 1990s.



Figure 1. cscs.it logo: to know, to do, to be

Everyone nowadays understands what the term ‘skills’ means, but in the 1990s, when I designed this logo, the awareness of skills was not the same as today. My parents, my friends, and most of my acquaintances did not understand what I meant when I tried to explain that I was working to improve the skills of workers. That is why I created a graphical representation to explain, in a facilitated manner, the learning process and the difference between knowledge, skills, and competencies.

The question I needed to answer was: What exactly do you do? The challenge was to give a short answer, maybe with an idea, but in the beginning, my answer was overly descriptive. I spent a lot of time explaining that I work in the field of vocational training, designing and running courses to develop adult learners’ competencies, skills, knowledge, etc., However, most of my interlocutors did not really understand this because, at that time, the schools in Italy did not have a competency-based approach. They only taught theoretical knowledge, and continuous learning and adult education were not very common.

In those frustrating interactions where I was trying to explain my occupation, I came up with the image shown in the above logo, linked to Leonardo da Vinci’s *Vitruvian Man*, which places the human body in relation to its ambient, to illustrate that my work is essentially to support people in their growth.

In sum, this image shows that starting from a static position, an individual progresses by increasing their knowledge (to know), interacts with their environment and through

their work (to do), and finally uses their skills to move into an expanded dimension, an equilibrium that allows for deploying their competencies in a very complex mechanism of combinations (to be).

Nowadays, TVET is largely recognised as an essential element for economic growth that involves a large part of the population. In the current context of complex interrelationships, it is easy to understand that without skills and competencies, people can encounter difficulties in their social life, in defending their rights, in accessing services, and mostly in accessing the labour market.

I needed to explain all these concepts concisely through a logo on a business card, and the solution for me was this image.

My mission was to facilitate the learning process to allow people to gain the right skills for their life and work, and I was satisfied with my creation. However, in today's world, this image is no longer appropriate to illustrate my mission. The following section explains why this is so.

3 A new learning paradigm: cooperative know-how

Today, I still have the task of communicating a complex message that is similar to the previous one in order to explain my mission, but the same image is no longer effective in explaining the current needs of learning.

For an effective learning process to take place in today's society, individuals cannot work in isolation. The individual stance cannot be seen as a 'natural' state for learning now because few people engage in solitary work anymore.

The learning process can no longer be described as an individual process because social collaboration has taken priority over individual processes. The capacity to interact effectively is an increasingly important skill that can probably be assessed as a community skill rather than as an individual skill.

In this regard, I need to boost my creativity by moving from my introspective stance in order to find alternative solutions for the co-creative design of education.

My view is no longer that I need to be creative on my own, but instead I look to be co-creative, with the understanding that co-creation is a much more efficient process to illustrate one's learning process. This concept of co-creation thus radically alters the simple design illustrating sole individual creativity, which was my model when I designed the three stages of learning evolution shown in the logo above.

With this realisation, I also understand that there are skills linked to collaborative capacity that can facilitate and boost individual creativity, which are only accessible through specific organisational contexts.

In the new scenario of co-creation, one is interested not only in boosting their individual creative capacity and generating the energy to be creative but also in involving others and being involved by others' forms of creativity in order to multiply, rather than simply sum, the creative contributions.

For example, summing the individual value of each brick that composes the roof of the Dome of Florence cannot represent the value of the dome chapel because probably there is no value for such a building, and even if that value could be estimated, it never could be the same as the individual brick's values added up. In the same way, the sum of values is not the proper calculation for understanding the value of the co-creation process.

For which aim is co-creation required? Education is a service: human society needs to serve people by helping them acquire skills, and this service has to be done in the best possible manner. This is the reason I need to co-create; my biggest challenges cannot be solved by my individual creative process alone.

My challenge is to design a highly effective, well-thought-out service. I need to do a good job in the sector in which I work when I seek to create change. For this reason, I must boost my creativity by sharing this process with other creators, which will, in turn, allow me to multiply my creative capacity. To be truly effective, I cannot work in isolation.

Involving others in my design process will boost my creativity, allowing me to extend "my capacity" to "our capacity". Therefore, I need to first identify the stakeholders I want to involve: who are the other persons or organisations, the other co-designers, with whom I need to interact?

Stakeholders can be viewed in this context as persons or organisations/systems that have some relation to my problem; they can own information and/or represent interests, needs, points of view, experiences, etc. Stakeholders can influence in a positive way what I am doing, and I need to involve them to gain inspiration as well as inspire them to reap the benefits from that interaction.

An interview is a good way to involve a stakeholder with respect to the simple individual creative process. However, I need more, which is to switch on the co-creation process,

creating a two-way interaction and moving to systems and solutions that boost co-creative capacity.

4 How to boost the co-creation process in educational design?

It is not enough to boost the creative process by asking someone a question, recording their answer, and then reading and interpreting the answer in an independent way to get ideas or information. I also need to influence the other person, and I need them to influence me in a purposeful interaction in order to initiate the creative process. This interaction is very important because we need to find common ground with our stakeholders, to share ideas, to use a common language, and, finally, to establish an environment in which the solution flows naturally.

