Design Education for Fostering Creativity and Innovation in China

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Chapter 9
The Neurolecturer as Model for Design Education:
Fostering Creativity and Innovation Based on Neuroscience

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ABSTRACT

Are there lecturers capable of educating a digital generation of players in state-of-the-art innovation and creativity techniques? Far-reaching challenge to accomplish, but hard to avoid if governments and institutions want to overcome the future challenges of the global economy, particularly emerging nations such as the 'BRICS' and 'MINT.' Education design can be instrumental to support a deep transformation of society, but the expertise needed in the classroom must be updated for a new era, characterized by educational approaches aimed at developing multiple intelligences. Teaching styles that match students' personality will enrich that process by taking into account their behavior when making pedagogic decisions. Cognitive neuroscience applied to learning will be a plus to ensure a deep transformation of design education in the in 21st century. The conceptualization of a new kind of lecturer, capable of carrying out this application is the center of this chapter.

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INTRODUCTION

According to The Economist (2013), and American business 'think tanks' (Shierholz, 2014), the latest crisis has three main causes: a lack of skilled workers, a lack of leadership abilities from those who caused it, and a lack of innovative creativity to anticipate it. An opportunity that cannot be wasted to nurture men and women socially committed through education.

A new lecturer in Design Education should emerge to move emerging nations towards a focus on creativity. The GDPis not exclusively based on economic indicators anymore (Bauman, 2001), but on intangibles like welfare, health and education.

Design educators are key players in spreading creativity and innovation in emerging nations by teaching differently. That will be easier with state-of-the-art syllabus characterized by passion and authenticity applied to Design practice.

Those who currently teach and aspire to upgrade their performance already know that emotions are rooted physically, and profoundly influence not only what people reason and feel, but how they reason and feel. If Design students do not know that, either they will not be able to make proper decisions, or will make self-defeating ones as future leaders.

Two main questions are considered in this chapter:

1. Are educators/institutions in China and other emerging nations prepared for a post-crisis time, characterized by the need for a more creative and emotional approach, capable of creating more suitable educational environments?
2. What kind of lecturer is the answer? What kind of lecturer can develop these environments and upgrade performance in both Design education and creativity-related industries? Furthermore, how is this lecturer going to be trained?

A designer is a holistic individual, used to go beyond limits, with an 'out of the box' mindset as driver to learn on permanent basis. A designer is someone who loves disruptive innovation, over 'sustainable' or incremental one (Christensen, 2011). Only Individuals alike can are capable of training them.

Descartes was wrong: "Cogito ergo sum" is not valid anymore (Damasio, 2005), a single rational way of education is not acceptable when emotions are taken as important as technical knowledge. Reason and emotion are both essential to form a holistic professional; emotions are innate and technical knowledge comes from university, it is necessary to get both in the right balance. Graduation from the 'school of life' is as important as graduating from University for any designer interested in social trends, season styles and local fashion. But are design lecturers in emerging nations transmitting this message?

EMOTIONAL EDUCATION AND CREATIVITY: A CASE FROM SPAIN

The Government of The Canary Islands in Spain, made a challenging decision in early 2014 by approving the inclusion of 'Emotional Education and Creativity,' in the primary education curriculum as a compulsory subject. The change aims to contribute on the recognition and expression of emotions, regulating, controlling and using them effectively. According to the technical report that recommends its inclusion, emotions are educable and, and this is something schools cannot ignore.

This initiative criticizes the accent set on classical education in the development of intellectual abilities to the detriment of the emotional ones, advocating the creation of spaces and specific times for the new learning.

This essential subject, includes three thematic blocks to be developed year by year throughout the six-year of primary school:

1. **'**Awareness and emotional literacy**',** in which students learn to perceive, validate, accept, classify and communicate one´s emotions and those of others.
2. **'**Emotional regulation**',** where they learn to manage conflicts and modify emotions appropriately, according to contexts and relationships.
3. **'**Creativity**',** where they develop self-confidence on their own creative abilities, as well as a favorable attitude towards reality and novelty. Knowing how to recognize and handle fear and frustration, helps them to develop resilience and to control their impulses (Infocop, 2014).

THE NEUROLECTURER

Emerging nations should consider developing similar models, if they aim to succeed in the global competition for creativity and innovation.

