Creativity and innovation: Skills for the 21st Century

Criatividade e inovação: competências para o século XXI

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Abstract

Creativity and innovation have been highlighted as essential skills for the 21st century, especially if we consider that both skills can promote human potential by eliciting positive aspects of the individual. These skills have been valued in different contexts. The purpose of this text is to discuss the notions of creativity and innovation as independent constructs and to discuss the relationships between these concepts according to the scientific literature. Three different propositions will be presented, namely, treating these constructs as synonyms, as distinct from each other or as complimentary.

Keywords: Creativity; Innovation; Positive psychology.

Resumo

Tanto a criatividade quanto a inovação vêm sendo ressaltadas como habilidades essenciais para o século XXI, notadamente diante da constatação de que, ambas, atuam no sentido de favorecer o potencial humano, constituindo-se em aspectos positivos do indivíduo, valorizados, cada vez mais, em diferentes contextos. Nesse sentido, o presente texto enfocará as compreensões sobre criatividade e inovação, como construtos isolados e depois as relações que se estabelecem entre esses conceitos, de acordo com a literatura científica. Três diferentes propostas serão apresentadas, tratando os construtos como sinônimos, como elementos distintos e ainda como complementares.

Palavras-chave: *Criatividade; Inovação; Psicologia positiva.*

The development of humanity has been increasingly dependent on innovation and discovery.

From this point of view, creativity is perceived not only as the expression of human potential

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but also understood as fundamental for societal growth. Considering that innovation depends on the occurrence of creativity, applied to a specific domain, there is the need to understand these phenomena, and to determine if they are independent, related or complementary.

Understanding creativity

Interest in the study of creativity can be explained by the need to further understand human potential and traits relative to the positive aspects of the individual (Kaufman & Beghetto, 2009; Sternberg, Grigorenko, & Singer, 2004). This characteristic has been valued because of its importance in promoting individual well-being, in both personal and professional achievements (Wechsler & Nakano, 2018), and in the important contributions that it can bring to humanity (Krentzman, 2013; Pfeiffer & Wechsler, 2013). These reasons make creativity an increasingly appreciated characteristic perceived as a valuable resource for individual and social development.

Creativity can be understood as being a multidimensional construct, involving cognitive variables, personality characteristics, family, educational aspects, and both social and cultural elements. These dimensions interact with each other according to individual thinking and creative styles and are therefore expressed and found in many different ways (Sternberg, 2010; Wechsler, 2008). Therefore, the creative phenomenon has been studied under the most different approaches, sometimes emphasizing the person, or the process or products, the environment, or even the interaction between two or more of these variables, thus implying that creativity has multiple ways to be identified (Alencar & Fleith, 2008; Nakano & Wechsler, 2012).

The study of the creative person includes research into both the cognitive value as well as personality variables. Cognitive aspects involved in creative thinking are mainly related to divergent thinking skills, emphasized in Guilford's (1966) work, which names them as fluency, flexibility, elaboration and originality and were later confirmed by Torrance's numerous works that look at the predictive value of these characteristics on adults' creative achievements (Torrance, 1972, 1993). Personality variables associated with creativity are an amalgam of positive characteristics, such as curiosity, tolerance towards different ideas, autonomy, imagination, self-confidence, persistence, motivation, and others (Almeida & Wechsler, 2015; Plucker & Renzulli, 1999). Nevertheless, rather than believing that creative people possess all of these characteristics, there is a consensus among authors indicating there are many different paths along which people can display their creative potential (Isaksen, Dorval, & Treffinger, 2011).

The creative person, according to a humanistic perspective, has the consciousness and the abilities to address crisis in transformative ways (O'Hara, 2017). Therefore, the creative person can be understood as being in a process to reach self-actualization and to develop characteristics that are related to mental health, such as subjective well-being, resilience, optimism, quality of life, and other aspects emphasized by positive psychology (Wechsler, Oliveira, & Suarez, 2015). According to Amabile's (1996) conception, creativity would involve the interface of motivation with a specific area of knowledge. Thus, creative people would function on behalf of their intrinsic motivation, considering this as a key component to influence an individual's ability to express his/her talents (Subotnick, Olszewski-Kubilius, & Worrell, 2011). The state of *Flow* describes these moments of intense concentration and high involvement in which creative people forget schedules or environments when they are pursuing a highly motivating task (Csikszentmihalyi, 1997; McCoach & Flake, 2018).