Many times, I have visited companies in order to understand their workflow processes, and for this, it was necessary to use the common language of the workforce. They talked in a certain way and gave names to objects and processes that defined situations, relations, duties, and challenges. To be effective, I needed to familiarise myself with and take ownership of that language.

However, in order to do that, it is first necessary to understand the context. Then it is possible to create something appropriate to that particular context. To give an analogy, if you don't have the ingredients, you cannot make a cake. So the first step is to go to the market and buy the ingredients you need. Then, you need to look at existing cakes, and after that, you can probably create your own cake.

This is just one possible approach; there are many other methods. You can also say "I'll do it in another way", and that is your own creative process.

Each of us has a different approach to creation, to creative moments; it's like a magic moment in which you get "the" idea, but you don't know exactly where that idea is coming from.

We need to use a common language to work together towards common goals, so we need to recognise all the aspects that are important to address in interaction with the stakeholders. Most importantly, because you, as a reader of this text, are my stakeholders, what does it mean for your co-creative involvement?

What key words or ideas come to mind when you hear the term co-creative involvement? Try to capture and write down some ideas of your understanding about the co-creative involvement of stakeholders.

Words such as innovation, solutions, and cooperation might emerge, but you can add any concept that might make your cooperation capacity bigger.

I like the word 'task' in describing the boosting of creativity and creation, because it is important to understand that when we set out to design something, we are talking about services and actions that must be done, and tasks are a crucial part of this.

In education, we design solutions that allow us to take co-ownership of the challenges. We need to communicate, of course, and we need to share the process. I do not know the exact effects of these combinations of factors as I follow them in an empirical mode during the co-creative process, but they are important because they represent a setting for working together. Different settings can be established to foster creative flow.

I mentioned that we need to share power and creative initiative with others. In other words, we seek participation, interdependence, collaborative effort and insight, co-ownership, innovation, and cooperation.

At the centre of this, of course, is that when we have a co-creative approach to design, and when we engage the involvement of others, cooperation is essential: if we don't cooperate with our stakeholders, it is virtually impossible to have co-creation involvement in our educational design.

This is a crucial point to understand. In our lives, we are or we have been students, or learners, as well as maybe trainers, teachers, professors, and so on. In sum, we are engaged in many roles, and when we talk about stakeholders in education, we are not only referring to the two most common components, that is, learners and teachers. We recognise that education has an important role in society in terms of instilling values and guiding the development of children to become responsible citizens. Education aims for citizens to be well informed and competent about their rights and duties, and so on. There are many stakeholders involved in the education chain and process, not just the most obvious two parts.

All these parts have a role in the design of learning processes, learning pathways, instruments, methodologies, evaluations, and so on.

A very simple example to illustrate how these aspects work together is hairdressing design. When you go to your hair salon, the first question the hairdresser poses is: What should we do today? How would you like your hair done? Here, you are invited to say something that indicates a choice, thus an action on your part. You are asked to take responsibility, to choose something, to assess if the decision suits your preferences, and to forecast the results. You have to decide what service you want from your partner, the hairdresser.

Your hairdresser has the tools, the knowledge, the know-how, the capacity to work for you and with you in cutting, colouring, suggesting solutions, helping you develop a strategy, and envisaging a result.

The hairdresser can show you some examples and support you in your decision, and then you make the final decision and say well, I would like this and that, and finally, this is the way you have co-created the solution that best suits you.

However, with such personally intensive services, there is no way to forecast the actual result, to know how satisfied you will feel at the end of the service. If a mistake occurs, you will not be able to go back to the initial condition.

That is a very important point because although you are participating in a co-creative design, there is also the application part, the operations that follow your decisions that have risks, such as having your hair burned, for example, if your hairdresser uses the wrong temperature in the blow dryer.

To apply this analogy to the educational context, we need to think about the two main parts that interact. On one side, we have the experts in education who have the know-how, the tools, the solutions, and the opportunities, and who offer the options.

Our professors are like our hairdressers: we ask them to shape our capacities, and each of us has different requirements in this respect and different demands of the professor, the school, and the educational institution.

There are no two individuals who have the same needs. Each individual has a different expectation of the service they are asking from their professors. The idea that one particular lesson is right for everybody is wrong; we need to individualise the lesson, and the co-creative process must consider the important stakeholders who bring their needs to the table.

In the following slide, on one side is the service provider and their capacities, and on the other side, the client's needs and expectations.

