

Creativity Among Adolescents and Emerging Adults in the Post-pandemic Era: A Review of the Role of the School and University System

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ABSTRACT

This literature review, focusing on creativity in the time of the pandemic and post-pandemic, aims to explore the role of creativity in young people's well-being through the education and university system. The article starts from a redefinition of creativity in the light of a dynamic and interactionist view between person, environment and task as proposed by contemporary studies. A major focus is on the role that creativity has played in well-being in the pandemic and post-pandemic period, especially for vulnerable populations such as adolescents and emerging adults. The article also focuses on the developmental tasks of adolescence and emerging adulthood, which make them particularly appropriate times for developing and promoting creativity. Finally, the review analyzes the contribution and support that schools offer young people during the pandemic. What resources and obstacles still stand in the way of the education system fostering creativity in adolescents and young adults today? The review aims to draw attention to the debated topic of creativity in education systems. Schools and universities can continue to support young people

in the post-pandemic era by helping them to play an active role in society using their creative potential.

KEYWORDS:

creativity, students, adolescents, emerging adults, school system, university system

Article history:

Received: March 3, 2024

Received in revised form: May 14, 2024

Accepted: June 21, 2024

ISSN 2354-0036

DOI: 10.2478/ctra-2024-0009

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INTRODUCTION: DEFINITION UPDATE AND HISTORICAL NOTES

More than four decades ago, Torrance (1988) stated that “Creativity defies precise definition” (p. 43). Over the years, more than 100 definitions have been documented (e.g., Aleinikov et al., 2000; Runco & Jaeger, 2012). Thus, although human creativity is one of the most important and fascinating aspects of psychological functioning, scholars are still in search of a clear and unambiguous definition. One quickly realizes that the problem of explaining how people can succeed in this endeavor reflects the difficulty of tracking down a clear definition of this ability (Kaufman et al., 2010). Despite these difficulties, the first step towards understanding creativity might be to define it. With this purpose, Kampylis & Valtanen’s (2010) study analyzed 42 definitions of creativity, from 1950 to 2010, to capture common elements. The authors noted that most of these definitions shared four basic components:

1. Creativity is a key ability/competency of individuals.
2. Creativity presupposes an intentional activity/process.
3. The creative process occurs in a specific context or environment.
4. The creative process involves the generation of products, which are tangible or intangible. Creative products must be new, original, unconventional, appropriate, valuable, and useful to oneself or others.

On this basis, a creative response is new, good, and relevant (Kaufman et al., 2010).

In recent years, Walia (2019) has derived the following characteristic elements of creativity in the new millennium from the four components that characterize the definition of creativity:

- creativity is a human act that produces something new, which can be a physical object or even a mental or emotional construct, as already suggested by Vygotsky (2004);
- creativity, as Kampylis & Valtanen (2010) noted, requires an intentional process of production rather than reproduction. Both are necessary to create, but productive activity occurs when new experiences interact with existing knowledge and experiences to create new images and ideas (Vygotsky, 2004);
- creativity requires disequilibrium. When everything around the individual is in equilibrium and the individual chooses to adapt to the context, conditions do not lead to creative activity (Vygotsky, 2004; Jackson, 2013). The process of creation involves a constant oscillation between equilibrium and disequilibrium. The recognition or perception of a certain disequilibrium would trigger the need to be creative (Vygotsky, 2004; Shkliarevsky, 2017);
- creativity requires sensitivity in perceiving a problem in a particular context. Sensitivity thus seems to create or detect an imbalance in the environment that triggers cognitive abilities to find productive actions (Kaufman et al., 2010);

These considerations now lead us to a dynamic view of creativity, which results from the interaction between the person, the environment, and the task. The focus can thus be on one of the three components and, regardless of which is the central element or starting point of the analysis, the other two elements act as moderators that need to be considered for a complete understanding of creativity (Tromp & Sternberg, 2022). Walia (2019) defines it as follows:

Creativity is an act arising out of a perception of the environment that acknowledges a certain disequilibrium, resulting in productive activity that challenges patterned thought processes and norms, and gives rise to something new in the form of a physical object or even a mental or an emotional construct" (p. 7)

Though creativity has accompanied human history since the earliest times, various literature reviews note that it is only since the twentieth century that the topic of creativity has been the subject of in-depth research conducted according to specific investigative criteria of the scientific method (Stein, 1963; Simonton, 2001; Fisher & Williams, 2012). In the post-war period, the topic of creativity assumed special significance, especially in psychology. This is because the idea began to take hold that in order to develop an open and non-conformist society, it was necessary to respond to individual needs and freedoms, the ability to go against socially prescribed patterns, and thus move away from conformity (Stein, 1963; Simonton, 2001). Stein (1963) echoes the spirit of optimism of the second post-war period, "The challenge of our time does not lie in concerns with conformity, but in the challenge to create the free society that will provide these freedoms" (p. 130). Similarly, Barron (1963) wrote in those years that the creative society of the future should have "freedom of expression and movement, no fear of dissent and contradiction, a willingness to break habits, a spirit of play and devotion to work" (p. 152).

The social and political changes of the 1950s and 1960s and the more open socio-cultural climate made it clear that creative abilities were not an exceptional gift bestowed on a few, but inherent in everyone in different forms and qualities (Silvia et al., 2014). This made it possible to foster creativity in everyday contexts, among people of all social classes, genders, and ages, overcoming the notion that had long described creativity as a skill reserved for a few genius individuals (Sawyer, 2017).

