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## COMMITMENT, CREATIVITY AND BRAINS: PERSPECTIVES ON GIFTED EDUCATION

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**Abstract:** *This chapter presents three current perspectives that come together to think about the educational practices of gifted children. The theoretical advances regarding commitment, creativity and the brain are discussed, lines of research that show the importance of promoting the configuration of instructional contexts that highlight differences in ways of learning, respecting*

*the times and styles of each person, from the socio-constructivist perspective. From a sociocultural approach, arguments are put forward for understanding that giftedness is the result of the joint interaction of multiple contextual and personal factors, resulting in the value of practices found in the model of the three rings.*

**Keywords:** *Commitment; Creativity; Brain; Education.*

This chapter presents three current perspectives relevant to gifted education: progress in relation to commitment, creativity studies and neurosciences. Currently, these lines of research refer to the importance of promoting instructional contexts that highlight the differences in ways of learning, respecting the time and styles of each person.

Based on the socio-constructivist model, the importance of developing situated practices and interactions with a wide variety of symbolic, physical and social resources is highlighted. There are several theoretical models that contemplate these topics which we intend to discuss in this chapter. From a sociocultural perspective, we find Tannenbaum and Mönks and Van Boxtel, who mention that giftedness is the result of the interaction of multiple contextual and personal factors. Specifically, from the model of the three rings, three components are emphasized: commitment to the task, creativity and evolutionary aspects, which together interrelate under certain educational circumstances (Renzulli, 1978; Renzulli and Gaesser, 2015).

This chapter is organized into three sections which, from a pedagogical perspective, approach in more depth commitment to academic tasks, creativity and neurosciences, as educational contributions towards giftedness.

## Possibilities and alternatives for commitment

Boredom is an emotion that is frequently cited in literature about giftedness. Despite gifted students tending to have great persistence, commitment and improvement in relation to school tasks, boredom is an emotion that usually emerges as a result of faster learning rhythms, or perceived lack of cognitive challenge in tasks. Relationships between high skills and boredom should not be understood as a cause-effect relationship, but rather as a feeling that can appear in every student facing activities that are outside their zone of proximal development (Feldhusen and Kroll, 1991; Guirado, 2015).

Boredom is defined as an affective state composed of unpleasant feelings, lack of stimulation and low physiological activation. Boredom provokes the sensation that time does not pass, so people want to escape from that situation. It is characterized by postures or gestures that denote demotivation, low involvement, lack of interest and little appreciation of the activity. Therefore, boredom can be described as an emotion that involves five dimensions, namely: affective, cognitive, physiological, expressive and motivational dimensions (Preckel, Götz & Frenzel, 2010; Perkrum, Göetz, Daniels, Stupnisky & Perry, 2010).

Boredom is characterized as a negative feeling against something repetitive, as the opposite of academic commitment and one of the main reasons for disengagement.

Commitment generates great academic interest in various disciplinary fields, including Educational Psychology; because it has a double function: preventing student dropout and general disinterest. A considerable number of models and definitions have been offered about this construct. In general, commitment is the level to which students are involved, connected and actively

engaged to learn and perform. More specifically, commitment to academic tasks refers to the intensity and emotion with which students are involved to initiate and carry out learning activities. Commitment is an energy in action that connects the person with the activity. There is a consensus that commitment is a constructive goal that includes affective, cognitive and behavioral aspects (Appleton, Cristenson, Kin & Reschly, 2006; Fredriscks, Blumenfeld & Paris, 2004; Rigo, 2017).

Landis & Reschly (2013) state that student commitment can be an essential construction for understanding, predicting and preventing school dropout and disinterest among gifted students. There are contextual factors that connect these students and other features that disengage them. That is to say, a multitude of factors, such as lack of structure and clarity in the assignment, lack of support towards having greater autonomy in decision making, low perception of the usefulness of what has been taught, or continuing absence of challenges, can influence the learning experience of the students, who end up assuming a more passive participation, decreasing their levels of involvement and self-regulation (Tze, Klassen & Daniels, 2014).