Creative industries are key for emerging nations like China, because as their economies grow, these countries must find other competitive advantages beyond low-cost manufacturing. However, creative industries require qualified educators who can meet the expectations of students and industry. China has nowadays one of the largest number of institutions delivering some type of design degree in the world (Siu & Contreras, 2016), yet, many have highlighted important issues with the Chinese education system that hinder the education of creative professionals (Wertime, 2015).

Former CEO of Hewlett-Packard and US presidential candidate, Carly Fiorina's comment that Chinese "are not terribly imaginative" (Wertime, 2015), has been

criticized as a sweeping judgement, but it highlights a common perception; that the world's second largest economy is short on home-grown innovation, as it is of the business and academic cultures necessary to nurture it. Chinese education has been widely criticized for having an inhibiting effect upon creativity, and for being more suitable for the formation of engineers rather than scientists (Allen-Ebrahimian, 2015). However, it is not for lack of efforts; the Chinese government has poured billions of dollars into research, development and innovation, and may surpass the corresponding spending in the USA by 2019.

Similarly, President Xi Jinping has emphasized innovation in his speeches; for the past 4 years, China has filled more patent applications than any other country, although state news agency Xinhua has described the quality of those patents as "poor' (Allen-Ebrahimian, 2015).

While some universities such as the Hong Kong Polytechnic, are currently combining innovation, design, and business. It is important to remember that Professor Mintzberg's claimed that MBAs should move from the current focus on Management 'by analysis,' to Management 'by attitude' (Mintzberg, 2001). Professor James Heskett from the Harvard Business School, also explores the emerging world a new manager that he calls 'neuro-manager,' someone who can learn which part of the brain governs how we feel, how we respond to stimuli, and how we react to challenges (Heskett, 2014). When educators learn about how the brain processes, recognizes, remembers, and transfers information at the level of neural circuits, they manifest that knowledge in the classroom, and that empowers students. This, as will be seen later, will constitute the foundations to determine the competences of the new type of lecturer that is being conceptualized.

This chapter aims, through a meta-analysis based research, and in-depth interviews, to conceptualize a new type of lecturer, namely a *'neurolecturer,'* as well as to describe a personality typology to detect 'neuro-teaching talent' in early stages. In addition, it attempts to determine the competences of this new kind of teaching professional, anticipating that, as education transitions from an 18th century model based on standards, towards a twenty-first century model based on individual needs, lecturers knowledgeable of the role of multiple-intelligences, and the role of emotions in learning, will be the norm.

DEFINING THE NEUROLECTURER

What will this new sort of lecturer be like when creativity and innovation are a must? This new professional will be the result of not only a professional, but a 'personal transformation age' related to reasoning and emotion, which is to take

over the 'information age' (Rivas et al, 2012). A neurolecturer is a holistic person, with a deeper understanding of the brain's cognitive and emotional functions, thus the name. This person embraces the way people—students—think, feel and act, to understand the way they learn as a whole. This is the tremendous opportunity we have these days, to take advantage of a better knowledge of how our brain works, to positively influence educational practice. These lecturers rely on their knowledge of neurology, to strengthen their role as teacher, and to identify poor teaching habits in classrooms. At the same time, students welcome tutorials that take into account student's emotional skills, and which lead to an enriched debate. The neurolecturer does not care about performance metrics, but on his own commitment, self-education and capacity to develop personal skills and abilities. These individuals know that the notion that IQ should be a benchmark of an individual's intellect should be dismissed (Rivas, 2012).

In training future designers; understanding how people feel is as important as understanding how they reason. Syllabus' related to creative disciplines can consider this to add value to a 21st century economy characterized by services and a more humanistic orientation. Knowledge of oneself and teaching vocation are basic to a neurolecturer. These kind of lecturers must be aware their own knowledge limitations; first of all about what they do not know, what they know partially, and what they know 'transversally' (Rivas et al, 2012). This person, eager to get a holistic approach, should be aware of how crucial it is to play a revolutionary role.

Any neuro-oriented professional, holds a balanced emotional-rational cognitive mix, characterized by:

1. The determination to discover passion in something concrete;
2. The compromise of making that passion valuable, by making it unique;
3. Feeling one's way, ignoring the risks before making a deal;
4. Listening instead of hearing, even in periods of silence or unexpected messages;
5. Observing and not only seeing, generating behaviors to get empathy;
6. Sniffing the air as a prior step to sound out the environment; and
7. Sampling and tasting to make sure fair decisions (Rivas et al, 2012).

