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How to Increase Intuition for Entrepreneurship Spirit in Innovation Process?

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Abstract. In 2017, how to increase intuition for entrepreneurship in innovation process? Especially for generations to come, who are the current students, now faster and natively digital because they are born with a phone or a tablet in hand? They are fully connected and always active on social networks, which diverts their attention during the course. Thus the simultaneous use of several media captures their attention, that is the reason why we have to change the way of teaching with variations of rhythm if we do not want to be faced with an army of computers that ramparts between teacher and students... Beside their attention time is reduced and consequently the lesson has to be more fractionated. We introduce in this paper how to increase the digital natives' attention with a new teaching method we named: "Intelligence, Creativity & Intuition". Our method is based on three learning channels: Visual, Auditory and Kinesthetic.

Keywords: Pedagogy · Innovation · Teaching · Intuition · Entrepreneurship

1 Introduction

Crises and transitions cycles are the cause of the mutation of the world we are currently living. We're living a fabulous time where digital technologies are shaking the world and enabling engineering students to develop new abilities as well as deeply changing their relationship to information and knowledge.

For over a decade virtual and augmented reality has revolutionized the design methods, the innovation process and the relationship between the Engineer and the Product. Those technologies have widely impacted the value chain of the company and its organization. Those ones have now to be more agile and human (Laloux 2014).

In 1995, we created one of the first postgraduate training at the University of Angers in France to master the "Strategic Information". Three years ago, we opened the first engineer cycle "Intangible Assets and Knowledge Management". These new programs anticipate the evolution of current issues. And today, the classical teaching methods no longer meet students' "digital native" or "Y Generation" needs. They have shorter learning cycles, different decision-making processes and a new form of more agile intelligence.

Each generation has had its own centers of interest depending inter alia on the economical and social environment. Bobos in the 50's were centered on anti conformism and on the individual's interiority, Yoyos or Generation X in the 90's were more «I, myself» orientated whereas Generation Y «digital natives» are centered on human link with the others thanks to the new technological tools.

Generation Y's engineers do not have the same values, needs and desires as Generation X. Their temporality is not the same as its predecessor because they are born with an iPod in hand. Today thanks to social networks, phones and other tablets there are totally connected.

Those young people are subjected to so many temptations in their daily life with the web and social networks that they hardly maintain attention in the classroom.

Their attention should be captured when using multiple media at once and we must change the way of teaching with variations of rhythm if we do not want to be faced with an army of computers that rampart between teacher and students... The proposed experiment can punctuate the course to keep the attention of students, to interact with them and involve them in the educational process. For example, we start the course with a musical introduction to achieve a symbolic break with the previous course.

Then we continue with a question on a topical issue related to the course. At the end of the replies and exchanges with students, we begin the main course itself, which alternates theoretical elements and practical applications embellished with images. Then at some point, we stop the course with a shifted video on a subject not directly related to the topic of the day.

The goal is to change rhythm and refocus attention on a new subject for a few minutes. Then a short debriefing session is important to mentally integrate the main points of this video, so we take the rest of the time to do it. With this experiment, we observed that students closed up their computers after a few minutes.

This approach refocuses attention on what happens in the classroom. It is a “zapping” method we use and impose them and which has the advantage of synchronizing the course at their current level of attention (Generation Y). We'll show how the introduction of “zapping” in our own teaching provides a real added value in active learning.

On one hand we'll present the theoretical foundations of this method and on the other hand we'll develop the special alchemy of pedagogical sequence that produces amazing and promising results for accelerated Innovation Education.

2 New Way of Learning

At the University of Angers, the Institute of the Engineering techniques of Angers (ISTIA) was a pioneer in the integration of the new technologies and it opened Trainings of Master and Engineer very original at that time.

There was for example the creation of the Masters such as “Strategic Information and Technological Innovation (1996), Digital Modelization and Virtual Reality (2000) and regarding the engineer curriculum, the option “Intangible Assets and Knowledge Management (2012) which trains the Engineer of the knowledge of tomorrow.

Today our engineer students get new skills based on ever more accessible technologies. These skills make them develop new agilities and they broadly influence their vision of knowledge and learning and their relationship with their teachers too.

Why do the classical teaching methods no longer meet the digital generation students' needs? Each generation has had its own interest centers according to the economical and social environment. "Bobos" in the 50's focused on the fight against conformism and the interiority of the human whereas "Yoyos", generation X in the 90's were more "me" orientated. Generation Y also called Millenials are centered on the human link with the others thanks to the new technological tools. "Millenial generation" people have different values for their experience is different from the one of generation X. Students are faster with digital because there were born with a phone or tablet in the hand. They are fully connected and always active on social networks which diverts their attention during the course (Robinson et al. 1999).