In this sense, some educational barriers for the promotion of enriched contexts are identified by Piske, et al. (2016), referring mainly to repetitive teaching, uniformity of knowledge and teaching practices that are rarely oriented towards designing a class that encourages curiosity and students' interest in learning. In part, as noted by Reis & Renzulli (2010), difficulties in adapting the curriculum derive from lack of teacher training, which makes it difficult to carry out modifications to instruction practices in order to respond adequately to the needs of students in general, and to the needs of students with high intellectual abilities in particular.

In particular, taking Renzulli & Gaesser's (2015) model of the three rings, we return to the dimension relating to commitment to the task in order to understand giftedness. These authors mention that intrinsic motivation is not always present or absent, but rather that it comes and goes in relation to the characteristics and features of some contexts and circumstances that are the result of educational experiences linked to a form of teaching that promotes it. From this point of view, two elements are key: school tasks on the one hand and the teaching role on the other. Studies on commitment show that challenging tasks are those that involve students to start the task, find information to solve it, participate in class discussions and maintain interest in the work proposal. On the contrary, tasks that are too easy tend to produce feelings of boredom and those that are too complex generate frustration.

Also, among the initial studies on academic tasks, some factors synthesized in the acronym TARGET proposed by Epstein (1989, in Huertas, 1997) are pointed out, i.e. the tasks that most generate motivation are those characterized by their variety and diversity, significance, authenticity, moderate level of difficulty and possibility of choice and control. Likewise, the model highlights the importance of feedback generated in the context of a class and the use of rewards, both to encourage group work and also to undertake evaluation based on criteria of achievement, whereby this is understood as a process; respecting individual learning times and promoting time management by offering guidance for planning, monitoring and reflecting during the development of the task (Rigo, 2017; Gentry, Gable & Springer, 2010; Piske, Stoltz & Machado, 2014).

More current contributions continue to highlight the importance of such features in the activities that are formulated to promote commitment, moving towards new aspects that

should be reflected in the formulation of instructional design and class planning (Rigo & Donolo, 2014). In this regard, there are contributions that emerge from the field of Neurosciences, which show the importance of novelty and estrangement in the formats and academic proposals for promoting not only what we understand as affective and behavioral commitment, i.e. to capture students' interest and participation, but also what we know as cognitive commitment, which implies long-term, lasting and meaningful learning (Acaso, 2015; Ballarini, 2015).

The role of the teacher in the classroom is to guide, rather than deliver information to children; to formulate open tasks, in order to monitor the learning process that students are taking, offering help to locate content, methodological techniques, or to help them understand how to use certain resources. These possibilities are enabled when research assignments are being carried out, using inductive logic, discovering and investigating problems that have a strong relationship with daily life (Renzulli, 2010; Rigo & Donolo, 2017).

In this framework, in order to formulate educational practices in line with inductive learning, the proposal put forward by Rigo & Donolo (2016; 2017) and defined as Problematic Situations, is promising for engaging students, as it makes propositions that at the same time are challenging, interesting and related to daily life, which are not solved in an hour, but involve a process that includes and is carried out along with instructional practices. These are problematic situations, because students need not only their previous knowledge to solve it, but also face the challenge of looking for new information to completely solve the problem formulated, while also being associated with circumstances arising in their lives outside school. It does not evaluate content or data, but rather the understanding of putting into play the central concepts of the curriculum to analyze a

daily situation. It has the strength to understand instruction and evaluation as recursive moments, enriched by formative feedback, understood as a dialogue through which the student not only receives information about their performance, but also has the possibility to participate in reflection about it; at the same time, the teacher receives feedback as a basis for modifying instruction.

We understand that student commitment and especially commitment of gifted students, is the result of the opportunities, the resources and supports that are provided through the school in order to develop it. This involves the challenge of thinking of the school beyond a place where information is simply received, towards a context for developing new and richer experiences to enhance the talents and capacities of children and young people, contributing to more authentic and less monotonous learning.