These individuals have a deep understanding of the value of culture, regardless of which one. They look for an interactive communication, and not only the transmission of information. They search for experience and emotions, and not just for knowledge. Holistic designers like holistic people are used to learning everything, and not only the study of specific matters. They take results as the consequence of, and not only an exclusive goal. They grow up through learning from human relation-

ships and love people promotion and long-life learning. They make daily decisions and prefer divergent thinking and discussing against a simply verbalization of orders.

The purpose of a neurolecturer as future design educator, is to lend education institutions a new focus; turning towards the neurological and emotional fields, and in doing so, searching for new tools that could deal with what is unclear. Holistic designers discover the roots of what they and their team think, say, feel and do. All of this brings about a scenario of unprecedented learning improvements and continual growth never experienced before, and so expeditious, so competitive, that imitations will be hard to make.

For the neurolecturer, a great source of knowledge is one's own experience, one that does not need to be memorized, does not demand previous training and does not need to be analyzed once reached will sprout. It only needs to be enjoyed in person, as the most seductive act, taking advantage of any problem or adversity as the perfect opportunity to learn (Rivas et al, 2012).

These unusual individuals will never remain prisoners of the place in which they were born. They won't even speak their mother tongue in detriment of another, or be part of a culture, social or financial group that doesn't allow them to distance themselves from the events and situations in which they are immersed, so as not to lose a sense of perspective. And all the aforementioned can be justified by the decision taken by two adults (their progenitors) who decided to have a baby without musing on the role or kind of work that the child could do later in life. Unaware if this role would consist of being an employee of a company in the industrial sector or in services or in carrying out a particular job as a self-employed person.

AN AGENT OF DISRUPTION

Recent research (Doin, 2012) has confirmed what has been for long suspected, that across all levels of the education system, institutions still include in their make-up and organization a configuration similar to that established at the forefront of the Industrial Revolution of the 18th century. This productive and economic model still exists in many nations today. It is from this model, that a standard syllabus producing uniform individuals—working class—emerged. It is also from this model, that technical and functional subjects were given priority over artistic-oriented ones, as technical subjects are easy to measure—thus evaluate (Robinson, 2010).

Some of the features that define this educational system can easily be observed in many schools and colleges:

1. Bells and sirens which regulate the movement of pupils, inappropriate in the society of TIC[4].

2. Separated by departments or enclosed areas, as if avoiding individual differentiation.
3. Evaluation of memorization or deductive reasoning without considering emotional issues.
4. Graduation at the end of a cycle, as if referring to the fabrication date.

The situation gets worse with the hindrance of the Enlightenment with its 'encyclopedism' and the reduction of intelligence to mere deductive reasoning, not the ideal model to educate designers. Such a model, discriminates against brilliant people for not fitting in the system, and encourages the accumulation of knowledge as if the mind was a warehouse, whose value depends on the number of articles it can store and remember, what Noam Chomsky refers to as 'the empty vase' model of education, in which the immersion in the cognitive experience, the preparation for an early assumption of risks, and with the promotion of creativity and innovation are ignored. The composition of standard courses based on age, without personal information about each student, does not facilitate awareness of the talent destiny of each student. Such a system, promotes knowledge which is harmful, slow and evasive.

NEUROLECTURER: COMPETENCES FOR DESIGN EDUCATION

No person who is not a great sculptor or painter can be an architect. If he is not a sculptor or painter, he can only be a builder. (John Ruskin)

According previous research (Rivas, 2012) there will be a three-fold self-development process for any neurolecturer. This process derives from extrapolating the work of Heskett (2014), who conceptualizes a 'neuromanager,' and which is adapted here to the classroom environment:

1. Searching, for what is not under control because of the opportunity to gain vivid experiences.
2. Confirming what is perceived through the senses, and intuited, as a way of emotional development.
3. Contrasting what is known, with what is thought, and gain new knowledge from this comparison.

Anyone who aspires to be a neurolecturer faces the challenge of being convinced that the first vocational symptom of this new role as self-manager and neurologist, is to give up, without complaint, any comfort zone; these individuals are never prison-

ers of their origin whether in terms of language or geographic location. Similarly, a neurolecturer must be aware of the level of mastery that they have of any subject they aspire to teach:

1. **Unknown**: From general to specific;
2. **Partially Known**: Lack of practice or dated knowledge; and
3. **Transversally Unknown**: Matters beyond the core-subject.