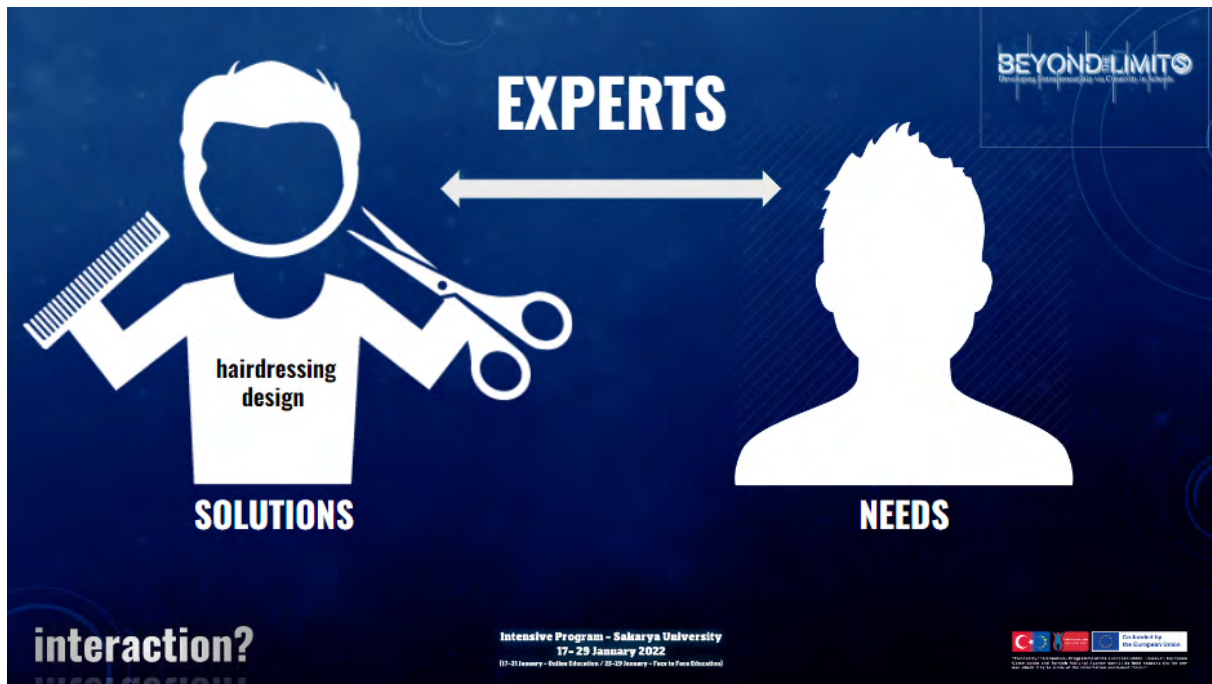


Figure 2. co-creative interaction

The co-creative design in education is mainly based on these two most important parts. Of course, there are many other parts that influence and have a stake in the design. For example, the educational programmes are not determined by the professors, but rather by institutions or government, depending on the country. However, the face-to-face relationships and collaboration ultimately take place between the professors, teachers, trainers, etc. and the learners. They are the two main parts in this process who bring their expertise and needs, respectively.

To illustrate my previous concepts, I offer a practical analogy. I would like you to reflect on the tools you use to make something that the so-called experts in education also use when they design educational pathways: writing a document.

When we design (write) a curriculum, we select a tool for writing, and then maybe we print parts and or we collaborate/interact by talking, and we exchange documents or other material that can help, for example charts, technical sheets, and so on.

In my experience, I have used the typewriter to work and study. I have also used word processors and other writing/co-editing tools such as digital boards, digital mind mapping tools. Which of these tools have you used? What was the transition from typewriting to word processing like for you, as well as the one now to co-editing tools that allow for the digital dimension of the co-creative process?

Even before this new digital dimension opened up, people were co-creating by interacting in person, by phone, by post, etc. Nowadays, people are using more and more

co-editing tools that are offered on the Internet and that accelerate the process greatly, allowing for enhanced and facilitated processes.

Probably, many people who have just started studying or working in this context might find it difficult to understand the difference between co-editing and just using editing tools.

Co-editing tools are not only for writing text; we have today several co-editing tools available on the Internet as web applications, to design workflows, charts, mind maps, presentations, pictures, leaflets, infographics, vectorial graphics, and many more.

5 Using tools to study and work

What opportunities do we have to facilitate the creation, co-creation, and co-designing process using tools, in particular digital tools, to produce documents? As I mentioned previously, to do my work, for example to design a curriculum, I am required to produce a document. The result of my work is something that is written, and thus it is not tangible.

When I started to write my first documents, I used a pen and not a typewriter, which was also available. The typewriter did not allow me to convey effectively the creative writing process I was engaged in by adding notes on the page borders, creating additional papers, attaching extra notes, and drawing arrows, bubbles, underlines, etc. Consequently, I used the typewriter only after the creative process of using pen, pencils, scissors, glue, etc. ended.

In thinking about text creation using a typewriter, the first graphical representation that comes to mind is an arrow indicating that something happens from one point to another, something similar to how we communicate using our natural language.



Figure 3. creativity line

Similar to the typewriter, where it is not possible to delete what has already been typed, when I talk, I cannot move back in time and correct what I just said. I can say: “Oh, sorry, I was wrong, my intention was to say that...”, but because I already said it, I can’t just delete it and replace it with a new sentence. All this happens as a chain composition, the words follow each other in sequence and cannot be changed after they are pronounced.

However, with the advent of word processors (“Word processor program”, 2023), it was possible to easily move parts of the text from one paragraph to another, from one point to another; copying and pasting or deleting was easy and the ability to design text therefore changed dramatically.

The word processor was essentially viewed as a standalone system for writing and editing text, with special functionalities—a sort of magical typewriter with powerful capacities that allowed for new creative opportunities as a sole creator. It was a truly revolutionary tool that also allowed for hyperlinks, bookmarks, and the ability to search and make changes in a very fast way.

The image that comes to mind to represent this creative flow is an irregular shape.