Their attention should be captured when using multiple media at once and we must change the way of teaching with variations of rhythm if we do not want to be faced with an army of computers that rampart between teacher and students...

3 New Teaching Method

We have decided to experiment a new type of course we called "brain shaking", about "Innovation, Creativity and Intuition" (ICI) with the aim that our students improve their intuitive, emotional, creative, innovative skills (Goleman 1995; Corsi et al. 2006).

We have investigated several ways in the developing of new pedagogic methods. We are going to show you the method enhancing the development of intuition with engineer students. The tested method consists in 7 Steps: Step 1: musical introduction, Step 2: course sequence "brain shaking", Step 3: Zapping of the course, Step 4: course sequence "Five I", Step 5: Exercise of music and kinesthesia, Step 6: feeling of intuition, Step 7 course about intuition..

3.1 Step n°1: Musical Introduction

The course starts with a musical introduction which creates a kind of decompression chamber after their previous course or activity and contributes to regulate their mood too (North and Hargreaves 2009). It is important to note that the effects of music are different depending on the introvert or extravert nature of the student (Doyle and Furnham 2012).

Some researches (Campbell and Hawley 1982) show that in library introvert students choose isolated places to study and are only 25% to listen to music while working whereas extravert students prefer to sit in noisy places and are 50% to listen to music and study at the same time (Daoussis and McKelvie 1986).

We are definitely aware of the fact that listening to music can either have a focusing effect of attention or have an attention scattering effect. Our goal as teachers is to open a new space-time at the beginning of the course.

We do notice concerning some students that they relax, with a smile in a couple of seconds and according to the researches of Olds and Milner (1954), the feeling of pleasure may be increased upon activation of a brain area called «reward circuitry».

This “pleasure and joy effect” which occurs by secretion of neuromediators such as dopamine and oxytocin has been observed in many works (North and Hargreaves 2003; Blood and Zatorre 2001; Salimpoor et al. 2011). The music has indeed an effect on our feelings expression, on our memory and on learning upon activation of the tonsil and all subcortical nuclei located in the temporal lobe (Blood et al. 1999; Koelsch et al. 2005, 2006). Lots of researches have shown the influence of music on people well being (North and Hargreaves 2003; Lesuik 2005; Schellenberg 2005). We have made the assumption that music could bring wellness to the students and could play on their listening capacity, on their attention, and thus improve their presence “fully alive”.

According to H. Platel, researcher in neuropsychology at the University of Caen “The pathways of music in the brain are much more complex than those of speech, for example, and seek different brain areas: music stimulates, relaxes, soothes pain, but also has the ability to increase plasticity of the brain and causes changes in synaptic connections”. For the professor, listening to music while working stimulates memory and makes feel less tired (Fig. 1).



Fig. 1. Vibrations and music influence to the memory.

Besides listening to music induces a change in the skin conductivity, a change in heart rate, breathing and body temperature (Salimpoor et al. 2011). It generates lower negative emotions and change in time perception.

We start the course by some pieces of music chosen by the teacher whose duration varies between 2 and 3 min. This listening step lets the students finish to sit in the amphitheater and to release their mental during this musical break. We have noticed the students group got calmer, more attentive at the beginning of the course. Today the students of Generation Y have a musical culture for they listen to music every day through the natural access to online platforms such as musique: Napster, Spotify, Deezer, Apple Music, Rhapsody, Rdio et Google Music. To increase the efficiency of this musical introduction, every student should ideally be able to choose his own music to be 100% a source of pleasure and motivation as revealed by the work of Krause et al. (2014).

3.2 Step n°2: Course Sequence “Brain Shaking”

This step consists in making the engineer student think about the way he questions the world and he questions himself. The idea is to make the student aware of the fact his certainties can limit his vision of the world. They also restrain in his creativity and in his exploration search fields.

Our ancestors used to consider the earth was flat. This collective belief was challenged by the discovery of the Geocentric model (the sun turning around the earth), then itself later challenged by the Heliocentric system notion and finally replaced by the idea of the solar system we all today believe in. Important is to recall that those scholars were in trouble when they supported those theories.

Nowadays with the Einstein Theory of “Quantic entanglement” and gravitational waves (observed in 2015), we may be at the era of a paradigm change and at a beginning of new scientific inquiries.

For the students those inquiries lead to think about the impact of the scientific certainties on the world. It means to wonder which current scientific assertions may make our great children smile in the future.

