

What does creativity mean?

BASIC PRINCIPLES AND THEIR PRACTICAL CONSEQUENCES

Rainer Holm-Hadulla

The author summarises historical and philosophical concepts of creativity and explains the interplay between talent, knowledge and skills, motivation, personality traits and environmental conditions.

Creativity is the word on everyone's lips: we are always hearing that we should be fostering it in early childhood and at school. Extraordinarily creative artists and scientists are admired. Creativity is also seen as important in shaping everyday life. How we drink our morning coffee, whether we gulp it down and get indigestion, or whether we breathe in its aroma, thinking of last night's dream and the smile of a loved one: that is lived creativity; it is an elixir of life. However, it does not materialise of its own accord. You have to look for it, make an effort for it, and remove many obstacles on the way towards a creative life.

Myths, religions, philosophies

In all cultures there is a debate with creativity. In myths, religions and philosophies people communicate ideas about themselves and their place in the world. In Ancient Egypt as well as in early Far Eastern high cultures creativity appears to be the result of a battle between constructive and destructive forces. In the Bible, too, there is not only a creator god but also a destructive principle, embodied by the devil, which propels human deeds. The famous German poet Goethe sums this up ironically: "Man's energies all too soon seek the level, / He quickly desires

unbroken slumber, / So I give him you to join the number, / To move, and work, and pass for the devil."¹ Creativity is therefore not only considered a gift of the muses but also the expression of a conflict between opposing powers. This idea is also present in many philosophies: human development is only made possible through a clash of constructive and destructive tendencies. However we evaluate this in terms of cultural history, in terms of fostering creativity it is important to accept that creativity is not just fun. The dialectic of the creative process has deep cultural roots: the interplay between actively designing and passively letting things happen. "Creavit" – he created – the first verb in the Bible intones the idea of creativity as an act of creation that is individual, independent and unique. In the Western world in particular this idea has developed into a guiding principle: ingenious people create extraordinary works – inspired by the divine spark or kissed by the muses. However, another idea resonates etymologically in "creativity": "allowing something to grow and happen". This is still significant today, particularly in Far Eastern cultures. Humans are not just creative through their unique activity; they also integrate themselves into a collective process through their creative activity. In contrast to Western ideals of creative individuality and originality, for thousands of years in China, for example, there has been the guiding principle that creativity happens in a collective and repetitive process. It is not the person who is individual and original who is the scholar or senior manager but the person who best integrates him-/herself

with the tradition and subordinates him-/herself to the community. This ancient Confucian idea is still today a guiding principle in Chinese science, economics and politics.

In all cultures there is a widespread idea that people must be constantly active in order to keep the world going. In philosophy this guiding principle appears in the Western world at the latest with Heraclitus as the idea that people move within a dialectical process between becoming and decaying, construction and deconstruction. A certain degree of destabilisation of habitual structures is regarded as something that promotes development and creativity. The German philosopher Nietzsche summarised this as follows: "One must still have chaos within oneself to be able to give birth to a dancing star."²

(Neuro-)biology and psychology

Modern sciences have researched interesting aspects of creative processes. From a biological point of view, creativity is a characteristic of life. Simple organisms already live within a constant process of exchange with their environment. Even as a baby develops in the womb s/he is exposed to stimuli that s/he not only stores but also reacts to. The infant is constantly receiving impressions from his/her internal and external worlds. S/he does not simply store these, rather s/he develops in constant exchange with these. It is no metaphorical exaggeration to say that every baby composes his/her world.

As the brain organises itself it gives rise to neural networks, closely interacting with the physical internal world and the social environment. In this way, events are subjected to neural ordering and stored as memories. In the creative process these structures, without which nothing new can emerge, are repeatedly destabilised and recombined. Perception, memory, thinking, imagining and dreaming are creative processes that stimulate the maturation of the brain and are closely connected to a supporting environment. It has been proved that even in old age creative activities stimulate the brain function and promote neural plasticity. From a neurological point of view, creativity can be defined as "restructuring of predetermined information". Information must be stored by neurons so that it can be newly combined in original ways. It is not enough if it is stored somewhere on the Internet or in

another external media. Furthermore, creative thinking and behaviour requires quiet spaces for development in which what has been learned can be newly combined. In a state of quiet reflection that oscillates between concentration and distraction new neural networks are constantly developing: when the brain is in resting mode, self-organising processes take place that combine what has been experienced and learned into new patterns. This mode is often accom-

panied by feelings of reluctance, particularly when the expected solution has not been found. Feelings of pleasure and flow only arise when these tensions are overcome and lead to new and useful results. This is a neurobiological equivalent to the often cited experience that creative activities are not only fun but are also connected with struggle.