## Proposals from creativity

Creativity is one of the components that integrates this complex phenomenon of giftedness (Renzulli & Gaesser, 2015; Piske, Stoltz & Machado, 2014). Sak (2016) also highlights the importance of creative skills, the analysis of giftedness and the design of educational strategies. Authors interested in this area analyze creativity as an important aspect of giftedness and propose guidelines for the construction of creative contexts of teaching and learning. Our proposals are based on sociocultural perspectives of education (Rinaudo, 2014) and creativity (Glăveanu, 2015). We therefore emphasize the importance of mediations between teachers and students, collaborative work and activities that promote interaction with different objects and contents of the surrounding culture.

Our proposals are not limited to promoting learning and creative processes in gifted people, but aim to impact the educational contexts in general through the interactions between the different participants. Although creativity is an aspect that is currently considered in the evaluation of giftedness (Nakano, Primi, Ribeiro & Almeida, 2016), it is not usually a priority issue in the education of people with high skills. We agree with Piske, Stoltz & Machado (2014) in that *“the creative potential of gifted students has not received adequate attention in the school context, most times teachers are not prepared to attend to their needs”* (: 348).

We consider it essential to develop multidimensional evaluations and interventions with gifted people (Almeida et al. 2016; Nakano et al, 2016; Sak, 2016). We understand creativity as the potential of people to generate ideas and innovative and alternative products in different situations and contexts. Likewise, from the perspectives of problem finding and problem solving (Kozbelt, Begheto & Runco, 2010), we define creativity as abilities to formulate and solve problems based on interactions between divergent and convergent thoughts.

Boosting creative processes in the gifted does not appear to be a simple task. Putting forward activities and proposals that challenge students (Piske, Stoltz & Machado, 2014), promote curiosity, motivation and the development of thoughts and creative products is a great challenge for educators. In the field of giftedness, the educational model proposed by Sak (2016) is very interesting and includes three main components: analytical, practical and creative skills. Analytical skills refer to abilities to identify problems, develop plans, organize information, monitor processes, evaluate results and make decisions. Practical skills involve: control of impulses, perseverance, focus on objectives and results, implementation, responsibility, independence,



sensitivity, management of thinking styles and definition of priorities. Regarding the creative component, the author mentions seventeen skills to be developed in gifted education: redefine problems; question assumptions; generate ideas; market creative ideas; creative imagination; perceive multiple facets of knowledge; overcome obstacles; take risks; tolerate ambiguity; build self-efficacy; discover self; explore true interests; postpone expectations; model creativity; motivate self; formulate associations; and construct analogies.

We consider that the skills mentioned in Sak's model (2016) can be developed in different contexts inside and outside the classroom. In the classroom context, it is relevant for teachers to promote learning as a creative act (Beghetto, 2016) that involves novel personal interpretations (subjective moment) that are put into discussion with other students and teachers (intersubjective moment). According to Beghetto (2016) it is essential that teachers pay attention to the moments of the class where questions, comments and unexpected and original contributions emerge, offering aids, orientations and interventions that stimulate divergent thinking, originality and discussion among participants. Glăveanu and Beghetto (2017) propose stimulating creativity in the classroom based on dialogue and openness to different perspectives, that students and teachers put their different points of view into play in order to arrive at more creative positions.

Teachers can also promote creativity by designing activities, resources and teaching and learning strategies. Current studies indicate that the promotion of autonomy, the free choice of alternatives in solving tasks, the analysis of different resources and collaborative work are conducive to creativity (Davies et al., 2013; Lin, 2011; Beghetto, 2016). Regarding content, activities that promote relationships between disciplines and analysis beyond

the areas of knowledge, borders and enigmas not solved by isolated disciplines seem propitious. Creativity emerges from undisciplined knowledge that is related in a complex way (Elisondo, 2015). Likewise, creative thoughts and products stimulate those activities and educational proposals that generate surprise and are unexpected for students (Elisondo, Donolo and Rinaudo, 2013; Elisondo and Melgar, 2016).