In the last decades of the 19th century, people realized that sustainable development required a focus on creativity, which is recognized as promoting social change and economic growth (Zeng et al., 2011). In parallel, in 1993 the World Health Organization (1993) included creativity in the list of life skills for the development and positive adaptation of individuals to their environment and subjective well-being. In this way, the WHO affirms the fundamental role of creativity in the development and well-being of the individual and society, and thus also sets the lines of development for the new millennium (World Health Organization, 1993). In 2006, the European Parliament and Council included creativity as one of the eight key competencies of lifelong learning and consequently developed a comprehensive plan for education and training that uses creativity in the personal, interpersonal, and intercultural fields (European Commission, 2006). Since the beginning of the

2020s, creativity has become even more important. The spread of Covid-19 and the consequences of the pandemic have triggered a new wave of interest in the use of creativity for well-being.

This section uses a dynamic view of creativity to discuss its role in the course of the most important historical events of the last century. It is no coincidence that interest in creativity always revives when people are confronted with major global crises, as in the case of the world wars and the major socio-political changes of the 1950s and 1960s. Indeed, times of major international crises lead to a sharp increase in creative abilities that support people in their search for new adaptive solutions. The pandemic also took the form of a global crisis, both on a health and socio-economic level. For this reason, interest in creativity, creative responses, and the promotion of creativity has risen sharply again since 2020. Given this important moment in creative development, and considering the populations that have proven to be particularly vulnerable in the post-pandemic period, there has been much discussion in the literature about the relationship between creativity and youth. However, as the development of personal skills in adolescents and a proportion of young adults is related to the school experience, this review focuses on creativity in an educational context. Therefore, the research question guiding this review is: Do schools and universities foster creative competence in adolescents and young adults?

CREATIVITY AND WELL-BEING DURING THE PANDEMIC: ADOLESCENTS AND EMERGING ADULTS

Studies show that creativity is one factor that maintained well-being from the beginning of the pandemic to the present (Kapoor & Kaufman, 2020; Marciano, 2021; Mercier et al., 2021; Brosowsky et al., 2022; De Lorenzo et al., 2024). Daily engagement in creative activities and overcoming boredom as a normative experience have certainly contributed to the enhancement of well-being (Brosowsky et al., 2022). In this sense, creative activity enabled people to understand and cope with the uncertainty resulting from the pandemic by challenging old assumptions and experimenting with new possibilities. Uncertainty thus provided an opportunity for creativity to emerge (Mercier et al., 2021). Creativity is therefore an important predictor of well-being, especially psychological and physical and relational well-being (Brosowsky et al., 2022; Zhao et al., 2022). Orkibi's (2021) studies have highlighted the protective role of creativity in the daily pandemic, specifically talking about creative adaptation, i.e. the ability to respond creatively and adaptively to stressful situations (Orkibi, 2021).

Adolescents and emerging adults were the populations most affected by the consequences of Covid-19 in terms of physical and mental health (Meherali et al., 2021). The condition of adolescents and emerging adults, which are vulnerable populations, was already known before the pandemic (Binagwaho & Senga, 2021). In 2015, the mental health of children, adolescents, and young adults was recognized as one of the priorities of the Sustainable Development Goals (Radez et al., 2021). In fact, about 15% were already suffering from mental health problems such as depression, anxiety,

and behavioral disorders before the pandemic (Binagwaho & Senga, 2021; Magson et al., 2021). All mental disorders left untreated before the onset of the pandemic developed or became chronic as a result of stress, isolation, and altered living conditions during Covid-19 (Binagwaho & Senga, 2021; Magson et al., 2021). This widespread distress increased morbidity with other diseases and risk behaviors such as drug use, self-harm, and suicide—the third leading cause of death among adolescents aged 15-19 years (Binagwaho & Senga, 2021; Smith et al., 2020). To-date, several literature reviews report on the psychological distress and difficulties faced by youth, many of which remain unresolved (Panchal et al., 2021; Samji et al., 2022; Kauhanen et al., 2022). Resources, a starting point for providing young people with specific services, listening, and support provided in order to resume activities after the pandemic also emerge from these studies (Panchal et al., 2021; Samji et al., 2022; Kauhanen et al., 2022). Creativity also plays an important role as a resource for adolescents and young adults. Indeed, creative behaviors promote resilience (Metzl & Morrell, 2008), reduce stress, improve sense-making, and support psychological well-being (Kapoor & Kaufman, 2020; Magson et al., 2021; Patston et al., 2021).

ADOLESCENTS AND CREATIVITY

During adolescence, the physical, cognitive, and affective developments that characterize this age lead to a search for a clearer and more concrete sense of self and identity (Beyers & Çok, 2008; Anderson, 2020). During this period, rapid maturation takes place at socio-emotional, cognitive, and neurobiological levels (Barbot & Heuser, 2017). Adolescence (i.e., the age from about 14 to 19 years) is often regarded by developmental theorists as a complex period with different levels and areas of criticality (Magson et al., 2021; Casey et al., 2010). This time of life is characterized by a major shift in identity development, intrinsically linked to the development of one's creative potential (Anderson, 2020). Identity formation itself, in fact, can be seen as a creative process through which adolescents can explore the many opportunities that the external and internal environment offers them. The process of identity formation thus understood involves exploratory processes, typical of divergent thinking, and integrates multiple elements, such as representations of the world, commitments, choices, and opinions, in order to formulate a personal, integrated, new product (Anderson, 2020; Barbot & Heuser, 2017). Indeed, although divergent thinking begins to develop very early in children, adolescence represents a new turning point in the development of this component of creative potential. This trend coincides with a relative increase in certain factors, such as curiosity, complexity, or risk-taking, which seem to logically align with the context of adolescent identity formation (Anderson, 2020; Barbot & Heuser, 2017).