This is important in the questioning of the students facing their beliefs and thus their limits. The fact that a student believes that something is impossible, makes it impossible, whereas if he thinks it is possible, until proven otherwise, then he can explore his limits to check all possibilities to act.

Seneca said: “It is not because things are difficult that we do not dare, but because we do not dare that they are difficult. Extrapolating this quote, we can say “This is not because things are true that we believe them, it is because - as we believe them they become true”. If the student realizes that “the only limits are the one that we impose” then he can allow himself to be more creative, inventive and innovative.

3.3 Step n°3: Zapping of the Course

The zapping step consists in diverting the student’s attention from the course matter to another issue for a couple of minutes. For that we use some 1 to 3 min videos about issues like: dare to do, fears, confidence, assertivity, the power of an idea, mental silence, presence, the power of words, and the non judgment. Students will be first asked to explain the subject dealt by the video. Then a discussion break will enable the students to intervene and react. Finally the teacher will formally debrief the video. This short film said to be a zapping step in the learning process enables to capture the attention of the group, making them concentrate themselves again before coming back to the course issue.

An example: My Fears, video to see “Dare”: https://www.youtube.com/watch?v=sb2YOg_dkQM, The video shows people in situations of fear. Those people when they face their fears and overcome them, realize then they succeed in doing things more easily. Fear can therefore be considered as the distance between me and my reality. The idea of the video is to show that often the thing holding us in our head.

If students ask how to get out of his own fears, we can make them watch video “Your deepest fears”: https://www.youtube.com/watch?v=2_fDhqRk_Ro.

In this video the character says a bright text of Marianne Williamson: “Our deepest fear is not that we are inadequate. Our deepest fear is that we are powerful beyond measure. It is our light, not our darkness that most frightens us. We ask ourselves, Who am I to be brilliant, gorgeous, talented, fabulous? Actually, who are you not to be? You are a child of God. Your playing small does not serve the world. There is nothing enlightened about shrinking so that other people won’t feel insecure around you. We are all meant to shine, as children do. We were born to make manifest the glory of God that is within us. It’s not just in some of us; it’s in everyone. And as we let our own light shine, we unconsciously give other people permission to do the same. As we are liberated from our own fear, our presence automatically liberates others”.

Students will reflect on their deepest fears which limit their action and work to dissolve them.

3.4 Step n°4: Course Sequence “Five I”

This step lists the “5 I” of the perfect creative, intuitive innovator. For our pedagogic team, the right innovator must develop his inspiration, imagination, his different intelligences, his recklessness (insouciance in French) and his intuition. Each notion will be presented and explained and connected to the others.

Inspiration is based on ideas coming from the nature (like biomimetism), from the arts and more generally from outside of yourself.

Imagination finds its origin in your readings, your education and your dreams. The development of imagination is possible through the book reading, even science fiction comics, that’s why we bought over 100 science fiction books in the library for students.

Intelligences according Gardner (1999) are the logic (ability with mathematics and numbers), linguistic (ability with poems and literature, kinesthesia (ability to learn with doing something), interpersonal (ability with myself), intrapersonal (ability with other people, with my fiend and my family, emotional (ability with my feeling, my emotional maturity, musical (ability with rhythms, spatial (ability with 3D space) and naturalistic (ability with the nature). The student realizes the multiplicity of the intelligences shapes. He can assess his level in each intelligence type.

In an oral exercise, in circle we can make them speak in pairs on their types of intelligences (Fig. 2).



Fig. 2. Students during an exercise talking about their intelligences types

At the end of this sequence we note that inspiration and imagination can be increased, everyone has his own intelligences, recklessness and intuition are rarely approached in teaching. The challenge is to make the student discover how to develop his intuition (Samier 2014).

3.5 Step n°5: Cymatic, Music and Kinesthesia

A first video about cymatic presenting the principle of the wave creating the shape according to Jenny studies (1967, 1974) is played. (<https://www.youtube.com/watch?v=WaYvYysQvBU>, <https://www.youtube.com/watch?v=3-Mc41OO0ho>) (Fig. 3).

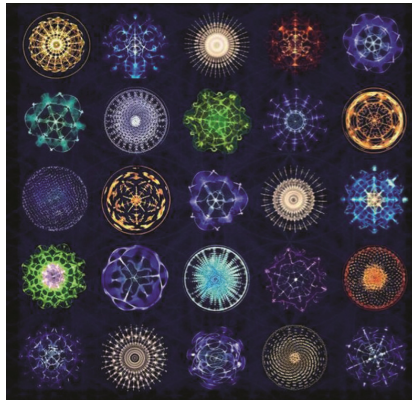


Fig. 3. Vibrations according to the frequencies create geometric shapes that are different.