Remaining a prisoner of one's place of birth is not inspirational for a designer, willing to gain knowledge of overseas trends and avant-garde movements, but what is the message that design students in China are receiving from their lecturers? According to personal experiences, old habits and established routines remain against new trends and overseas influence in China. It is therefore important to renew the education system as soon as possible in order to facilitate Design education performance on creativity and innovation.

In such a scenario, neurolecturers assume that a university degree or the lack of one, is nothing but a starting point, and never a destiny. They also understand that practical knowledge is acquired better when senses that intervene in the learning process are engaged, a "cognitive-sensorial immersion" that occurs when faced with the unknown or "transversally unknown" (Eker, 2007).

For a neurolecturer, the classroom is a tool for getting to know people who can become allies in the development of pedagogical opportunities (Rivas, 2012).

The communicative capacity of these individuals, should be such, that they make their presence felt, without necessarily speaking a word. They are familiar with the body language of the cultures that they work with, are capable of approaching the language of music, theatre, or other artistic form. In that way, they gain in sensitivity.

The main personality traits of the neurolecturer are:

- Empathetic
- Holistic
- Creative
- Disruptive
- Open-minded
- Sensitive
- Entrepreneurial
- Ambitious
- Curious
- Responsible
- Determined

How many of these attributes are the attributes of the average lecturer in Design schools? How about Design schools in China?

RICHARD BRANSON: A CASE STUDY

Knowledge is not what you remember but what you don't forget. (Confucius)

The individual who takes the plunge into neurolecturing must be interested in finding the greatest opportunities, without being limited by conditions (Rivas, 2012). This is because they do not exist in the mind, so these individuals can identify and enhance the most unimaginable possibilities.

Sir Richard Branson demonstrated it himself, as a holistic person and service designer, he has become the prototype of an innovative and disruptive neuro-entrepreneur. Founder of Virgin, the company that revolutionized service design by going from music delivery to fitness gyms to suborbital trips, Branson was not inhibited by the fact that, in another, not so distant epoch, the space travel sector had been reserved, almost exclusively, to astronauts. It wasn't hard for him to change this paradigm and launched 'Virgin Galactic' a pioneer company in space travel, to cover an emotional necessity.

In a great example of what a neurolecturer could be, in 2007, he talked about the first suborbital trip teaching to the global audience about how to make it possible. Such individuals never lose the opportunity of participating in what seems remote, bizarre and worth diving for. So long, entering those hidden zones they find personal development facilitated. They will never be unwilling to use all their physical, mental and intellectual strength if, in return, they gain in knowledge or experience. What does this mean in the case of an educator?

NEUROLECTURER: THE SCIENCE BEHIND

The brain is a product of millions of years of evolution, and is engaged in the fast hunting and capturing of rewards, aligning as many neurotransmitters as possible for this purpose, and in some cases triggering off aversion to the risk or pain. The functions that the brain has evolved to perform are, amongst other:

1. To live in society, get known and form relationships;
2. To develop activities towards concrete and specific goals;
3. To avoid danger or the aversion at loss or the negative;

4. To interpret data in order to make judgements and behave oneself; and
5. To make decisions and assume the consequences.

These influences all lecturers on their decision making process, the big difference is that neurolecturers are aware of it. And thus are fitter to lead a paradigm shift that would favor the development of creativity and innovation (Rivas, 2012). In consequence, a core syllabus should be defined to transform lecturers into neurolecturers, if emerging nations are determined to foster creativity and innovation through their education system.

Recently, Velasco and Megia (2011) have confirmed that the brain does not seem to be very well-prepared for dealing with the complexities of modern life, and our education system is one of such complexities. The current make-up of the brain has the imprint of its evolutionary past with three areas going from the most ancient to the most recent; these are described according to their phylogenetic chronology:

1. **The Reptilian Brain:** This regulates the basic body functions such as cardiac rhythm, breathing and temperature control; mostly subconscious.
2. **The Limbic System:** This controls the subconscious emotional responses such as the state of fear. It is a source of motivations and primal emotions which includes euphoria and panic.
3. **The Prefrontal and Cerebral Cortex:** The last structure to be developed phylogenetically. Within it we can find essential functions such as logical reasoning, abstract thought, calculus, learning and decision-making (Mac Lean, 1990).

It is extremely important that the neurolecturer's mental activity obtains the greatest 'reward' with the least amount of pain or 'loss.' The ultimate goal of a neurolecturer will be to use his knowledge of the brain functions to deliver unique and rich lessons, rationally and emotionally equilibrated.

