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INNOVATIVENESS AND CREATIVITY AS NATURE AND NURTURE

Abstract. The paper describes the concept of innovativeness and creativity from the perspective of nature and nurture. There is the description of basic concepts influencing the innovativeness and creativity from the human nature and educational point of view.

Keywords: innovativeness, creativity, business psychology, nature, nurture

1. Introduction

Science is still conducting research on any connections which might be found between genetics and creativity. Psychology has found a possible connection between genetic factors and above average creativity. An increased amount of the neurotransmitter serotonin increases the connectivity in the brain's posterior cingulate cortex. The posterior cingulate cortex helps in awareness and the internal thought processes common in creativity[1] Increased serotonin levels are a key factor in those who suffered from neuropsychiatric disorders, such as bipolar disorder, autism and schizophrenia[2].These disorders are all known to have a genetic component to them. We can see these disorders being passed down through generations with

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a higher probability of developing the disorder if it was already diagnosed in a close relative[3]. The disorder itself and the effect it has on the individual's thoughts and way of processing information can appear as creativity (taking a different outlook on the environment).

2. Innovativeness and Creativity from the Perspective of Nature

In other findings, the corpus callosum (the fibers that connect the two hemispheres of the brain), appears to be smaller in writers, artists and musicians. The conclusion is that a smaller corpus callosum forces both sides of the brain to work more independently of each other. This allows for a different way of thinking. This different way of thinking and tackling problems can be viewed as creative thinking. We can observe creativity in many children.

Children are uninhibited in their thoughts. Somewhere along the way, this creativity can disappear. There are genetic components which can create creativity. This creativity can transform into innovative thoughts[4].

3. Innovativeness and Creativity from the Perspective of Nurture

Despite the genetic component to creativity, creativity still needs to be nurtured. Children can be taught to fight against their creativity in many ways. By not being allowed to use their creativity, children may lose the ability to think creativity.

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This means that we must look at the education system. How is innovativeness, as an attribute, developed by the educational process and how is it fostered? The role of teachers and their methodology will be very important to the nurturing of creativity and therefore promoting innovativeness[5] in future generations[6].

There are the concepts of Big "C" Creativity and Little "c" Creativity[7]. The Big "C" Creativity (BCC) looks at creativity as being something specific to certain individuals, geniuses and prodigies. These individuals have a profound impact in society and are well known in their field and beyond, creating something entirely new. The Little "c" Creativity (LCC) defines individuals who have not reached that level of influence. These are individuals who will use their creativity to effectively solve smaller problems, that is, daily life problems that they might encounter. They are less well known. This is like Shneiderman[8] who breaks creativity down into two similar categories, such as:

- Revolutionary equivalent to (BCC).
- Evolutionary equivalent to (LCC).

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LCC is the type of creativity that we would most likely to be focusing on in an educational setting. BCC has an element of rarity. If we focus ourselves on LCC, we will also be able to influence and create instances of BCC.

LCC allows for the ability of creativity in all people. However, there is a higher capacity for creativity in early childhood[9]. This is the time that we must focus on fostering creativity. The development of creativity depends on if and how it is nurtured[10]. Creativity is often questioned as being something irrelevant to teaching, despite its positive benefits[11].

4. Innovativeness and Creativity as an Attribute Developed by the Educational Process

"to understand is to invent" – Piaget[12].

How do our current young students learn?

There has been a change in the way students are learning. In young children, we see much more use of electronic devices. This may be impacting young children's perceptions of knowledge intake.[13] Young students are expecting school to be like the rest of their lives. But school education still does not reflect this. There has been a push at schools, such as Northampton Community College, to create "flipped classrooms" where homework is an online assignment. Students are expected to use the internet to watch videos, read and do other work prior to the class.

This contrasts with lecture and rote memorization simply for the test. Discussion and group interaction can create a deeper understanding of the material and allow for creativity to blossom with the learned knowledge[14]. It is generally accepted that creative individuals may have similar traits, but this does not mean creativity is completely nature-based[15]. Because the information is presented in a way that mirrors the way students learn and research other topics

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in their life, they may be able to pick up information more quickly. This frees up time in the classroom to be more creative and discuss the material with each other and the instructor[16].

As we are defining creativity and innovation[17], teachers must also define creativity for their students[18]. Creativity is sometimes used for projects and other parts of work within the classroom but it is rarely defined. This lack of definition may lead to confusion and miscommunication between teachers and students. Instead of a teacher writing in the instructions "use creativity", they should define creativity to allow for better understanding or instead of writing the comment on a paper, "creative use of [insert]", explain how the work was creative.

Defining creativity for students may require a few steps:

1. A deconstruction of several current myths about creativity which are leading to a shared misunderstanding of the issue[19]ł
2. A discussion and framing of the implications of "newness and value" in the educational context[20]ł
3. An emphasis on the process instead of the product[21]ł
4. Implicit theories or myths about creativity.

There are two sides to creativity in early childhood:

- Children have less basic knowledge and by theory can be less creative.
- Children are uninhibited and can think more originally.

This simply means that we must adapt creativity to age and knowledge. This will allow for creativity across age ranges and knowledge levels. There are theories that creative can be viewed as a separate entity from knowledge acquisition[22]. Creativity is simply an expression. It can be used for educational purposes, but something not innately related to knowledge acquisition.

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Learning can be done in a creative way. Forming connections between pieces of information is an example of creative learning. Teachers can also teach from this perspective. Teaching by connecting pieces of information together from the class or other classes makes the information relevant and meaningful to the student. Active learning is a key piece of this puzzle[23]. This makes students responsible for their own learning.

Creativity can also be killed when teachers have the mindset that the "answer is known before the question is posed"[24]. This limits the students' creative thinking. If there is an answer, assuming there is a single correct answer, the student looks for that one answer. All other answers are automatically dismissed by the teacher[25]. One study shows that teachers do prefer an average answer to a unique one. The emphasis teachers place on avoiding mistakes can also be a great hindrance to leaning and creativity.

Students may not be raising their hands to answer a question or participate in discussions because they are afraid of making a mistake. Risk-taking is always associated with creativity[26]. It can be a paradoxical situation[27]. Teachers prefer students who stay in line, but this will hinder the creativity that they hope to achieve[28]. This desire for students to stay in line may be because it is easier for the teacher to keep track of progress and they may not have as much work to do. This is not completely the fault of the teacher. Teachers must meet all points of the curriculum and stay on a strict track of learning[29]. This does not allow for the freedom to teach creatively. The creative teacher may be seen as less of an authority figure[30]. From the teacher's perspective, a student's creative behavior may be seen as bad manners or challenging[31]. It is necessary for the teacher to be secure and to be creative to allow for creativity. In a study of 500 students, creativity of the teacher was one of the more highly valued traits of the teacher. The study found creativity to be correlated to teacher

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effectiveness[32]. It is necessary to take an updated look at traditional teaching methods and create new methods which will better suit students and enhance creative learning[33].

Conclusions

For the majority of professions, innovativeness and creativity are major assets[34]. Therefore, we must foster its development. We need to raise our children and teach our students while nurturing their creativity. This will have a great positive impact on them both socially and economically. It will also foster economic growth.

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