Psychological creativity research differentiates between 5 principles of creativity: talent, knowledge and skills respectively, motivation, personality traits and environmental conditions (see blue box following this article). Talents cannot be reared, they must be discovered. That is only successful if they have the space in which to develop. Intelligence is not unimportant to creativity. However, beyond an IQ of 120, which indicates above-average intelligence, creativity does not increase any further. Intellectually

gifted people, e.g. upwards of an IQ of 135, are not more creative than intellectually able people. Neither are they socially more incompetent or even more psychologically impaired. Other factors, then, such as industriousness, contribute to intelligence, leading to necessary knowledge and specialist skills. Furthermore, intrinsic interest, the motivation to dedicate oneself passionately to something for its own sake, is of great importance. The personality traits that are emphasised are the successful interplay of self-will and adaptability as well as openness and the capacity to resist. A favourable environment allows talents to unfold by making available structures in which knowledge and skills can be gained, and at the same time offering space in which what has been learned can be newly combined. Peace and quiet is needed for this, sometimes even boredom. The creative incubation period is also, from a psychological point of view, connected with unavoidable states of stress. If the sometimes tortuous searching in this phase is interrupted through media-related distraction, or if an attempt is made to manipulate the stress using excessive amounts of alcohol or drugs, the creative process is generally damaged.

Creativity in different life phases

In different life phases the development of creativity requires different stimuli and environmental conditions. For children at the infant or toddler stage, secure relationships and attention are of fundamental importance. In secure relationships children begin early on in their lives to imagine and play freely and independently. For this they need protected space and competent recognition. The loving and appreciative gaze of the mother and other carers is an essential stimulant in creative development. These internalised experiences of

relationships are further developed and modified through later experiences. The interplay between learning and playing, concentration and distraction, conscious thinking and intuitive imagining is dependent on the recognition of their fellow human beings. Competent recognition is the best support for the highly talented: it helps making appropriate offers and fosters emerging talents.

Puberty is a phase of creative change that frequently pushes young people and their environment to breaking point. For example, just as the brain reorganises itself, and nerve fibres lose their old structures and build new ones, so does the physical and social self form itself in a new way. In this phase, too, it is important to foster talents, knowledge, skills and motivations in a flexible way. The balance must constantly be struck between freedom for wilful intuition and disciplined learning. That continues in training and university study, and it culminates in mature adulthood up to the fortieth year of life typically in an excess of duties: professional careers are forged, relationships become more binding, and people start having families. During this time people often lose their childish playfulness and their youthful originality. They become personally more grounded and socially more integrated, but they often pay the price of their creative resources drying up. If things go well they can still find spaces for themselves and also use it. Then, growing older equals not only

a loss of physical and mental capacities but also a chance to enjoy and cultivate the creative dimensions of daily life: a vivid memory, becoming absorbed in cloud formations, or the image of a loved one. Mindfulness to reality in all its sad and beautiful aspects can still be learned in old age and is accompanied by improved neural plasticity and increased well-being.

Creative moments in everyday life

Sensitivity to music, art and science is also connected to paying attention to the creative moments of everyday life. Creativity is not a beautiful luxury for leisure time but an elixir of life. If you set yourself this task everyday routines become more bearable, and sometimes they even become sources of creative insight. In the interplay between structured work and free imagination, between knowledge and intuition, structure and freedom, what is needed is self-respect and appreciation, but also the capacity to resist. Ultimately the acceptance of the everyday "Die and become" (Goethe) is the essential requirement for encountering the world creatively.

The concrete creative processes differ significantly in their domains. Let's take poetry and science as a contrasting pair. Poets work constantly with their intuition and subjective experience.