Nowadays, people take for granted these capacities, as word processing functions are fully integrated in almost every text editor available in digital tools, such as smartphones.

However, in recent decades, some of the word processing tools you may have encountered in your writing offer additional functionalities that are intended to boost collaboration and co-creation capacity.

These tools started to emerge in the 1990s with experiences like the WikiProject online. You are no doubt familiar with Wikipedia but may not be acquainted with WIKI (“History of wikis”, 2023), which was a system invented to make it possible for writers to publish in a collaborative manner the information available on the Internet.



Figure 4. WIKI 1994

Today, the WIKI concept is integrated in many writing/publishing tools, as everywhere it is possible to find tools that allow users to add pictures, text, and slogans, creating online content that can be edited and rearranged by other writers.

This opportunity also includes social media and many other platforms where people can collaborate in publishing any kind of media—exchanging information, communicating thoughts, influencing each other’s opinions, and creating new ideas.

The WIKI approach is the basis of the transformation of the word processor, which now offers advanced functionalities to allow and facilitate interaction.

In the following slide, I present, as an example, three of the most famous brands of on-line tools that allow for designing text in a collaborative way.

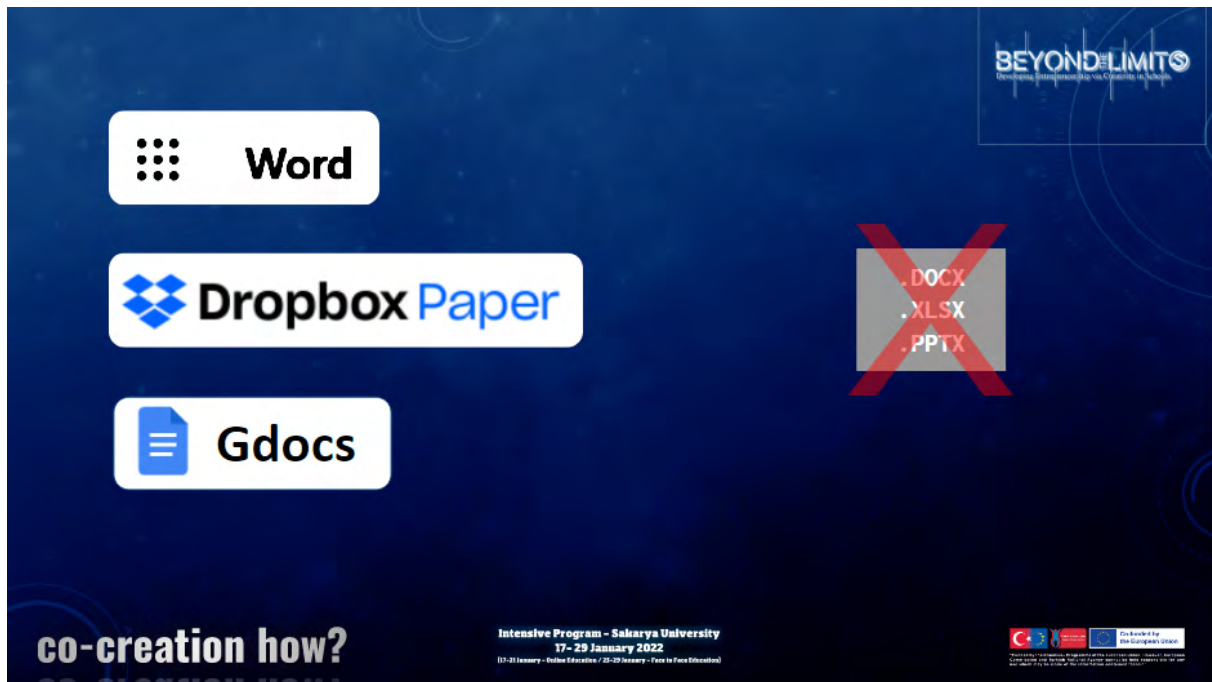


Figure 5. cloud solutions

We can identify the relevant differences between these services provided on the web by the largest technology companies, and, for example, a word processor such as MSWord, which is the standalone software most known in the 1990s and 2000s.

This software can read and write text saved in .doc files and other formats, by one only user per time. Files are opened, edited, and saved in a physical location in a local or remote memory usually owned by the user.

However, with the new services provided by Dropbox Paper, Office 365, or Google Documents, the same information that was located in a local memory and was physically accessible to the user is moved to remote memories such that, in some cases, no one knows where they are physically located, and they are only available through an Internet connection.

With these systems, we have totally lost the physical location of the information. We don't know where the information is, but we can access it from any Internet connection and, most importantly, the new setting allows for accessing the information in contemporary sessions, which means more people reading and editing the same document in real-time.

With collaborative word processors, writers can see what other writers are reading and writing on the same document, at which point of the text other writers have located their cursor to edit and, in real-time, the ongoing text variations.

This information belongs to so-called 'accounts' and can be shared in order to co-design the text in a collaborative manner, revising and improving the text as a group.

This is a significant change in the text creation process because previously, word processors only allowed one editor at a time to work on a document. For this reason, collaboration was done mostly via asynchronous communications among writers. Although live interaction was possible by several authors sitting in front of an individual word processor, this was not a user-friendly solution to collaborative editing as still only one editor at a time could make changes to the document. Therefore, the outstanding feature that the latest versions of collaborative word processors possess is the co-creative dimension.

