Creativity's guidelines: building creative thinking

Os sentidos da Criatividade: a construção do pensamento criativo

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Abstract
This work aimed to establish what is meant by creativity, starting with old concepts and definitions. For this, the guidelines of creativity were explored, that is, the main elements that compose it. It was decided to explore further the definition of the Dimensions of Creativity (Rhodes, 1961), better known as the 4 Ps of creativity. It is divided into four dimensions that guide the definitions of creativity at present: Person, Process, Product and Press. The dimension of the creative person takes into account their values, emotions, habits, and behaviors; the creative process considers perception, imagination, motivation, learning, communication and creative thinking; the creative product approaches ideas, discoveries, arts and theories; and the creative press, the environmental and cultural influences, involves education and culture.
Keywords: creativity; definitions of creativity; elements of creativity; dimensions of creativity.

Resumo
Este trabalho teve como objetivo estabelecer o que se entende por criatividade, partindo de antigos conceitos e definições. Para tal, exploraram-se os sentidos da criatividade, ou seja, os principais elementos que a compõem. Optou-se por explorar mais a fundo a definição das *Dimensões da Criatividade* de Rhodes (1961), mais conhecida como os *4 Ps da criatividade*. Ela se divide em quatro dimensões que orientam as definições de criatividade na atualidade, sendo elas: *Person*, *Process*, *Product* e *Press*. A dimensão da pessoa criativa tem em conta seus valores, emoções, hábitos e comportamentos; a do processo criativo considera a percepção, imaginação, motivação, aprendizado, comunicação e pensamento criativo; a do produto criativo aborda ideias, descobertas, artes e teorias; e a das influências ambientais e culturais envolve a educação e a cultura.
Palavras-chave: criatividade; definições de criatividade; elementos da criatividade; dimensões da criatividade.

Resumen
Este trabajo tuvo como objetivo establecer o qué se entiende por creatividad, a partir de antigos conceptos y definiciones. Se decidió explorar com mayor detalle la definición de las Dimensiones de la Creatividad de Rhodes (1961), mejor conocida como los 4 P de la creatividad. Se divide en cuatro dimensiones que guían las definiciones de creatividad en la actualidad: Persona, Proceso, Producto y Ambiente. La dimensión de la persona creativa toma en cuenta sus valores, emociones, hábitos y comportamientos; el proceso creativo considera la percepción, la imaginación, la motivación, el aprendizaje, la comunicación y el pensamiento creativo; El producto creativo aborda ideas, descubrimientos, artes y teorías; y el ambiente las influencias ambientales y culturales, la educación y la cultura.
Palabras clave: creatividad; definiciones de creatividad; elementos de la creatividad; Dimensiones de la creatividad.

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Creativity

To understand creativity, we must first understand its meaning and its emergence. The study of creativity is relatively recent; it is only officially born in 1950 when J. P. Guilford points to the importance of exploiting creativity as an independent field of knowledge (Sternberg & O'Hara, 1999; Guilera, 2011; Garcês, Pocinho, Neves de Jesus & Viseu, 2016).

Few things shape the human experience as deeply and extensively as creativity. Creativity guides progress in every human endeavor, from the arts to the sciences, business, and technology. We celebrate and honor people for their creativity, identifying celebrated individuals, as well as entire cultures and societies, for their creative achievements. Creativity is the vehicle of self-expression and part of what makes us who we are (Paul & Kaufman, 2014, p.3).

The concept of creativity has suffered several modifications over time. The greatest of all came after the ideas of Charles Darwin when start to believe that creative individuals inherited the creative genes of their ancestors (Dacey, 1999). Darwin would contribute to the scientific advance, and later, when approaching processes underlying the process of natural selection, it allowed a new horizon on the characteristics of creativity, especially as regards its importance for the adaptation process.

The search for the meaning of the creative phenomenon has brought new ideas for its study, but there are still many questions that remain unanswered (Garcês et al, 2016). Although anyone judges himself capable of recognizing creativity when he sees it, there is no consensus as to his definition, since the understandings of creativity are filtered through the culture, context, experiences, values, beliefs, and other particular characteristics of the individual (Cramond, 2008). In this way, to better understand the creativity, we will explore some of your guidelines.

The Creative Act and its Guidelines

These theories arose from the observation and analysis of behaviors and characteristics, finding elements in common between the theories that served as guiding the direction of the creative thought, and, later, as the fundamental base of the creativity (Plucker, Beghetto & Dow, 2004). That is, every creative act, even implicitly, will have these elements.