Creativity is a socio-cultural process that implies relations between cultural subjects and objects, whereby promoting interactions with diverse persons, contents and artifacts is a way of fostering creativity. Research indicates that tasks outside the classroom (museums, fairs, NGOs, etc.), extracurricular activities and visits from unexpected teachers and specialists are perceived by students as opportunities for creativity (Chao, Chen & Hwang, 2013; Davies et al, 2013; Melgar, Elisondo, Donolo & Stoll, 2016).

It is also relevant for creativity that teachers offer performance models typical of creative behavior. Root-Bernstein & Root-Bernstein (2017) propose working in the classroom with creative examples, whether they be people, products or problems. According to these authors, exploring ways of solving and forming problems, strategies and situations involved in creative processes developed by other people or groups, is a way of stimulating creativity in the classroom. In short, in gifted education and education in general, it is important to build teaching and learning contexts that promote different skills and performances not only in the cognitive field but also and especially in the area of emotions and intersubjective links. There are agreements among specialists which consider it to be essential to develop creative educational proposals within the framework of respect, tolerance for diversity and cooperative dialogue between students and teachers (Beghetto & Kaufman,

2014). The development of ludic activities (Piske et al., 2016) is one of the ways to enhance cognitive, creative, emotional and social skills. Gifted education has the challenge of stimulating students and enhancing learning, without neglecting vital areas in human development such as intersubjective links and emotions.

### Giftedness: some approaches from the neurosciences

In the psychopedagogical field, it is common to find studies and approximations around subjects with learning difficulties or disorders. That is to say, there seems to be a predominant tendency of focusing on what is missing, on what is not incorporated or learned. The concept of giftedness emerges, however, when the issue is the existence of a surplus, rather than something that is missing.

Since its inception, this notion has been linked directly with intelligence. The interesting thing is that it is possible to agree on how we understand and define it. We can assure, as affirmed by Passer & Smith (2007), that intelligence provides the ability to acquire knowledge, think and reason effectively, and to manage the environment in an adaptive way. This last aspect is fundamental in relation to the subject we are dealing with.

From the perspective of neurosciences, Clark (2007) proposes that the brains of gifted people have more neurons, with more integrated and complex connections; a greater number of dendrites that create new and diverse connections, also glia that grow allowing greater myelination of axons, enriching the speed and quality of transmission of neural information. This is related to what Geake (2004) calls greater activity of the prefrontal lobes, which are responsible for the most complex functions of human

beings, such as the coordination of information from various sources, the elaboration of goals and plans, among others.

Jausovec (1998, 1996) presented evidence of a wider use of alpha waves in young people with high IQ during the performance of specific activities which would indicate a change in frequency, based on the electrical activity of the neurons, which would manifest states of concentration being able to adapt quickly to certain tasks. That is to say, they manage to be more flexible to attentional changes, compared to young people without giftedness.

Simonetti (2001) returns to these investigations in neuroscience and emphasizes that in our nervous system, especially in the relationship between brain and intelligence, it becomes necessary to deepen, both structurally and functionally, aspects related to physical, emotional, cognitive and intuitive issues in relation to giftedness. He states that studies have shown that the level of intelligence achieved by a subject is the result of an advanced and integral process within the brain. For this reason, he asserts that the concept of intelligence and, therefore, that of giftedness understood as intelligence development, must include all brain functions and, in particular, its efficient and integrated use. Based on this we could therefore assume that those people who present what we could call more intelligent behaviors, would necessarily have to manifest greater integration and use of the diverse functions of the brain. The author thus concludes that low frequency high amplitude alpha percentage is predominant, and that the frontal lobe plays a preponderant role in the cognitive processes of giftedness as well as speed in the resolution of tasks and the establishment of relationships.

These considerations allow us to affirm that it is not just a matter of predisposition or genetics, but that strength, integration, flexibility and complexity, around the brain development

characteristic of giftedness, needs opportunities to achieve such a construction, that is to say, a stimulating environment that collaborates with this particular dynamic.

In addition, when studying giftedness, there are authors who have related it for years with what they call dyssynchrony or theory of positive disintegration and who have even alluded to psychic over-excitability, as being responsible for advanced development (Ramiro Oliver, Marcilla Fernández & Navarro Guzmán, 1999; Gur, 2011).