Google Docs, for example, is one of the tools that gives writers all the functionalities necessary to engage in live and the asynchronous collaboration.

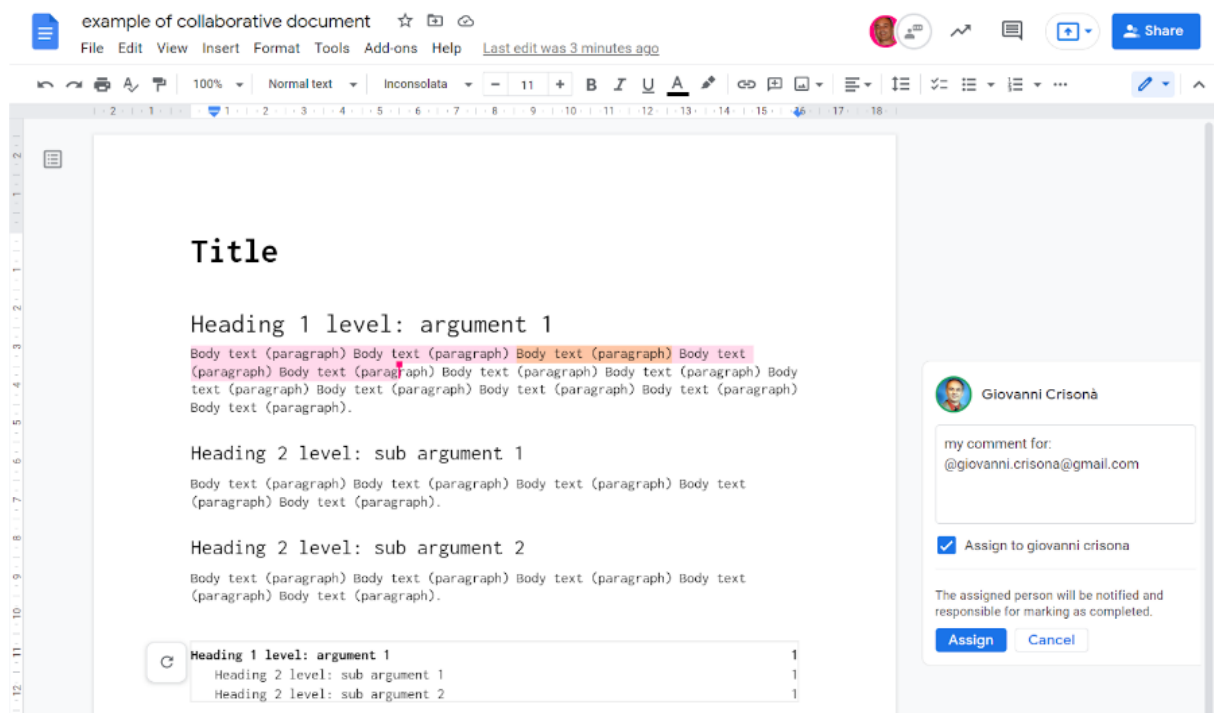


Figure 6. Google solution GDocs

These tools provide various functions, not only the capacity to collaborate in real-time but also to leave comments and assign tasks that reach the involved writers via email, which they can reply to and check off as completed.

These collaborative tools offer, as does the original word processor, a hierarchical organisation of the text to easily format the whole document with simple changes, create summaries, etc. They still lack certain characteristics, but, in general, they offer an excellent level of functionality that, compared with on-time and email-based communication, make them much more convenient than any standalone application.

To deploy the co-creation process using these tools, the author can select the text to be altered, which can be noted by other connected writers, and can leave comments other writers will see in real-time.

Just digitising the character '@' will allow commenters to recall an email identity so that the recipient receives a copy of the comment.

Another very useful service offered by Google Documents is, for example, the possibility to rebuild any version of the document back in time. Every change, even a single character digitised on the keyboard, is recorded in the server, and any author can go back to previous versions, name the version, and restore the version.