Creativity in adolescence is also related to self-expression, or the expression of thoughts, ideas, feelings, and emotions that can serve to externalize stress in conflict or stressful situations (Anderson, 2020). Creativity can therefore be seen as a resilience mechanism to overcome the anxiety and stress associated with the normative but often stressful tasks of adolescent development (Barbot

& Heuser, 2017). Adolescents can use creative activities as opportunities for adaptive self-expression (Anderson, 2020). In particular, creative-divergent thinking can enhance the process of identity exploration and formation by expanding what is perceived as possible and realizing these possibilities in the adolescent's reality (Sica et al., 2019).

One of the most important roles of the adolescent is that of the learner. Therefore, the development of creative potential in adolescence is closely linked to the school experience. It is precisely the school context, together with reference adults and peers, that seeks to foster creative thinking in everyday activities, both curricular and extracurricular (Zaeske et al., 2022). This situation intensified during the pandemic, when the school system needed flexibility and innovation to continue teaching. Thus, the school context, almost unintentionally, became the main facilitator of creative experiences and divergent thinking for adolescents from different parts of the world (Zaeske et al., 2022; Sica, 2022).

EMERGING ADULTS AND CREATIVITY

The development of creative potential, stimulated by the major changes in the adolescent period, persists into the first stage of adulthood, known as emerging adulthood (Anderson, 2020). This stage of development includes individuals from the ages of 19–20 years to around age 35: emerging adulthood could be defined as the period beginning with the end of high school and ending with moving out of the parental home (Arnett, 2007). The emerging adult devotes their energies to developing their own adult identity, which is also essential for building intimate and deep interpersonal bonds and finding autonomy by detaching from the family of origin (Sica, 2022; Arnett, 2007; Sussman & Arnett, 2014). This process of identity formation becomes even more important in today's modern, fluid society, which implies a more flexible organization of life (Bauman, 2013). For these reasons, identity formation can be understood as a lengthy, open-ended process, often outside norms and standards and characterized by heterogeneous and diverse pathways (Kraus, 2007).

Furthermore, young people in this age group become more aware of their creative abilities and begin to perceive creativity as an essential aspect of the self (Karwowski et al., 2021; Sica & Sestito, 2021). As with adolescents, then, the relationship between creativity and well-being holds true, especially in terms of the ability to externalize psychological stress and discomfort through self-expression via creative activities (Anderson, 2020; Sica et al., 2019). At the same time, creativity can be understood as a resilience mechanism for coping with stressful events related to turning points (i.e., a particular episode or series of episodes that can change or redirect the course of one's life; see e.g., Barbot & Heuser, 2017; Sica & Sestito, 2021). In addition, the creativity of this particular age group found various forms of expression and manifestations in schools and education during the pandemic (De Lorenzo et al., 2023; Sica, 2022).

POST-PANDEMIC CREATIVITY: RESTARTING FROM SCHOOL

While creativity is an already familiar term in education, wellness is a relatively new addition that implies a number of health concerns for young people (Humes, 2011). Valuing well-being in an educational context means recognizing the importance of the affective dimension of learning. After all, we do not learn only cognitively (Humes, 2011; Saulle et al., 2022). Such considerations of well-being in education became a focus of government policy and interest following the outbreak of the pandemic.

Since the early days of the spread of Covid-19, experts have been concerned about the impact that the suspension of face-to-face and introduction of distance education would have on students at all school levels (Grek & Landri, 2021). School closures not only risk significant learning losses but also significantly widen pre-existing socio-economic educational gaps (Saulle et al., 2022; Grek & Landri, 2021; Blaskó et al., 2022). In addition, the unequal distribution of resources in families has made it difficult for students to benefit equally from distance learning. Moreover, the school community was not prepared for distance learning and digital use. Teachers and students had to learn very quickly how to use tools they were not familiar with and often encountered problems and difficulties in securing access to the necessary resources (Palareti, 2020; Siakalli et al., 2022). A number of post-pandemic studies have highlighted the critical issues facing the education system, such as the organization and delivery of distance learning, which has become a major source of stress for all stakeholders in the school system (Palareti, 2020; Cowden et al., 2020; Rabaglietti et al., 2021). In other studies, the new educational context created by the pandemic has focused on innovation and creativity (Siakalli et al., 2022). Flexible thinking, creative adaptability, problem solving, and divergent thinking were all components that supported the education system at a time when uncertainty and fear dominated the world stage (Grek & Landri, 2021). The push to teach creative rather than analytical thinking, to use new technologies creatively, and to promote creativity in schools at all levels is thus precisely a consequence of the post-pandemic recovery (Siakalli et al., 2022; Grigorenko, 2019). Indeed, times of crisis are particularly conducive to the development of creativity, as they enable limitations and obstacles to be overcome due to the historical context (Patston et al., 2021).

Throughout the pandemic, unconventional educational methods have enabled the implementation of innovation and creativity in both teachers and students (Grek & Landri, 2021). The pandemic has stimulated creativity in all areas and has probably laid the foundation for new developments, even though it has been talked about for several years that there is no common basis for systematizing creativity in educational institutions at the international level. Perhaps creativity played a key role in exploring these new ways of learning in a different, digital, remote or hybrid educational context (Siakalli et al., 2022).