To understand the creative process, it is important to review Wallachs' definition of the phases involved in this process: preparation, incubation, illumination and verification (Treffinger & Isaksen, 2005). These processes were later clarified in the model known as Osborn-Parnes's Creative Problem Solving Model, which is composed of five stages: fact- finding, problem-clarification,

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idea finding, solution generation and acceptance finding (Isaksen, Treffinger, & Dorval, 2001). These phases indicate that problem solving comprises stages of generating ideas using creative thinking followed by cognitive processes, demanding the evaluation and implementation of ideas, which are more related to critical thinking (Grohman, Wodniecka, & Klusak, 2006). Therefore, both divergent and convergent thinking are presented in creative problem solving (Wechsler et al., 2018).

Creative products, on the other hand, can be concrete or tangible, or intangible such as learning or developing a new skill (Isaksen et al., 2011). The question of evaluating creative products is always a central issue of debates, as there are so many criteria to be considered. An interesting proposal was made by O'Quin and Besemer (2006) in order to solve this problem, and this considers three main dimensions: novelty, resolution and style. The novelty dimension examines the original contribution the product brings to an area; the resolution aspect refers to how well the product solves the problem from which it was derived; and finally, the style aspect is related to the elaboration or the outcome of making that product more attractive. Another criterion was added by Kaufman, Beghetto, and Pourjalali (2011), stating that a creative product requires not only that the solution be unique but also relevant to the task. In this sense, creativity differs from a thought that may be extremely original but is irrational and that is totally unrelated to the task.

Concerns are also raised by David, Nakano, Morais, and Primi (2011) about the environment that impacts creative productivity, by either stimulating or inhibiting creative expression. The importance of education is confirmed in various studies (Pfeiffer, 2018), indicating that teachers as well as parents play a definite role in incentivating talents from childhood to adolescence. On the other hand, the cultural context has to also be considered as a creative product requiring not only originality and task relevance but also cultural values (Beghetto & Kaufman, 2014). Thus, the System Model of Creativity, proposed by Csikszentmihalyi (1996) in order to understand creativity, considers the interaction of three subsystems: the individual,

the domain or area of expertise, and the field represented by the gatekeepers or judges who will allow the product to be recognized. This area of study sometimes is confused as innovation, since the focus is on product rather than the person or the process. However, there are differences to be considered, and these will be defined in the next sections.

Understanding innovation

Innovation has been valued as a necessary individual characteristic in the globalized world. Taken as a concept of multidisciplinary interest, research on this phenomenon has been developed in several areas of knowledge including administration, education, economics, psychology and sociology, among others. As a concept, innovation has been defined as the development of the product or practice of new and useful ideas to benefit individuals, teams, organizations or a broader range of society (Bledow, Frese, Anderson, Erez, & Farr 2009). Then, there is the need to clarify that innovation is not just a matter of coming up with a new idea but also requires a valuable product. In this case, "product" is not limited to a tangible object but can also be a seen as a process to increase production and reduce costs in a way not yet tested in that specific context (Cropley, Kaufman, & Cropley, 2011).

The term "Innovation" is always linked to the insertion, implementation or development of an idea, product or service for the purpose of utility in society. Given its amplitude, different types of innovation were defined by the Organization for Economic Cooperation and Development (OECD, 2016) as the following: a) product innovation is the application of an idea or service that has undergone substantial development, the feasibility of which may be related to its functionality or other techniques that make new uses for that idea or service possible; b) process innovation, referring to the development of new methods to achieve a given production; c) organizational innovation, or new types of organization or means of administering organizations; and d) marketing innovation,

whereby new methods are used to obtain the development of products and their associated packaging, forms of cost and promotional publicity.