FUTURE RESEARCH

Adversity is the cornerstone and inspirational source that drives evolution (Darwin, 1859). The Homo-Sapiens defeated The Neanderthal by discovering and perfecting his shooting technique, and replacing the cave as living environment, leaving a cannibalistic way of life behind (Rivas et al, 2012). In a similar way, a new species, namely "Neuro-Sapiens" is being proposed as a new evolutionary step, in which neurolecturers aware of the importance of keeping a balance between reasoning and emotions are due to run the education system.

At this stage, twenty first century Designers could play a key role as early "neuro-sapiens," moving forward design in emerging nations. But it is necessary to develop the necessary theories that support both: their emergence, and their work, theories of intelligence show how to train this 'new species,' at the moment, the closes that we have, are Gardner's (1993) and Goleman's (2005) theories. If adversity is an inspirational source to be more creative, it has not yet yielded substantial results in Asian countries, some of which have gone through difficult historical periods; Chinese education is considered more suitable for cultivating engineers than artists (Weir, 2015). Finding the answer to this seemingly paradox undoubtedly demands future work of research and analysis.

CONCLUSION

Culture and traditions are among the things that generate habits and routines which attempt largely against renewed ways of doing things; neither teachers nor educational institutions from China and emerging countries are ready to face a post-crisis time in which a more creative consciousness will be essential to survive amidst increasing competition. Educational governance is a tough issue but clear and informed decisions are a must. They should be made on time to start the process of transforming the current education paradigm based on developing student's rational abilities.

The brain houses the mind and education develops it. Identifying educational goals and challenges will be the kind of mind that will characterize future generations of design lecturers, making decisions that will set the path that, nations, corporations, and education institutions shall follow. In this chapter, a new concept of lecturer has been presented, an education professional with a holistic approach, and knowledgeable about brain processes and the role of emotions in a person's development.

The neurolecturer possesses necessary cognitive and emotional skills to be the classroom's architect and manager. A great opportunity for visionary countries, but also for those lecturers eager to be part of this paradigm shift, never before has a lecturer faced his profession like an emotional immersion. Just like a mental athlete, the neurolecturer shall train for the big race. The decision of whether to pursue that challenge or not, will depend not so much on his natural skills, but on a commitment to enhance them, and develop the right abilities to achieve a higher performance in the benefit of his/her addressees.

Depending on their ability to crystalize their creative potential, emerging nations, representing the hope of growth in the world, will succeed in the global economy. A new approach that enhances syllabus in design schools, based on this orientation, can start an educational revolution with the neurolecturer at the center.

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KEY TERMS AND DEFINITIONS

Brain: The organ of the body in the head that controls functions, movements, sensations and thoughts (Merriam-Webster).

BRICS: It´s the acronym for an association of five major emerging national economies: Brazil, Russia, India, China and South Africa. The grouping was originally known as "BRIC" before the inclusion of South Africa in 2010 and was coined by Goldman & Sachs (Wikipedia).

Cognitive Neuroscience: Academic field concerned with the scientific study of biological substrates underlying cognition, with a specific focus on the neural substrates of mental processes (Wikipedia).

Disruptive Innovation or Technology: Innovation that creates a new market and value network and eventually disrupts an existing market and value network, displacing established market leaders and alliances. Also implies significant societal impact (Wikipedia).

Experience: A repertory of cognitive skills -abilities and capacities for recognising patterns- developed throughout life which enable us to approach and interpret situations with familiarity creating behavior routines (Rivas et al, 2012).

Guanxi: A Chinese social concept based on the exchange of favours, in in which personal relationships are considered more important than laws and written agreements (Rivas et al, 2012).

Holístic: Relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into part(Merriam-Webster).

Mind (Alternative Use for Brain): Part of a person that thinks, reasons, feels and remembers(Merriam-Webster).

MINTs: It's an acronym referring to the economies of Mexico, Indonesia, Nigeria, and Turkey. The term was originally coined by Fidelity Investments, a Boston-based asset management firm, and was popularized by Jim O'Neill of Goldman Sachs, who had previously created the term BRIC.

ENDNOTES

1 **GDP:** Gross Domestic Product.
2 **IQ**: Intellectual Quotient.
3 **GPS**: Global Positioning System.
4 **TIC**: Technologies of Information and Communication.