According to Johnson (2010, p. 21), this is because "when life becomes creative, it tends to gravitate toward certain recurrent patterns, whether they are emergent and self-organizing, or deliberately fabricated by human agents". However, these elements do not seek to define creativity by itself, but rather to provide a better understanding of the creative act.

Creativity and Novelty

The essential element of novelty appears in almost every definition of creativity. One of the main reasons for the novelty to be related to creativity is that, in order to define creativity, it is necessary to define what is considered *new* (Goswami, 2015).

The *new* means that which has never manifested before, but also the emergence or attribution of a *new meaning* (Walia, 2019). According to Johnson (2010), in order to emerge a new meaning, one must consider the context of the creative act, since this context constitutes a fundamental factor in the definition of this new meaning.

However, not only is something new, it is necessary that the result of this creation, besides being new, offers some new social or personal value, and may

also be considered *useful, appropriate or effective* (Paul & Kaufman, 2014; Walia, 2019). Goswami (2015) defined as *situational creativity* what refers to the creation of a new product or to the solution of a problem so that this new meaning is inserted in one or more old contexts, which means, the subjective exploration of new meaning in ancient contexts, culminating in a surprise. The *fundamental creativity* consists in the creativity that refers to the manifestation of some new product in a new context, which means, a new context that manifests a new product or idea.

The element of novelty in creativity depends on where that creation is inserted and contextualized. The new will depend not only on what is created but also on where and why it was created, adding value and meaning to the individuals and/or environment where they are found.

Creativity and Intelligence

Another factor recurrently associated with creativity is intelligence. There are several models that relates creativity and intelligence, but creativity don't seems to have a strong importance in the intelligence field (Plucker, Esping, Kaufman & Avitia, 2015; Sternberg, Kaufman & Roberts, 2019).

J. P. Guilford was the author who had the greatest influence on the study of creativity and its relationship with intelligence, besides being responsible for distinguishing creativity as a field of study (Guilera, 2011; Kentor, 2016). At first, researchers were somewhat fascinated with individual creativity, more specific with geniuses (Amabile, 2017), but of all his works, the one that had the greatest impact on creativity was *Divergent Thinking*, where Guilford explains that conventional intelligence tests were not ideal for measuring creativity, which would later be explored by other researchers (Nakano & Wechsler, 2018).

While we may consider creativity as part of intelligence and vice versa, another way of looking at the relationship between intelligence and creativity is by considering them as two complementary capacities (Sternberg & O'Hara, 1999; Plucker et al, 2015). However, the correlation between intelligence and creativity is variable; what will distinguish the creative person will be their mental fluidity and their ability to generate a large number of alternatives, while the intelligent person will be identified by their ability to choose the best available alternative (Guilera, 2011; Baer, 2016).

Creativity and Problem-Solving

Problem-solving is considered as "a cognitive process oriented towards the transformation of a situation that becomes an objective when the decision-maker has no obvious method of solution to do so" (Mayer, 1999, p.437).

However, the term *problem* is as vague as a *novelty*. Creativity is not a mere process and it is possible to identify problem-solving as an element belonging to it, since problem-solving has a specific objective, presented in a logical order and with a systematic approach to be solved; even in the creative process, there is not necessarily an objective, and the individual can be guided by an intuition or guess, and the use of unconventional models of thought is common (Sternberg & O'Hara, 1999; Baer, 2016).

To better understand this difference, it is important to differentiate a routine problem from a creative problem: in the routine problem the individual will rely on similar prior experiences, and the creative problem will not necessarily present a prior experience, leading him to create a new solution (Sarathy, 2018). What distinguishes the solution of routine problems of creative thinking is not only

the solution of a problem but also the attribution of a new meaning to it (Goswami, 2015).

In this sense, problem-solving presents less complexity, and considering creativity as a sort of problem-solving does not bring any benefit to its understanding, since creativity is a phenomenon composed of many more elements.

The Possible Adjacent

The influence of Darwin's ideas in the field of creativity led us to believe that the difference between creative and non-creative individuals could be in their biologically distinct brains or in their genetic code (Dacey, 1999; Sawyer, 2006). However, the awakening of creativity is associated with the growth of complex social groupings that emerged during the development of the human being through a complex and long-term process strongly influenced by the environment (Johnson, 2010; Cabrera, 2018).

Darwin's evolutionary theory was, above all, a theory about the creative force of evolution, which would later enable us to explain some creative phenomena. Kauffman (2016) has observed an evolutionary pattern in which, as chemical reactions occur that give rise to new molecules, new possibilities of reactions and combinations are created, where the combinations of elements result in possible future combinations. Kauffman has named this phenomenon *Possible Adjacent*. This pattern can be observed in the evolution of the biosphere, but also in the economy and in everyday life. However, Johnson extrapolated this concept to the understanding of creativity, where he explains that:

[The Possible Adjacent] captures both the boundaries and the creative potential of change and innovation. (...) is a kind of spectral future, hovering on the edges of the present state of affairs, a map of all the ways in which the present can reinvent itself. It is not, however, an infinite space, or a totally open playing field. (...) The possible adjacent reveals that at any moment the world is capable of extraordinary changes, but only certain changes can happen (Johnson, 2010, p.30).