The distinction between product or process innovation is based on the social impact of each of these terms. While product innovation has a clear effect on the economy and job creation, process innovation must be looked at relative to its ability to bring a cost reduction, the time required for a given activity to be completed, or a significant gain in effectiveness to provide some type of service (Mello, 2009). Understood in this way, innovation would involve the transformation or application of a concept into something that might have commercial value or that could be used by a wide range of people (Verissimo, 2009). Therefore, innovation tends to be seen more as something related to the financial or social impact and may or may not be related to a technological discovery (Cabral, 2003). Increasingly, there is a tendency among countries concerned with innovation to approach this issue under a systematic approach to tackle complex problems, rather than trying to solve a specific problem or case, as this change involves many variables.

Due to its relevance, innovation has been focused on as a point of research by important Brazilian centers of studies, such as the Innovation Agency at University of Campinas (2018), the Innovation Research Center at Federal University of Rio Grande do Sul (2018), the Center for Technology Policy and Management at University of São Paulo (2018), and the Brazilian Association of Creativity and Innovation (*Associação Brasileira de Criatividade e Inovação*, 2018),. In other countries as well, such as those located in Asia (India, China, Mongolia, Thailand, Philippines, Korea, Thailand, Australia), and as reviewed in the United Nations Educational, Scientific and Cultural Organization (Care & Luo, 2016) report, there are two main domains, mentioned by all of them, on which their policies will focus in the 21st century: creative and innovative thinking (involving creative thinking, critical thinking, reflective thinking, and decision making) and interpersonal skills (communication and collaboration). Due to the recognition of creativity and innovation as key competencies for development, there is the need to characterize their relationship.

The relationship between creativity and innovation

Given the globalization of business, which has increased the international mobility of managers and the tendency to expand innovative activity across countries, it has become increasingly important to understand the relationship between the processes of creativity and innovation (Candeias, 2008). Innovation is valued not only for individual and organizational performance but also for economic success and social development at the global level (Westwood & Low, 2003).

Differences between national and international interest in the subject can be noted in relation to the number of studies carried out. A simple search on Google Scholar in December 2017 showed that by looking for the combination of the terms in Brazilian Portuguese "*criatividade* and *inovação*", about only 8,570 results were found. When the terms were searched in English ("creativity and innovation"), 103,000 results were found. This number represents less than 8% of the number of studies found internationally. The data demonstrate that, as highlighted by Stein and Harper (2012), there is currently a vast literature on the two constructs in general and with reference to many specific fields, including management, economy and community development, most notably on the international scale. Nevertheless, there is a small number of studies focusing on the relationship between constructs.

In the investigation of these two phenomena, several issues are present. For instance, is innovation different from creativity? Is the presence of creativity necessary to reach innovation, or can these processes operate independently? Such questions have been topics of interest to several researchers, indicating the importance of understanding these concepts and their possible interactions.

While the study of creativity goes back to the beginnings of psychology science, the application

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of psychological theories in understanding and explaining the relationship between creativity and innovation is more recent (Reiter-Palmon, 2011). The two characteristics were, until recently, investigated primarily separately (Agars, Kaufman, & Locke, 2008). For this reason, the gap resulting from this independence of research among the two concepts is only beginning to be investigated. There is a threshold of creativity that is necessary for innovation, according to Runco (2011), as creative efforts may benefit from extreme originality, whereas innovation requires some originality, not maximum novelty, as the most important factor in effectiveness or public usefulness.

This fact can be confirmed by Joo, McLean, and Yang (2013), after an extensive review of empirical studies published between 2001 and 2012, who pointed to the fact that studies on creativity directed toward understanding the development of human resources have been scarce, notably those that jointly address creativity and innovation. Nationally, a review of research on creativity in the organizational context carried out by Spadari and Nakano (2015) showed that among 40 analyzed Brazilian studies published between 1989 and 2014, the creativity construct was directly investigated as related to the concept of innovation in only 22.5% of the studies. According to these authors, specifically in the field of psychology, great focus has been given to the investigation of the relationship of creativity with innovation, as well to the application of innovation mainly in the organizational context. Similarly, a review of scientific production on creativity and innovation (Campos, Nakano, Ribeiro, & Silva, 2014), after having consulted 285 studies from different Brazilian databases, showed that the complexity of the two phenomena became visible in light of the number of studies focused on the two constructs, in either isolation or combination, and applied to several areas of knowledge (predominantly in psychology, administration and education).