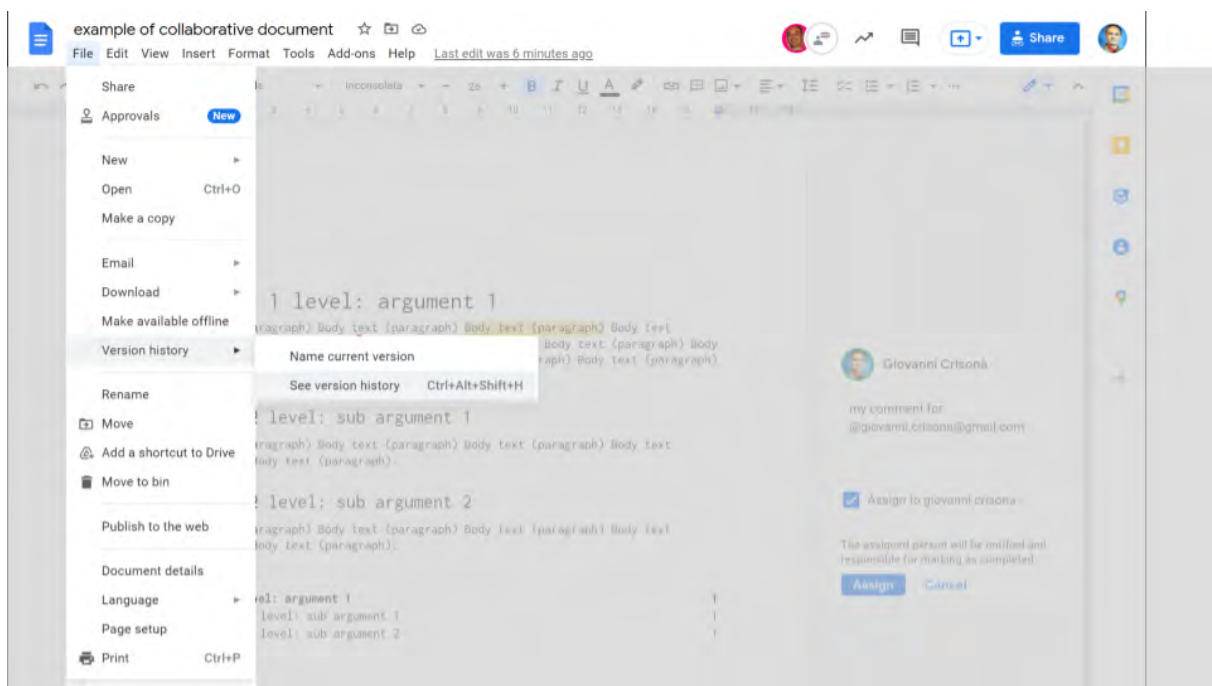


Figure 7. GDocs version history

The version history and the submenu 'see version history' can be found in the menu file. Changes are recorded indicating the author and the time of editing. This functionality gives the option to review past editions and to see what colleagues did within the co-creation/co-creative collaboration.

Before the emergence of digital collaboration tools, there were other possibilities to co-design and co-create. A group gathered in a room, for example, could engage in a brainstorming process using physical boards, stickies, and pinpoints to collect and organise ideas, creating a spatial organisation of the elements. This could also be done using stickers or papers and attaching them to walls, using pinpoints, making maps of ideas, and collecting the created elements in groups, etc. (Greenwald, 2017).

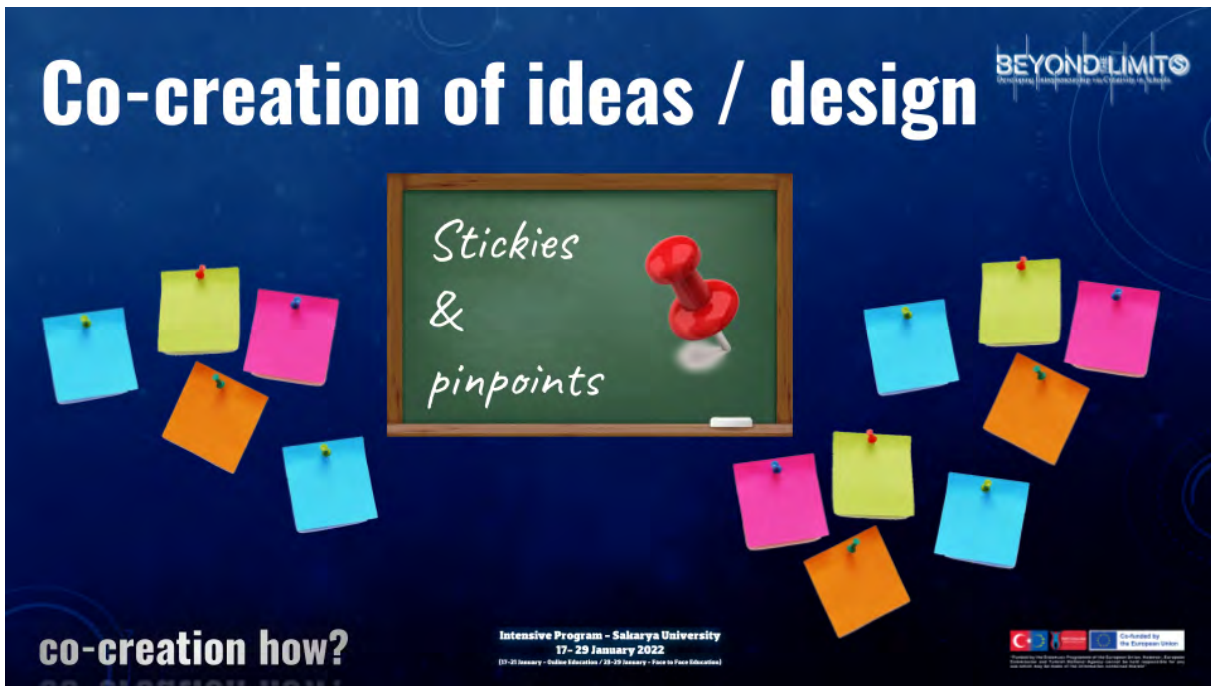


Figure 8. boards, stickies, and pinpoints

Nowadays, all this physical brainstorming is possible online, and there are incredible tools that can support us in this regard. We can make graphics and maps, and most importantly, we can create maps that stand out better in terms of colour and other visual aspects, and we can do it all live while collaborating.