CREATIVITY IN THE EDUCATIONAL CONTEXT: OLD CHALLENGES AND NEW GOALS

Contemporary models of creativity (such as the four Cs model of creativity) aim to discredit the innate myth of creative genius and make using creative processes an everyday occurrence in all contexts of an individual's life (Kaufman & Beghetto, 2009). Furthermore, an important focus is placed on the creativity gradient: even a small act of creativity that is not shared and not necessarily accepted by others can make a difference to the individual experiencing it, at any age and in any context (Kaufman et al., 2016). However, some contexts, more than others, seem to be naturally predisposed to accommodating creative processes which need to be fostered, monitored, and enhanced (Kaufman et al., 2016). For example, taking into consideration the World Economic Forum's (2020) vision that creativity will be a crucial aspect of employability in the coming decades, several national and international educational institutions, such as the Organization for Economic Cooperation and Development (OECD), are developing programs to promote creativity in the classroom and in educational settings (Grigorenko, 2019; De Vries & Lubart, 2019). The educational context is thus established as one of the areas that contributes most to fostering creative potential, although not without difficulties. At the same time, creativity is recognized as the most important learning competency of the 21st century (Patston et al., 2021; Wang & Murota, 2016; Grey & Morris, 2022). It is considered to be one of the major transverse competencies (i.e., a comprehensive set of skills that are not specifically related to a particular job, task, discipline, or field of knowledge) and can be used in a variety of situations and contexts (Grey & Morris, 2022; OECD, 2019). UNICEF (2022) considers creativity to be one of the 12 core competencies that promotes academic achievement and helps discover students' diverse talents.

Creativity helps to cope with and constructively participate in new, complex, and ever-changing technological and digital contexts (Grigorenko, 2019). In addition, creativity strengthens adaptability in different life situations and leads to solutions, methods, and processes for dealing with old problems and contemporary challenges (Patston et al., 2021). Through the use of creativity, students develop a sense of self-efficacy and perseverance, leading to a sense of empowerment, while social creativity encourages students to be even more creative and to combine different ideas, sometimes even across cultures (Lucas & Venckute, 2020).

The European Council (2008) already identified education and training as crucial factors for a more competitive Europe two decades ago: knowledge and innovation are considered to be the beating heart of European growth. Member States and the Commission were therefore called upon to develop an innovative education sector that is also based on creative skills (Grigorenko, 2019; CEU, 2008). More recently, creativity, which is favored by the rise of Industry 4.0 and increased demands in the technology sector, has become one of the three key competencies in the OECD Education 2030 project (2018). As a result, creativity is no longer considered a marginal topic or luxury in the curriculum, but a key competency that should be promoted in all subject areas (Patston et al., 2021).

In general, there are two main premises that support the creative approach to education: creativity can be developed (Kaufman & Beghetto, 2009), and all individuals possess the potential to be creative (Silvia et al., 2014; Sawyer, 2017). Moreover, we now know that creativity and innovation in educational settings are not just an opportunity but a necessity (Patston et al., 2021; Ferrari et al., 2009). In particular, the priority is to encourage all students to reach their full potential (Kaufman & Beghetto, 2009; Newton & Newton, 2014). This is an inclusive and democratic perspective that assumes that all people are capable of creativity from an early age and that every student has creative potential that can be nurtured or inhibited depending on the type of stimuli they receive in the educational context (Ferrari et al., 2009; Newton & Newton, 2014).

THE OBSTACLES TO CREATIVITY AT SCHOOL

In view of the countless benefits of creativity in solving complex individual, social, and global problems (Patston et al., 2021; Newton & Newton, 2014), we would expect a major effort to promote creative potential in education (Beghetto, 2005). Although the scientific literature emphasizes the importance of fostering creativity in young people, especially in educational institutions, there are also numerous difficulties. The opportunity to foster creativity through educational experiences is constantly overshadowed by a multitude of other demands and issues that hinder its promotion and inclusion in the curriculum (Newton & Newton, 2014; Beghetto, 2005).

The main problem that interferes with the inclusion of creativity in education concerns a tacit knowledge about creativity that manifests itself among teachers, parents, students, and other educational stakeholders through the dissemination of false myths. Over time, this knowledge has given rise to a number of implicit theories which explain how ordinary people think about creativity, but which greatly differ from the scientifically supported theories known as explicit theories (Ferrari et al., 2009; Uszyńska-Jarmoc & Kunat, 2020).

Among the false myths that have hindered creativity's inclusion in school, for example, is that:

- it is still wrongly assumed that creativity is only used in the arts subjects, whereas today it is demonstrably a cross-curricular skill that can be used in any school subject;
- creativity was contrasted with knowledge in the past, whereas today we know that knowledge is indispensable to be able to implement creative thinking;
- creativity used to be considered a pure talent (i.e., an innate ability), but it has long been known that creativity can be learned and trained;
- creative learning has been associated with a time of pure fun, play, and random occurrences of creative processes. In reality, in a situation characterized by fun and play, there is also intense critical thinking and problem solving that often needs to be stimulated, especially in younger people, behind all creative learning (Ferrari et al., 2009; Uszyńska-

-Jarmoc & Kunat, 2020). Other obstacles to the promotion of creativity in the education system include problems with the timing of education and educational goals, which need to be achieved in a short time, almost always with scarce resources and without clarity on how to integrate creativity into the curriculum (Wang & Murota, 2016; Craft, 2005). All creative activities need more time to allow students to engage in their thinking processes without the pressure of a looming deadline (Davies et al., 2013). Slow time, then, is utopian to the rhythm of today's school system, which often resorts to extracurricular activities to achieve set goals (Wang & Murota, 2016).