As we can see in the video, the vibrations also create shapes in the water and as our body is more than 70% water, we can question if the vibrations have an influence on the water in our body and if they temporarily alter certain forms of liquid parts. And since music is a form of vibration, we can conclude that music affects our body.

Thus the students realize that music, as a vibes has an influence on the vegetal, animal and human world. They will be able to feel music (drums) and unleash their body expression blindfolded (by a mask Quies for example) in order they can't see each others. This exercise takes place in a large room so that the students can move 7 to 10 min long. Then at the end of the piece of music the students remain standing without any movement feeling their breath and sensations inside. They are now ready to feel their intuition.

The exercise, led the student to "let go of the mind" in order to focus on the vibration of the music, the movement of their bodies and attention to their breathing. After completing this sequence, we can then experience the feeling of intuition.

3.6 Step n°6: Sequence "Intuition Feeling"

Another music, calmer this time, starts this step. The students are asked to breath according to a guided "squared" breathing method and this 5 times as follows: They

have to breath in 5 s, block their breath 5 s, breath out 5 s, block their breath 5 more seconds.

The idea is to keep students' attention on their breathing by having letting go of their mind through "African Drum".

Then eyes closed with the thumb and index finger, they will measure their pulse under the throat and observe it, feel it (amplitude and frequency).

With their free hand, they will slightly hit the pinna (ear part) from the back to the front of the ear in order to feel the increase or decrease of the radial pulse fluctuation. Then the pulse becomes normal again. This perception of the radial pulse variation (Vascular Autonomic Signal) was discovered by Doctor Nogier and Nogier (1985). He studied the interdependency in the functioning of the psychological and biological systems which impacts the radial pulse.

Feeling this variation is a possible access to your intuition. Your intuition tells you what's good for you. So if this fluctuation is lower this will mean it is positive for you. On the contrary a stronger fluctuation has a negative meaning.

Once they are aware of their pulse variation the student should be able to test their own sense of intuition, for instance by using the "U theory" (Sharmer 2008).

3.7 Step n°7: "Intuition" Course Sequence

This so-called inverted last step (for the theory arrives after the practice) develops the different theories concerning intuition. Some philosophers like Aristote, Kant, Bergson, Jung and scientists like Pointcaré, Einstein, and even a musician like Mozart have all expressed an opinion about intuition without being able to describe how it works and how to use it (Shirley 1996). None said how to develop it and for us, it's Schulz and Lisa (1998) and Hogarth (2001), who has opened a gate for teaching intuition.

In a second time we approach the theory of the "Vacuum Auricular System" together with the cymatic concept to make the students understand the phenomenon of intuition felt in the previous exercise.

4 Discussion

With this workshop "Innovation, Creativity, Intuition" we can see the engineers are aware of their intuition, they are more creative, are clearly more able to innovate.

The seven proposed steps are necessary to challenge their limiting beliefs, to connect to their breath, to feel their body and let go of their mind, which blocks the access to intuition.

Their new discovered intuition capacities enable them to take decision faster in projects and hence are more efficient and productive. As a matter of fact since 3 years the engineer students in the option innovation have all been inventors of a license thanks their collective project. This may be due to the innovate learning described here above in this article.

The main motivations of the students are based on passion, envy to create or their need of recognition. All the department's teachings "Quality, Innovation Reliability"

contribute to such positive results. The question is now how to sustain the financing of the patent deposit...

5 Conclusion

The integration of music, the zapping method and the introducing of videos help to capture the students' attention. We do observe they rapidly shut their laptops, switched off their mobile phone to listen to the course.

The proposed method allows to refocus the attention of students by listening to music, to increase the quality of attention and presence by zapping through videos and debriefing and thus to get a good quality of student learning. These students are actually learners rather than extras in a classroom.

The "Five I" make possible to explore inspiration, imagination, the different intelligences, recklessness, and at last intuition. Music and the rhythm of drums make the students' mental leash.

Students understand that innovation, creativity and intuition are multidimensional, linked together and dependent on their ability to let go the mental and to balance their mental, emotional and instinctive center.

They allow themselves to listen to the finest signals of their body to reach the "Vacuum auricular System" and to feel then their intuition. This workshop "Innovation, Creativity, Intuition" was experimented with engineer students in 5th year and in Master 2 of the ISTIA in Angers, students of "Arts et Métier Paristech" in Paris and in Angers too, students of the University of Cairo, students of the VUB University in Brussels, and also with students of the Business School of Hanoi in Vietnam. We are trying to train teachers in order to transmit those new teaching methods in France and in other countries.

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