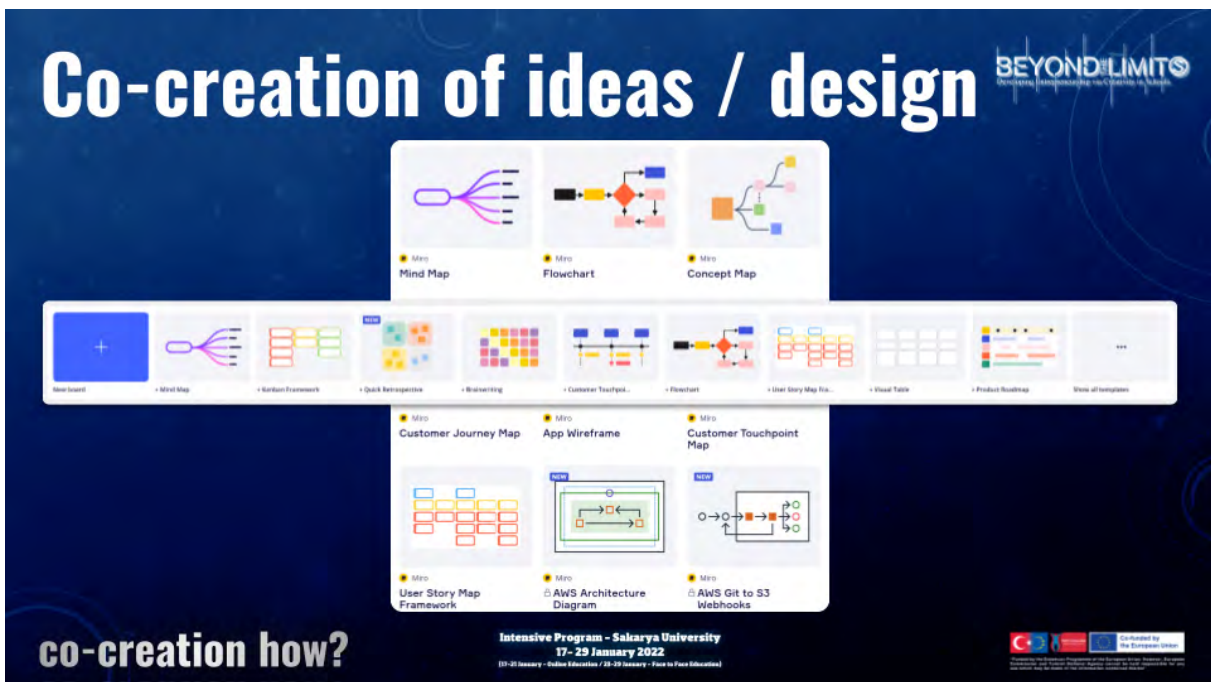


Figure 9. miro.com - online platform

The example in the slide above is Miro, one of the current leaders in the market. It is a tool consisting of several beautiful templates that allows the user to do many collab-

orative activities, such as co-designing, video chatting, sending notifications, making assessments, forming pools, etc.

Another good example is Mural.