Furthermore, there is a widespread perception that the education system suppresses rather than promotes creativity (Humes, 2011). This is because, in formal education, there is a tendency to look for a ready-made, packaged, and known answer even before the question can be asked, thus discouraging students from investigating and researching the answer(s) themselves (Wang & Murota, 2016; Ferrari et al., 2009). This thought process only concerns one type of intelligence and learning, ignoring the richness of individual diversity (Ferrari et al., 2009; Kaufman & Sternberg, 2010). But creativity, which implies originality and uniqueness, is fundamentally incompatible with the uniformity and standardization of school-factory products described by Grigorenko (Grigorenko, 2019).

These considerations involve the desirability paradox, according to which teachers tend to prefer standard answers over original ones because the current classroom culture does not value creative answers (Kaufman et al., 2016; Beghetto, 2005). The paradox is also reflected in teachers' preferences for certain types of ideal students. Indeed, teachers prefer compliant and caring students, traits that stand in stark contrast to creative personality attributes (Runco, 2004; Sprague & Parsons, 2012). The more creative a class becomes, the less desirable their behavior appears in the eyes of teachers, as creative behavior is often associated with skepticism, rebellion, and poor teaching (Humes, 2011; Ferrari et al., 2009; Newton & Newton, 2014). Teachers are at odds with students' views. Indeed, the literature has shown that creativity is one of the qualities most valued by students throughout their schooling (Uszyńska-Jarmoc & Kunat, 2020). Nevertheless, it should not be forgotten that while students are the main actors in education, their current power to actively contribute to institutional change is limited; indeed, they continue to be perceived as the ultimate recipients of methods and knowledge (Ferrari et al., 2009; Uszyńska-Jarmoc & Kunat, 2020).

The final but crucial aspect concerns assessment, which has been identified as one of the main contributors to the inhibition of creativity in schools (Lucas et al., 2013; Bolden et al., 2020). Specifically, there are three reasons why assessment is a barrier rather than a catalyst to creativity. The first reason relates to teaching organized by subject and the consequent difficulty of interdisciplinary work and cross-curricular assessment of creativity. The second relates to the historical link that exists between creativity and arts subjects and not science subjects, so that it is seen as impossible to implement and assess creativity. The third concerns the importance given to academic achieve-

ment and the assessment of progress, which is only associated with certain school subjects that are considered to be of high status, such as literature, mathematics, and science (Lucas et al., 2013).

Research has shown that in learning experiences that involve competition and comparison with others, the pressure of assessment can cause anxiety and undermine students' motivation and ability to be creative (Hennessey, 2010; Collard & Looney, 2014). Not surprisingly, teachers often resist assessing creativity because they fear it will discourage students from self-expression or because they simply believe creativity is too subjective to be assessed (Lucas et al., 2023; Bolden et al., 2020).

For more than a decade, attempts have been made to develop an approach to assessing creativity that is rigorous enough to ensure credibility and simple enough for teachers to use independently (Lucas et al., 2023; Collard & Looney, 2014). Assessing creativity in the school context would finally allow the importance of creativity to be emphasized in the curriculum and encourage the development of classroom activities that adequately support it. It would also enable an applied approach to creativity in learning processes, allowing teachers to track students' progress and provide them with more appropriate formative feedback to develop creative potential more effectively (Lucas et al., 2013).

CREATIVITY IN HIGHER EDUCATION

Meeting the needs of an increasingly complex and globalized society requires that education emphasize creative competency in the development of its students (McWilliam & Dawson, 2008; Hallman et al., 2016; Jahnke et al., 2017). Higher education in particular plays a crucial role in the development of creativity in young adults (Aktas, 2017). Although it has only become a topic of particular scholarly interest in the last decade, everyday creativity can also be easily promoted through higher education to encourage all students to reach and realize their full potential (McWilliam & Dawson, 2008; Papaleontiou-Louca et al., 2014). Creativity is a fundamental skill for young adults to cope with the ambiguous, complex, and rapidly changing world (Aktas, 2017; Ehtiyar & Baser, 2019). Indeed, higher education can be seen as the final step for emerging adults to develop their creative thinking skills by entering the world of work (Ehtiyar & Baser, 2019). Moreover, creativity has been identified as a driver of the new digital economy, which has increased the interest of universities in fostering creative thinking in view of a more technologically driven labor market (McWilliam & Dawson, 2008; Hallman et al., 2016; Jahnke et al., 2017; Aktas, 2017; Papaleontiou-Louca et al., 2014).

For these reasons, universities have, at least at the theoretical level, introduced strategic plans, policies, and curricula over the last decade, as well as established study centers to promote creativity (Hallman et al., 2016; Aktas, 2017; Ellis, 2022). Today's universities should evolve in parallel with Industry 4.0, which requires networked digital services and a new vision of teaching and learning with the application of innovative practices and approaches, and this seems to be the direction,

especially for the education system in some Eastern countries (McWilliam & Dawson, 2008; Ehtiyar & Baser, 2019; Wu & Wu, 2020). At the same time, students should be emerging adults with a strong sense of self-worth and a desire to be original, creative, and flexible in dealing with rapid changes in society (Aktas, 2017).