By contrast, scientists abstract from their individual selves and concentrate on well-defined tasks. Original insights are significantly scarcer, and the development phase lasts, as Nobel Prize winners repeatedly report, mostly years or decades.

Prominent example: Bill Gates

The interplay between individual characteristics, environmental factors and organisational framework conditions can be illustrated using the prominent example of Bill Gates. He was supported as a child, he was hard working, and at college he showed he had a talent for logic and maths. Moreover, he also found space to implement his ideas playfully and with focus. That is how he was able to start his first company at the age of 16. He was driven by curiosity, and he was prepared to accept defeats, too. This is why the failure of his first company led only temporarily to withdrawal and resignation; instead it strengthened his interest and industriousness. His non-conformism was also noticeable in, for instance, how at Harvard University he did not attend many compulsory courses, preferring to attend predominantly the seminars that inspired him at the time. However, Bill Gates advises all pupils today to acquire solid specialist knowledge if they want to make an innovative impact one day. Specialist knowledge, though, should be supplemented with different kinds of cultural activities in order to enable scientific and entrepreneurial creativity.

Discipline and playfulness are not opposites for Bill Gates, but 2 sides of the same coin. Already as a child, with loving, caring parents, his rebellious tendencies were apparent to the extent that his parents sought professional help for him when he was 12 years old. Gates made use of the counselling for his own ends. Later, too, he found companions such as his friend Paul Allen with whom he founded the global corporation Microsoft. Like the Apple founder Steve Jobs with his friend Steve Wozniak, he had found an older friend who shared his interests. Both tried to continually improve themselves; they mutually supported their "intrinsic interest", i.e. the things they had set out to master as far

as possible. That was a prerequisite for their success. In addition, they lived in an environment and at a time in which their products were needed and valued. From this and similar biographies we can conclude that everyone has the task of implementing his/her talents with motivation and perseverance, and of finding or creating the appropriate space for this. It is just as important that companies and institutions create the conditions in which individual talents can emerge. Competence, discipline and team orientation must be continually rebalanced with playfulness, originality and individuality. New and useful products come about by appropriating and developing existing knowledge and skills. Creativity is part of the immaterial capital that does not appear on any balance sheet but is nonetheless one of the most important assets of a company. Entrepreneurial creativity involves, *inter alia*, detecting real needs but also unexpressed desires, and offering solutions. In this sense, curiosity, courage and confidence but also solid knowledge, caution and self-criticism are important prerequisites for entrepreneurial creativity.

Prerequisite for entrepreneurial creativity

A business climate that allows space for creative talents to emerge plays a significant role. An important guiding principle in managing staff is the interplay of structure and dynamics: clear hierarchies, transparent division of tasks, secure working conditions but also opportunities for spontaneous exchange, individual job design, and certain incentives, particularly in the form of recognition.

There is creative potential in respectfully practising this variety. The modern science manager unifies both aspects in himself. However, at times it can be difficult to balance out these aspects, and there should be space for the specialists.

Recognition as a key concept

Recognition is a key concept in fostering creativity. It must be factually competent and emotionally authentic. A climate of openness and trust is certainly supportive. However, we should not underestimate classic, sometimes disdained virtues such as industriousness, discipline and organisation. Original solutions frequently grow from concentrated, meticulous and often also obstinate work. The peak of entrepreneurial creativity is the invention of a new and useful product as well as its implementation as innovation and market success. This success, though, after all we have learned from biographical and scientific studies, does not come about by being kissed by the muses: it is due to high-level specialist competences and corresponding knowledge that are creatively ignited under certain conditions. Environmental conditions play an extremely important role in science and economics. Brilliant creative professionals modestly stress again and again that being able to work on a product that is becoming successful at this precise moment is about being in the right place at the right time with the right people.

Big organisations' ability to learn

To get an overview of, and to design, multi-layered scientific and economic systems, complexity must be reduced and results and risks must be controlled. It is also about big organisations' ability to learn: this does not mean occasional creative highlights but an enduring willingness to grow and change. This willingness is fostered by the following management competencies: clear and attractive visions, appreciative communication and incentives for operational and personal development. Visibly practising this value system, respect for the individual,

and concentration on core competencies and simple but flexible job design are the essential components of "tight-loose management".