These findings confirm the multidisciplinary approach of both constructs (Amorim & Frederico, 2008; Giglio, Wechsler, & Bragotto, 2009; Valentim, 2008), as well as the fact that most studies involving the relationship between creativity and innovation are still much more exploratory than effectively subsidized by theoretical models. Thus, three different approaches can be found: innovation and creativity taken as synonyms, as distinct characteristics, or as complementary. Each approach will be further explored below.

Creativity and innovation as synonymous

This view argues that both constructs can be considered synonymous, considering the final product is the same (De Breu, Njistad, Bechtoldt, & Baas, 2011). However, the literature has challenged this view, stating that creativity alone does not necessarily generate innovation and may assume, in part, responsibility for its promotion or being one of the sources of innovation (Ribeiro & Moraes, 2014).

Criticisms of this understanding involve the fact that if we consider these constructs as synonyms, we fail to recognize several important points that distinguish them (De Breu et al., 2011). First, creativity requires something appropriate, an idea, insight or solution that solves a problem, while innovations require that this idea be implemented, in the sense of making some progress. In contrast to creativity, innovation would require overcoming a number of barriers or steps to be implemented, including problem analysis, evaluation and implementation (Zeng, Proctor, & Salvendy, 2011).

Authors such as Somech and Drach-Zahavy (2013), in a study that revised the literature on innovation, found that most studies refer to innovation as a generic concept and therefore do not differentiate between the two stages of innovation: the creativity stage of the generation of new ideas, and the implementation phase, which is the successful implementation of creative ideas. In this model, creativity often refers to the first phase of the innovation process and can be seen as a subprocess of innovation. This emphasis will be used and best explained in the following view. However, researchers have recently adopted an interactional approach, arguing that situational and personal factors can have a combined effect on innovation.

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Creativity and innovation as distinct constructs

At the other extreme, such constructs have also been studied as distinct and unrelated concepts (Cerne, Jaklic, & Skerlavaj, 2013; Reiter-Palmon, 2011; Stein & Harper, 2012; Zeng et al., 2011). In this view, researchers note the use of the terms indistinctly, given that both can be considered from a perspective related to the final product, evaluated in terms of its novelty and adequacy (in the case of creativity) or its usefulness (in the case of innovations) (De Breu et al., 2011).

The difference between the constructs is mainly related to the recognition that creativity has been identified as the most important determinant of innovation, constituting one of its sources (Amabile, 1988). The difference between creativity and innovation would lie in the fact that innovation particularly concerns the outcome of a process, whether it is a new product or even a new service; that is, putting an idea into practice within a context (Amorim & Frederico, 2008). Creativity, however, would be more directly related to the creation of new ideas without the need for their practical application (Gurteen, 1998; Mundim & Wechsler, 2007). Similarly, according to the authors, both creativity and innovation require a complete rupture of conventional thinking, similar to a radical paradigm shift, beginning with a divergence of viewpoints and attempting to achieve convergence (agreement), so that there are processes of divergence and convergence, of integrating the new with the old.

Another distinction to be made is that creativity requires something new and original, in terms of absolute rarity. Innovation requires that this novelty be for the current group or situation, so that it does not have to be original in the sense that it has never been thought of before and may be relative. It admits the possibility that the same idea, insight, or solution and even its implementation has already been generated, having only to guarantee that its adoption, in that situation, unit or department, is considered an innovation for those people involved (Hammond, Neff, Farr, Schwall, & Zhao, 2011). An important question is posited by Glaveanu (2010): Novelty? for whom? useful for whom? This question emphasizes the point that a process or product can only be evaluated as more or less creative in relation to something (a group, a domain or a historical period).