However, it seems that there is no room for originality and novelty in university teaching (Papaleontiou-Louca et al., 2014). Indeed, creative thinking is not sufficiently encouraged and taken into account in the academic world, especially in Europe, despite several initiatives by the European Union (Ehtiyar & Baser, 2019; OECD, 2019). Recent studies (Ehtiyar & Baser, 2019) argue that the university environment is not sufficiently stimulating to produce changes in students' creativity. A large proportion of them even claim that university education has negatively affected their creative potential. This is because the education system has focused on a convergent and conformist mindset that teaches university students, as well as younger students, the right answer rather than the creative answer (Papaleontiou-Louca et al., 2014; Susnea et al., 2014). Especially at the university level, teaching methods should focus on more than just teaching content and memorizing information (Papaleontiou-Louca et al., 2014; Ehtiyar & Baser, 2019). University students should be trained to inquire and investigate, solve problems, take risks, think critically, evaluate and act with great confidence. To stimulate them in this direction, teaching should include a variety of approaches and promote curiosity, self-regulation, and intrinsic motivation to foster creativity (McWilliam & Dawson, 2008; Ehtiyar & Baser, 2019).

One of the obstacles again concerns the definition of creativity (McWilliam & Dawson, 2008; Jahnke et al., 2017; Ellis, 2022). Moreover, despite their interest in creative thinking, students remain recipients and spectators, rarely agents and actors in the creative process (Papaleontiou-Louca et al., 2014), and their perceptions of creativity also differ depending on their field of study (Ehtiyar & Baser, 2019). Several studies claim that students associate creative potential with the tendency to innovate and entrepreneurial potential; they also state that creativity influences their intellectual abilities and they consider it an important aspect of their personal development and future career (Uszyńska-Jarmoc & Kunat, 2020; Hallman et al., 2016; Aktas, 2017; Ehtiyar & Baser, 2019).

Even for university students, assessment of creativity remains controversial (Ehtiyar & Baser, 2019). Currently, only grades, projects, and theses are assessed in higher education; only rarely is creativity a target of the assessment processes (Ehtiyar & Baser, 2019). Unlike younger students, university students are not often assessed, and observing teaching in classes with a large number of participants makes it difficult to assess the process. At the same time, university students who are not yet in the job market do not produce an assessable gain as is usually the case for adult creativity. Therefore, assessment in general and all indicators normally considered in other contexts are even more complex to implement (Jahnke et al., 2017).

Based on these considerations, it is clear that the higher education system, curricula, teaching, and assessment techniques need further changes for universities to play a role in fostering creativity, positively influencing careers and preparing students for future challenges and opportunities (Ehtiyar & Baser, 2019). In this way, universities will not only be knowledge factories but also open

zones where social change and cultural creativity can flourish (Papaleontiou-Louca et al., 2014). Furthermore, the pandemic has shown how places of education and learning, such as the university, can be incubation places for new creative ideas to support socio-economic growth in times of crisis (De Lorenzo et al., 2023; Sica, 2022).

CREATIVITY IN DIGITAL NATIVES OR DIGITAL STUDENTS: THE NEW EVER-CONNECTED GENERATION

The crucial role of creativity in the education system has been outlined in previous sections (McWilliam & Dawson, 2008; Hallman et al., 2016; Jahnke et al., 2017). All educational sectors benefit from fostering creativity to support students' development, from preschool to their entry into the workforce (Patston et al., 2021; Wang & Murota, 2016; Grey & Morris, 2022). However, in recent decades, an increasingly sustainable combination of creativity, innovation, and new technologies has developed worldwide (Susnea et al., 2014).

The educational context plays a crucial role in fostering creative and innovative skills, especially considering the increase in new media and technologies that students use in their daily lives. New technologies can be used in creative and innovative ways, contributing to informal education and learning (Ferrari et al., 2009; Beghetto, 2005). Today's students are growing up in a very different world to the generations before them (Susnea et al., 2014). To succeed in today's creative society, students must learn to think creatively, plan systematically, analyze critically, collaborate, communicate clearly, and learn continuously (Susnea et al., 2014).

Unfortunately, most technologies in schools today do not support 21st century learning methods. In many cases, new technologies are merely applied to old teaching methods (Susnea et al., 2014). In addition, teachers struggle to engage students' interest and attention. Current and future cohorts of students are growing up surrounded by video games, smartphones, and other digital media that have a major impact on young people's interests. This overwhelming proliferation of technology creates a large gap between the school and home digital environments, meaning the current educational framework is perceived as inadequate. For all these reasons, it seems clear that creativity and innovation are indispensable prerequisites for education today and in the future (Ferrari et al., 2009; Beghetto, 2005). This is especially true given the changes during the pandemic that have made schools and the world of work much more digital, with great technological advances and the associated learning of new and previous generations (Modgil et al., 2022). On this premise, a new generation of students is emerging. Who are they? Who is the education system of the new millennium aimed at?

The term 'digital native' was coined by Marc Prensky (2001), as opposed to what he himself called a digital immigrant. Starting from the debate about the decline of education in the United States, Prensky notes that the emergence of a new generation that has grown up with digital technologies and for whom tools such as computers, video games, music players, and mobile phones

are part of the everyday life that has always surrounded them (Prensky, 2001). According to the author, this radical change is one of the main reasons why the education system is no longer suitable for the new generation of students, also referred to by some as the Net-generation or Millennials (Smith et al., 2020). There is still much debate about the impossibility of defining the exact boundary between the generations of digital natives and digital immigrants: the transition was gradual, although some place the timing of the transition in 1985 due to the proliferation of personal computers in developed countries. Others argue that the timing of the transition could be between 1996 and 2000, when the first internet browsers came on the market and the web began to spread (Smith et al., 2020; Evans & Robertson, 2020).

Ultimately, much of Prensky's view has been tested and refuted in the literature over the past two decades, but recent studies of brain plasticity suggest that Prensky's idea that technology can change the way people learn is partially justified (Smith et al., 2020). However, it seems equally clear that not all of these changes are positive. For example, there is a growing body of research into the negative effects of multitasking and social media on learning and academic achievement (e.g., Twenge, 2017).