Gur (2011) reviews various investigations and concludes that the main differences between people with and without giftedness lie in certain physical characteristics, or in characteristics of linguistic, cognitive and social development. With respect to the former, the investigations reviewed indicate that certain differences in size and weight can be found, that these people may have extra energy, but there is no evidence of psychomotor skills or superior physical development. In relation to the latter, they deploy a different language around the creative use of words, ask reflective questions, discuss problems and ideas, make broad descriptions, have a rich vocabulary, handle humor, and easily understand the figurative meaning of language. Regarding the development of cognition, their curiosity, their power to question, ask questions and solve problems stand out. They seek in-depth and detailed information about their own interests, with preferences for individual work without depending on others, as a challenge, showing some rejection of routines that sometimes become boring at school. They can understand abstract concepts and learn to read and write early before starting school. Finally, regarding the sociability of these children, some are rather withdrawn with their peers while others become leaders, are followed by others and often tend to make friends with adults at their chronological age. They may

be more sensitive to values and moral issues, to the expectations and points of view of others, but others are carried away by an almost natural hyperactivity that makes them distracted or leads them to doubt their decisions.

Therefore, although the first thing that stands out is the relationship with the high levels of intelligence that are usually present (Lubart, Holling & Ushakov, 2016; Arffa, 2007), over the years further issues have been determined in relation to aspects of personality of those subjects. Some studies come to interesting conclusions. For example, in relation to gender, although similar profiles can be identified, some differences between girls and boys show that the former are more sociable, open, affectionate and participative, as well as more enthusiastic, optimistic, self-confident, enterprising, spontaneous, socially daring, serene, peaceful and confident. While boys appear as smarter, quicker in the understanding and learning of ideas, conscious, persevering, moralistic, sensible, subject to the rules, with great force of the superego, manifesting good assimilation and adaptation to the rules and values that govern the world of the elderly, of soft and impressionable sensibility (Ramiro Oliver, Marcilla Fernández & Navarro Guzmán, 1999).

Therefore, it is essential not to speak of giftedness in general, but to pay attention to the particularities of each case. If we think about school contexts, the figure of the tutor or mentor is highlighted as fundamental, who collaborates closely from a pedagogical perspective, knowing the profile of each case, thus being able to intervene, whether by rethinking the curriculum, the methodologies, the academic results, favoring to a greater extent self-regulated and metacognitive behaviors in relation to peers and teachers in the various school situations. Promoting among gifted students (or not) a shared science of language, practicing and internalizing the habit of reflection, will help

them become more aware of their own metacognitive knowledge and the strategies they use to learn. Shared evaluation, between others and with others, providing motivating feedbacks, becomes fundamental.

Therefore, it is clear that a quality curriculum for the gifted should improve higher order thinking skills. We are referring here to metacognition, focusing on authentic interdisciplinary themes, addressing the needs of gifted students, being dynamic, flexible and including challenges. We continue to insist that it should not be a question only to be considered for students who have these characteristics, but for classes in general (Miedijensky & Tal, 2016; Kelemen, 2010)

## Final considerations

To summarize, this chapter shows three dimensions that interrelate in the development of giftedness, which will take place only when the individual interacts actively and dynamically with the educational, social and cultural context. In this regard, Blumen (2008) mentions that currently research suggests that its development is the result of reciprocal interactions between subjects and the environment, through which the genetic potential of the organism is updated. In such a way that, the greater the interaction between people and the environments -formal, non-formal and informal- as stimulating educational experiences, the greater realization of the genetic potential. Therefore, people need not only a supportive environment that offers them opportunities to grow and develop their genetic potential, but also a commitment to interact with the environment and develop creative thinking.

In conclusion, we present arguments aimed at understanding that if we offer opportunities to participate in varied experiences, students will have more possibilities to develop their talents at school in a creative and committed way; in this direction, the social environment is converted from a socio-cultural perspective into an important factor for maximizing the potential of the subjects in the process of development. For that reason, institutional design is a central aspect of educational experiences.

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