Our world is open, radically emerging, and like the biosphere, can flow into a Possible Adjacent often unintentional and unpredictable, but we collaborate to make it happen (Kauffman, 2016). Thus, the dynamics between the individual and the environment is one of the most important questions in the analysis of creativity, since creativity is the result of the interaction between the person, the task and the environment (Sternberg & O'Hara, 1999; Garcês et al, 2016). Not only the place but also the time in which we grow make to a difference.

We all live within our own possible adjacent versions. We are surrounded by new potential configurations, new ways of escaping from the routine. The challenge is to find ways to explore the limits of possibility around us.

The dimensions of creativity: the 4 Ps theory

As already mentioned, the definition of creativity is involved in a certain *mystery* because of its complexity, since responding to *what creativity is* would be as complex as answering a philosophical question (Paul & Kaufman, 2014). However, despite the initial idea of the Guilford's Structure of Intellect Model, it was Rhodes (1961) who noted that there was a confluence between the various definitions of creativity and that these seemingly distinct definitions could be grouped into four large dimensions (Garcês et al, 2016). These dimensions

became known as the *4 Ps* of creativity: *Person, Process, Product* and *Press*.

These four dimensions guide the definitions of creativity today, and can be described as: the creative person, taking into account their values, emotions, habits, and behaviors; the creative process, through perception, imagination, motivation, learning, communication and creative thinking; the creative product, such as ideas, discoveries, arts and theories; and environmental and cultural influences, involving education and culture (Dias et al, 2004; Cabrera, 2018).

This new way of looking at creativity has allowed us to see it in a viable, intuitive and organized way (Cabrera, 2018). However, it is important to remember that although it is possible to study the 4 Ps separately to better understand its elements, we must not forget that they are not separate phenomena since the 4 Ps operate together (Garcês et al, 2016).

The 4 Ps of creativity classified by Rhodes (1961) offers an integral and comprehensive vision of creativity. This schematic approach is useful in interpreting the nature of creativity both from an empirical and practical point of view. Then, being the creative act the fruit of the individual inserted in a particular context, it was sought to explore next especially the dimensions of the Person and the Press, which will allow a better understanding of the creative phenomenon.

The Creative Person

The personality configuration of a creative individual, although not yet fully defined, reflects some traits that stand out and favor creative thinking (Simonton, 2000; Alencar, 2016). "Certain personality traits are the cause of creativity," explains Goswami, "as, for example, the ability to visualize and imagine, to take risks, to be persistent, to have divergent thinking and a good memory" (2015, p. 235). Also, creative individuals have a strong imagination, self-confidence, originality, and determination, because creative thinking is innovative, exploratory, and adventurous (Sarathy, 2018; Runco, 2019).

For Alencar (2016), the main characteristics of the creative individual are *autonomy, independence, personal flexibility* and *openness to experience* - fundamental attributes that facilitate the individual to reformulate judgments or ideas previously formed about something; *self-confidence, initiative* and *persistence* - because a confident individual tends to be less resistant to risk, which is essential when one intends to go beyond what is known and persists towards the desired goals; and *emotional sensitivity*, the ability to extrapolate the rules of logic and experience new possibilities.

Based on these traits, some tests have been created to measure people's creative potential, which attributes creativity to the IQ test (Plucker et al, 2015).

Tests widely used by creativity researchers EP Torrance (1988) and JP Guilford (1959) emphasize how a person learns and thinks, and whether we tend to think of a problem in a variety of ways or to quickly focus on a specific mode; that is, whether the person's style of cognition is divergent or convergent. (...) I believe that creative people use divergent thinking, but they process it in the unconscious. They allow unresolved ambiguities to proliferate through unconscious processing. So when the time comes, when creative ideas are born, they use convergent thinking to manifest the creative act (Goswami, 2015, p. 236).

The tests help the interpretation of the individual and his creative process, but these results are not enough since it is difficult to establish practical criteria on what one should or should not consider creativity. The creative person should be roughly analyzed by his originality, which

represents the broadest of the traits that enter into creativity.