However, there is more agreement on the definition of digital students, which replaces the terms digital natives, Generation Y, Net Generation, etc. (Gurung & Rutledge, 2014; Creighton, 2018). Without creating a generation gap, this terminology takes into account the presence of digital technologies in daily life and the impact on learning experiences (Smith et al., 2020). Considering student characteristics and the speed at which they are changing allows education systems to be open to adaptations and modifications of curricula (Creighton, 2018). If, on the other hand, we settle for the stereotype of the digital native, to whom we ascribe innate digital skills, we risk losing valuable learning moments that we can offer to all students, regardless of their generation. Technology, which plays an essential role in the teaching and learning of the new generation, is a useful tool in education. Understanding how technological knowledge and skills are purposefully developed, rather than innate or possessed by students of a certain age, can help educators overcome digital native stereotypes by embedding digital literacies into broader curricula (Smith et al., 2020; Evans & Robertson, 2020; Creighton, 2018).

MEASURING THE CREATIVITY OF DIGITAL STUDENTS/DIGITAL NATIVES

Whether one wants to call them digital natives or digital students, it is clear that the new generation is growing up with new technologies that were completely unknown until a few decades ago (Evans & Robertson, 2020; Creighton, 2018). Therefore, one cannot pretend that change has not occurred and that it has not taken the education system and others by surprise (Smith et al., 2020). The new generation has new technologies and requires a leap in technology for the educational context, school subjects, and assessment of progress, including creative progress (Gurung & Rutledge, 2014; Creighton, 2018). The recognition that creativity has received in education in recent years (Grey & Morris, 2022;

OECD, 2019; CEU, 2008) has raised the urgent need for large-scale assessment and training of this skill (Henriksen et al., 2018). Therefore, there is a need to make assessment of creativity accessible to ensure an equitable education system that keeps pace with market demands (Henriksen et al., 2018; Rafner et al., 2022). Large-scale assessment can be enabled by the introduction of new technological tools that provide concrete opportunities to digitize the measurement of creativity in the classroom (Rafner et al., 2022). This consideration is even more vital considering that the use of new technologies is completely natural for digital students (Creighton, 2018).

Despite an acknowledgement of the usefulness of digital tools, almost all instruments used to assess creative potential in schools today are still old, standardized tests (Henriksen et al., 2018). Standard instruments have a number of features that sometimes complicate the assessment of creativity in the education system: they are often paper-based, were almost always developed in the middle of the previous century, and are suitable for a different generation than that of today's students. They are also very time-consuming instruments in terms of human resources, since their administration and evaluation require the labor of multiple observers and there is a risk of subjective assessments (Rafner et al., 2022). So, while learning seems to be increasingly digitized, the assessment of creative potential remains rooted in old instruments (Chuang et al., 2015; Barbot & Reiter-Palmon, 2019).

However, assessing creativity using new technologies is one of the rapidly developing areas of research (Chuang et al., 2015; Pásztor et al., 2015). Thus, the inability to assess creative potential using digital tools is not due to a lack of new technologies or a lack of successful attempts in the literature (Chuang et al., 2015). For example, with the advent of digitization, various technologies, including mobile technology, have made it possible to transfer paper-based assessments to digital media. These tools have become increasingly popular over the past decade, offering expanded opportunities for large-scale testing, simplified data collection and monitoring of creativity in shorter time frames (Pásztor et al., 2015).

While there are digital tests that are proving to be very flexible, the use of the old standardized, universal, easy-to-understand, and easy-to-find tests for creativity continues to predominate (Barbot & Reiter-Palmon, 2019; De Lorenzo et al., 2023). In the absence of digital tools that are easier to use, inexpensive and also widely available for daily use, it is difficult to think about how to systematically promote creativity in educational settings by monitoring the development of students' creative potential (Barbot & Reiter-Palmon, 2019; Pásztor et al., 2015).

ONGOING PROJECTS AND PROGRAMS: INTERNATIONAL PROPOSALS TO PROMOTE CREATIVITY

While the difficulties in digitizing creativity assessment remain an open issue, other progress has been made in promoting creativity in education systems. In particular, in the post-Covid period, some interesting proposals have been put forward at university level. The University of Taiwan, for

example, used the digital learning platform, Moodle, to teach engineering and computer science students critical and creative thinking using the SCAMPER strategy (Wu & Wu, 2020). As it is a digital and interactive project, these types of students are already used to working with new technologies, especially in countries like China, that encourage creativity even in the lower grades (Wu & Wu, 2020). The study of Chen and colleagues (2023), also conducted in Taiwan, investigated the potential of using digital storytelling for students' scientific creativity and teamwork in a scientific invention lab. The results showed that even after the short duration of the workshop, students reported a positive level of satisfaction with teamwork and the development of social skills. Another Chinese study involving several universities, on the other hand, dealt with the promotion of creativity through a graphic task. As the students were architecture students, the Revit Architecture software was used to promote creativity through digital education (Gao, 2023). The study of Hendrik and colleagues (2022) suggests that engineering students design new robot learning activities and analyze their implementation to increase figurative creativity. The results of the Indonesian project indicate good results for the use of robotics as another tool to enhance creativity. However, initiatives at the national level include that of the Indonesian Ministry of Research, Technology and Higher Education, which has provided students with a digital platform to promote creativity. The Student Creativity Program (PKM) aims to facilitate all Indonesian students to develop and disseminate their creative and innovative ideas, and also provides direct benefits in the form of financial support for the implementation of their ideas (Ismail et al., 2022). Despite the wider participation, the students who took part in the initiative were mainly from engineering, chemistry and biology domains (i.e., mostly from STEM disciplines). Other recent studies, such as that of Ritter and colleagues (2020), were conducted with the main aim of scientifically testing the effectiveness of a creativity training program for higher education. This study focuses on the evaluation of the one-year program "Brainnovation Six Step Cycle of Creativity," which is suitable for students from different educational backgrounds and combines scientific knowledge with practical experience; a successful experience for university students in the Netherlands.