Global competition strengthens the flow of information and the willingness to innovate. It can, however, also lead to an unproductive hectic pace that does not allow creative ideas and products to mature sufficiently. On the organisational level, too, the guiding principle should be to balance structure and dynamics: certainty, clarity and calmness are just as important as the willingness to change, passion for experimentation, and productive restlessness. Staff should have the opportunity to shape their area of work to their own as well as the company's advantage. ■

NOTES

¹ <http://www.poetryintranslation.com/PITBR/GermanFausthome.htm>. [28.12.14].

² Thus Spake Zarathustra prologue, sec. 5 (1883) (translation by Walter Kaufmann).

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THE AUTHOR

Rainer Holm-Hadulla, Dr. med., is a creativity researcher, advisor and Professor for Psychotherapeutic Medicine at the University of Heidelberg, Germany, and at the Diego Portales University in Santiago de Chile, Chile.



The creative personality

Main factors

Talent

One of the main factors determining the creative personality is innate talent, e.g. having strongly pronounced logical-mathematical thinking skills or musical talent. Even though there are well-known families with an apparently inherited genius in a particular direction (e.g. the Bach family in the field of music or the Bohr family in the natural sciences), scholars are now sure that creativity is not innate and is not genetically hereditary.

The age at which particular talents become visible varies greatly: artistic talent in music and painting, for example, expresses itself already in early childhood and youth. Scientific talents, however, become apparent very late on: mathematical talent becomes apparent around age 20, talent for the natural sciences around age 30, arts and humanities scholars, politicians and entrepreneurs reach their creative peak towards old age, and in literature and philosophy, too, creative late works are not uncommon.

Motivation

Talent alone, however, is not enough. Motivational factors, too, such as curiosity, interest and ambition have a great impact on the creative personality.

Personality traits

Psychological research specifies the personality traits that foster the creative personality (Funke, 2000):

- independence
- non-conformism
- broad interests
- openness to new experiences
- willingness to take risks

Environmental conditions

From a developmental psychology point of view, being accompanied by

a lovingly supportive attachment figure and having secure bonds promotes the development of creativity. Yet adversity in the past and unfavourable influences (e.g. difficult family relationships or an illness) can also produce positive impulses.

The freedom to make decisions, positive confirmation, and stimulating teams proved to be beneficial in promoting the development of creative potential in science. Pressure from colleagues and the anticipation of an evaluation and supervision inhibit creativity. Scientific studies have also proved that cultural diversity fosters creativity and better results are achieved in ethnically diverse groups than in homogenous groups.

Knowledge

New ideas arise through the appropriation and development of already available knowledge and skills. Specialist knowledge is therefore the foundation for working creatively, for it is only possible to creatively newly combine what is already stored in the mind.

Factors that play a part in fostering creativity

From a psychological perspective, the following factors play a part in fostering creativity:

- intrinsic motivation
- non-conformism
- self-discipline
- belief in your own idea
- ability to accept criticism
- careful choice of suitable fields of work
- divergent thinking that takes tradition into account
- qualified co-workers
- personal commitment to creative enterprise

The interplay

Creative production comes from the interplay between talent, motivation, personality and framework conditions. It can be described by the following factors:

- **Flexibility:** the ability and willingness to have new experiences
- **Associative thinking:** the “creative leap” frequently occurs when things are seen from an unusual perspective
- **Self-confidence:** going off the beaten track frequently destabilises creative people’s self-confidence. It must be reinforced
- **Focus on objectives:** concentrating on achievable goals is an existential component of successful work
- **Intelligence:** the ability to register and produce concrete and abstract relationships
- **Non-conformism:** a sceptical attitude towards conventional beliefs
- **Authenticity:** the feeling you are making a meaningful contribution
- **Transcendence:** the realisation of values beyond egotistical needs
- **Interest:** being there and taking part, the willingness to dedicate oneself to something for its own sake
- **Originality:** uniqueness, integrity, authenticity as the result of creative work
- **Curiosity:** the need to learn or make something new as an expression of vitality, balancing this with what is certain and established.

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