In other words, creative people can redefine a problem or idea that another person has presented or that they have previously perceived in a completely different way since the exercise of creative potential is linked to the individual's behavior and personality (Sternberg & O'Hara, 1999; Sternberg et al, 2019). According to Guilera, "the creativity of a person lies in the conjunction of an attitude, a set of skills and the way of working following a set of rules, techniques, and methods" (2011, p.31).

However, personal creativity does not only arise with the knowledge of resources and revenues; the environment will influence the individual significantly since his thinking shapes the spaces he inhabits, and spaces will influence the individual (Johnson, 2010; Sawyer, 2006). The individual always creates inserted in contexts, and a better understanding of these contexts is essential for a more complete explanation of creativity.

The Creative Press

Creativity has long been seen as a process that happens only in the mind of a single individual endowed with characteristics and traits specific to such development (Simonton, 2000; Runco, 2019). It was verified that the environment exerts a great influence on the creative thought, being a decisive factor to provide opportunities so that the ideas emerge freely, in innovative environments that guide the individual to create and to think creatively (Guilera, 2011; Simonton, 2019).

The creative *press* represents the relationship between the person and the environment, where it will form ideas to respond to needs, sensations, perceptions, and imagination, so that it receives stimulus from both internal and external sources, perceiving its environment in a unique way (Rhodes, 1961; Cabrera, 2018). Creativity is not something apart from the world; it originates in the response to a social need and must be inserted in a sufficiently advanced stage of culture and techniques inherited to allow the emergence of a certain idea (Simonton, 2019).

Good ideas are inevitably limited by the parts and skills that surround it. Ideas are DIY work; they are made from the debris of old ideas and plastered tradition. We take the ideas we inherit or encounter and set them in a new way (Johnson, 2010, p. 28)

Creative environments are like *webs*, whether these webs are ideas or people; however, the network is not intelligent in itself, but the individuals who feed it become smarter because they are connected to it (Sawyer, 2006). Networks tend to flow from mind to mind, what Johnson (2010) called *Information Overflow*; this overflow between minds allows useful innovations to be more likely to appear and spread among the population, as Johnson (2010) puts it:

A metropolis shares a key feature with the web: both environments are liquid, dense networks where information flows easily along multiple, unpredictable paths. These interconnections nourish great ideas because great ideas, in general, come to the world barely finished, more like intuitions than revelations. (...) Therefore, most of the great ideas are configured first in a partial, incomplete way. (...) Liquid networks create an environment in which these partial ideas can connect; (...) They facilitate the spread of good ideas, of course, but they also do something more sublime: they help to complete ideas. Johnson (2010, p.65)

This happens because of *recombination*: old products and services can eventually be divided and

recombined in different ways (Kauffman, 2016). The more diverse the *web*, the easier it is to find new combinations.

The great inventions were not the work of a single mind, but a set of small and prior inventions which, together, form progress (Rhodes, 1961). It is common to attribute the success of great inventions only to those who have discovered them, covering up the role of the environment in the creation and diffusion of the ideas that led to those inventions; therefore, it is equally useful to examine the intuitions that preceded and failed them (Simonton, 2000).

Creativity is never an individual act, but a systemic act of interaction between the creative person and his / her socio-cultural environment, which will recognize it as a genuinely creative act or not (Guilera, 2011; Runco, 2019). In this way, even if the individual presents himself as creative and contributes actively and creatively to the environment in which he lives, it is possible that this environment represses and condemns his creativity, leading him to believe that he is not or not to be creative.

Thus we can interpret creativity as both an individual and a social phenomenon. At the same time, it manifests itself as an idea, action or product developed by one or more individuals, but which needs to be recognized by society or group.

Conclusion

It is impossible to consider the existence of creativity without the influence of the environment because creativity interacts directly with how we see and experience the world. In the perspective of the 4 Ps of creativity, we can see the individual as part of the dimension of the person, in the sense of being who creates, but also, as a product of the environment which, in turn, can be understood as the dimension of the process, responsible for build ideas and open to new possibilities in your own Possible Adjacent.

Once it is needed to learn how to be creative, comprehend the creativity and the creative process clarify what makes the individual creative or not, and what we need to do to foster creativity in today's educational environment, and how it's possible to fully develop this potential of the students.

The idea of establishing the 4 Ps of creativity as a main guiding line has allowed exploring paths that, although apparently distinct, interconnect. It is possible to see that perhaps it is needed to focus not only on creativity as something outside the context but also on the importance of this context in the development and stimulation of the creative potential of the individual.

Moreover, we conclude this work with the expectation that it is clear the importance of exploring this theme, that all the knowledge present here can be added to the study of creativity and encourage future research on this topic, exploring more carefully and curiously its various manifestations and to find strategies that enable us to use creativity and stimulate it in the most varied contexts.

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