CONCLUSIONS

As we enter 2023, almost three years after the Covid-19 outbreak, we draw conclusions to understand what we have learned in terms of well-being and prevention (Bourdin et al., 2022). The pandemic, like all major stressful and unforeseen events, delineated a before and an after. The scientific and technological breakthroughs of this time remind us that even in the darkest moments of history, good can come (Cohen & Cromwell, 2021). However, much can still be done. Before the advent of Covid-19, the modern, fluid society we live in questioned the role of creativity in this rapid technological and generational evolution (Henriksen et al., 2018). How can a transverse competency make a difference? How can one improve one's everyday creativity to better adapt to the context?

Several studies suggest that creativity plays a key role in development and lifelong learning (Brosowsky et al., 2022; Anderson, 2020). Throughout one's life span, creative thinking, flexibility, and creative adaptations support individuals as they study, work, and navigate an increasingly complex society (Orkibi, 2021). Everyday creativity guides adolescents and young adults in forming flexible identities that are ready to embrace the complexity of the world around them (Grigorenko, 2019). While systematizing such a dynamic construct still seems challenging, the pandemic has shown that it is indeed an implicit demand of communities in the face of new and stressful situations (Marciano, 2021). Creativity provides answers when the schemas one has are not sufficient to solve new problems (Patston et al., 2021). Creativity supported communities and individuals in all phases of the pandemic: the long lockdowns, the attempt to maintain routines, the need to continue educational and work activities (Palareti, 2020; Rabaglietti et al., 2021). Thanks to new technologies, creativity took shape and was shared worldwide. For younger people in particular, creativity is an enormously powerful means of expression for their mental, physical, and relational well-being (Sica, 2022; Ellis, 2022). Adolescents and young adults were the most vulnerable and were particularly affected by the psychological consequences of the pandemic in terms of distress (Binagwaho & Senga, 2021; Kauhanen et al., 2022). For them, the return to normality was even more strongly affected by the gap between the pre-pandemic and post-pandemic periods. Only an arduous adjustment process and redefining their own identity and goals enabled them to recover a more functional dimension of everyday life. But not everyone succeeded. Several studies show that more than two years after the start of the pandemic, young people in particular suffer the most severe consequences: depression, anxiety, sleep and eating disorders, drug use, self-harming behaviors, and high suicide rates (Landi et al., 2022). Given the important educational role that schools play in these age groups, it is interesting to note the contribution of schools to the well-being of students in the post-pandemic period. In recent years, the school and education system has played a key role in supporting young people and young adults during the pandemic and the return to normality (De Lorenzo et al., 2023; Saulle et al., 2022; Rabaglietti et al., 2021; Lattke et al., 2022). The school provided a connection to the world at a time in history when relationships were severed for health safety reasons. At the same time, the school's desire to maintain remote activities allowed students and teachers to unleash their creative potential to a great extent and set interesting problem-solving processes in motion (Saulle et al., 2022; Rabaglietti et al., 2021). Moreover, this system had to go through changes to approach the new generations of students: more technology and more focus on soft skills such as creativity. Digitalization has indeed become part of everyday teaching, also for creativity (Ferrari et al., 2009; Collard & Looney, 2014; Ehtiyar & Baser, 2019; Ellis, 2022; Cohen & Cromwell, 2021). But above all, the school and university systems take care of the mental and psychological health of young people. And while it is true that psychological well-being also results from possessing and nurturing certain skills, such as creativity (Binagwaho & Senga, 2021; Humes, 2011), it is not surprising that the education system is opening up to accepting creativity as a fundamental part of learning transverse competencies. However, there are still a number of obstacles and much resistance in educational institutions to this revolution (Beghetto, 2005; Craft,

2005; Bolden et al., 2020). Creativity in the education context can reveal its potential, but it needs more support from state systems—more resources and tools for creative work—as well as from individuals, continuous training, and the willingness to stand up for teachers and students (Sica et al., 2019; Kaufman & Sternberg, 2010). New technologies, digital technologies, and a renewed interest in psychological well-being can be key elements in enabling schools and universities to consider and value creativity within the educational pathway of adolescents and young adults (Aktas, 2017; Henriksen et al., 2018; Barbot & Reiter-Palmon, 2019). The scientific literature already supports this movement, which promotes the soft skills of young people and thus the socio-economic growth of countries (Grey & Morris, 2022; Susnea et al., 2014).

This review was written as an initial assessment of the relationship between creativity and the education system. As it is not a systematic review, it was only possible to provide a partial and not in-depth overview and, above all, it was incomplete on a methodological level as it was not based on a systematic selection of relevant literature. Therefore, the robustness of the results of the studies and any comparisons between studies were not specifically commented on. The present study also offers only a partial view of the international school and education landscape, as this is one of the areas where differences between countries and cultures are most pronounced. However, future studies, including through systematic literature reviews and meta-analyses, could deepen the relationship between creativity promotion and school systems, with a particular focus on international territorial settings and different school levels, with an analysis of the methodologies used in the studies considered and a comparison of the best practices of different programs implemented internationally.

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