However, the distinction between creativity and innovation may involve two types of risk, emphasized by Isaksen et al. (2001). The first is to place too much emphasis on the product to be obtained, leading to the misunderstanding that other factors important for innovation are not needed, such as the person, the process and the environment. Indeed, most organizations that failed to achieve innovation forgot about the importance of the human element as well as the processes or operations needed to achieve innovation or environmental context for this to happen. The second risk is to limit creativity to a mythological view, understanding it only as the generation of different ideas, without any concern with its adequacy and solution of real problems, erroneously indicating that creativity only involves the production of new ideas (Runco, 2009). However, it must be remembered that creativity involves the realization of something different and meaningful, and thus innovation must be seen as a subset or a result of creativity. Therefore, innovation needs creativity in order to happen, and it is not possible to generate something new and useful for society without an earlier creative process (Dionne, 2008).

Another distinction between creativity and innovation was proposed by Clydesdale (2006), who suggested that creativity is driven by intrinsic motivation, whereas innovation results from extrinsic motives, or the need to overcome standards of thinking or practicing. Another distinction refers to the fact that creativity must be investigated at the individual level, whereas innovation must be analyzed in terms of a team or organizational level (Cerne et al., 2013). Thus, many steps occur between having an idea and putting it into practice, running the risk that there may be a failure of communication between these two moments (Wechsler & Nakano, 2018).

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Creativity and innovation as a complementary construct

Finally, the view that defends the idea that creativity and innovation are related concepts seems the most consensual. In this model, innovation involves two stages: the creativity phase (generation of new ideas) and the implementation phase (the succession of creative ideas). In this sense, creativity would be defined as the first stage of a problem-solving process, while innovation is focused on the implementation of the idea and its acceptance. However, both would require a rupture of conventional thinking and involve divergence and convergence.

Creativity has been described as the most important determinant of innovation, as explained by Amabile (1988). In this sense, creativity is important in itself and can be conceptualized as a necessary precondition for innovation (Joo et al., 2013), although this would depend not only on creativity but also on external sources such as the market and its regulatory forces, so that the connection between the two concepts cannot be considered simple and linear (King, 1995).

Final Considerations

In the challenge of considering the relationship between the two important themes, it should be noted that both creativity and innovation have historically been complex phenomena, subject to innumerable contextual and social influences. These variables deserve multiple views so that they can be known and understood in the different fields of knowledge (Giglio et al., 2009).

The search for creative professionals who can innovate – that is, individuals who stand out for their mastery of efficient strategies to address new problems and solve them successfully – has been emphasized by different types of organizations (Cropley, 2005). These data indicate the need for a creative education, ranging from elementary to higher education, motivating students to genuinely desire to learn, to discover new subjects and to go beyond the teaching offered in the classroom. This change in attitude towards education involves a rethinking of teaching strategies and a challenge to old teaching styles in order to encourage students and future professionals to develop the creative and innovative skills that are so required and valued as essential skills in the 21st century.

The literature review points to several historical and conceptual issues that are being faced by researchers interested in the relationship between creativity and innovation. Some of them may be mentioned: (1) although these characteristics are becoming more and more desired, especially in the organizational context due to the benefits that can be generated for the companies, difficulties in their identification are still present; (2) important observation also refers to the fact that most of the studies involving the theme still turn to initial explorations on the relation of creativity with innovation; (3) the need for other focuses to be investigated; for example, creative and innovative expression on a personal level in various contexts, such as social and educational, as well as the relationship with other constructs that make up positive psychology, such as hope, self-efficacy, self-esteem, optimism, resilience and affection. These limitations still constitute gaps in the Brazilian scientific literature, and research with these focuses should be conducted. It is necessary to mention, finally, the limitation relating to the existing psychological instruments to identify these abilities; thus, it is recommended that more research examine the areas of creativity and innovation assessment in order to enable a scientific basis for recognizing these phenomena.

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