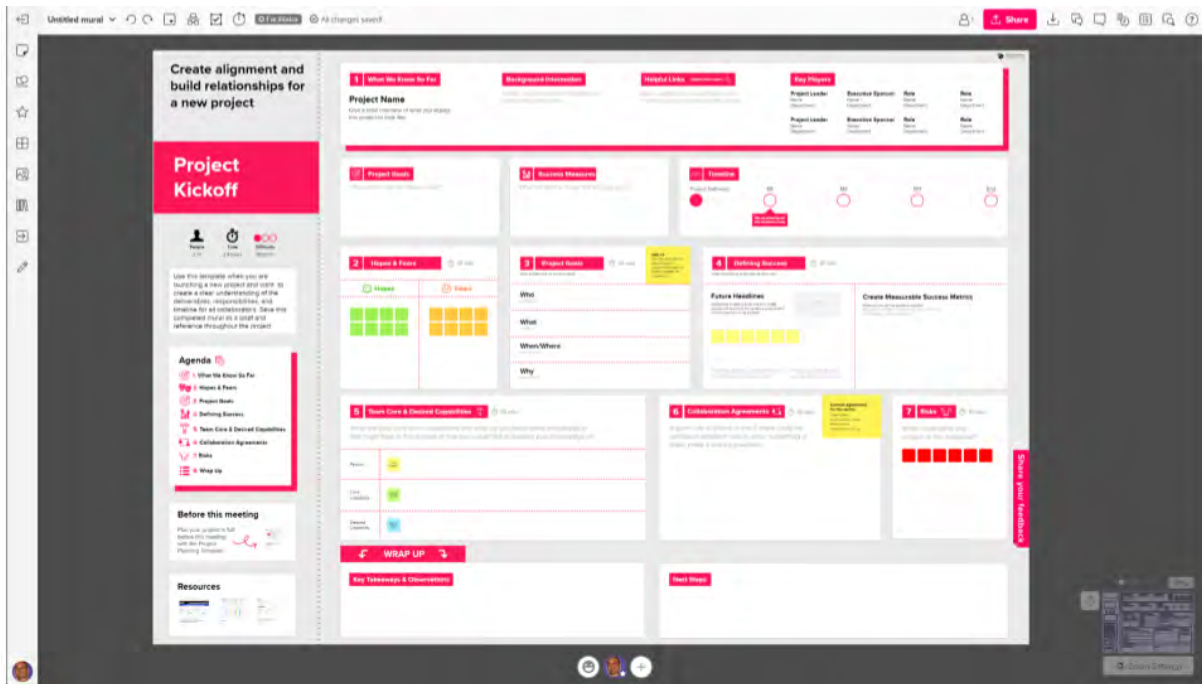


Figure 10. mural.co online platform

This tool is also widespread. Shown here is a board where you can write in a collaborative way, attach sticky notes, add pictures, and so on. There is also a map where you can put your ideas, zoom in and out, move the stickers, etc.

Another example is JamBoard by Google. It is not as complex and powerful as Miro or Mural but rather a very simple digital board where you can put information, text, pictures, and stickies.

6 The creative moment

To conclude this discussion about the tools available to boost the co-creation and co-design of written documents and idea generation broadly, I would like to stress that the many digital tools currently available represent many possibilities in terms of individual suitability.

For each person, the process of creation and design works in a different way. I have learned how to activate this process according to my unique needs.

Creativity is a process that can be activated by providing inputs and allowing possibili-

ties to formulate as outputs. For me, when I start analysing and seeking solutions, it is very important to take inspiration from colours, existing ideas, smells, forms, speech, and other factors that can influence me, such as the experiences of others.

A collection of suggestions is very important. For example, sometimes when I seek to create new ideas, I start from a particular word that attracts my interest in relation to the field. I then do an image search in Google, and many pictures that refer to that word appear.

I scan through the images, exploring freely and openly, much like being in the street and looking around to see what is happening.

I also have my garden available to stimulate inspiration, and both situations are very inspirational for me: Google images and walking through my garden. They are parallel realities and two different experiences, but they both help in initiating my creative process, and the awareness of what can trigger this is an essential part of the process.

It is thus very important to understand and to be aware of how the creative process occurs and when the specific moment of creativity arrives.

The moment of creation is part of a spiritual looping process in that you can continuously extend and revisit it. Instead of leaving this moment to die, you have to relaunch and reboot it, because the creative solutions are continually renewed.

You can accumulate possibilities, and then you can create a new solution growing up from the last one, which you discover was not at all the final step in your creative process.

Starting from the existing parts does not mean that the creative result is to be found in any one part. It means instead receiving the inspiration to create a new part, and so on. When you feel yourself on the right track, you sense that all the components are moving in the right direction, and, at a certain point, you feel like the text is evolving by itself perfectly.

This creative process is very difficult to describe as it happens outside the rational mind. It is instead provoked by the inputs that are in the collaborative basket of ideas and that generate new solutions through the author.

This occurs quite naturally. Inspired and nurtured by the collective information, organisational conditions, and tools, this process can be like a beautiful sight in my garden. Many different inputs can assist the process, such as a talk with someone, a group reflection, or any moment in life. However, the most important approach to stimulate the creative moment is to valorise all the existing information and suggestions, or inputs, in a meaningful way, a way that sparks the creative process.

The creative process is not necessarily easy for every individual, but it can be suitable for any group. In each co-creation process, each one of us can play a valuable role.

In the previous examples, there is an expert—for example, the hairdresser—and there is an owner of needs—the client—and together they can bring the right input to the experience and stimulate ideas and solutions.

The creative process is powerful, but it cannot be improvised. On the contrary, it must be organised, planned, and managed, with appropriate consideration given to time constraints. For this reason, effective task implementation is essential to support and promote co-creation.

Finally, I would like to ask you some questions that may help you find good inspiration:

Is innovation synonymous with creativity? How do you find innovative solutions in your life, work or studies?

What situations in your life, work or studies could be improved by implementing a collaborative know-how approach and who are the other people or organisations, the other co-creators, with whom you need to interact in order to increase your skills?

Have you experimented in your life any co-creation moment and / or how could you reproduce it again?

What opportunities do you have to facilitate the process of creation, co-creation and co-design using tools, especially digital tools for your life, work and/or study?

For each of us, the process of creation and design works in a different way. In what way does it work for you?

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Creative Learning for Entrepreneurship

This book was created as a learning resource which enables readers to develop their understanding and skills in creativity and entrepreneurship. It is written for anyone interested in creativity, entrepreneurship, education and learning, and in how these topics interconnect. It can be used by individual readers, students, educators, researchers, and people working in enterprise and small business support. In education, it is intended mainly for use at advanced and higher education levels.

The book was created as part of the European Erasmus project, 'Beyond the Limits – Developing Entrepreneurship via Creativity' which ran from 2020 to 2023. The 18 chapters were written by leaders, authorities and innovators in creativity, entrepreneurship and learning.

The book is organised in four themes, each of which comprises four or five chapters. All the chapters can be read and used freely and separately as educational and teaching resources.

1. Creative entrepreneurship and human development
2. Pedagogies for creative learning and education
3. Pedagogies for entrepreneurial learning and education
4. Social, community, and collective learning for creativity and enterprise.