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Thinking methods as a lever to develop collective intelligence

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ABSTRACT This publication describes a methodology and framework for the use of thinking methods as a lever to develop collective intelligence. The purpose of the described methodology and framework is to leverage in an optimal way thinking methods well-chosen to the decided purpose and objective of a specific task. The conscientious use of thinking methods allows individuals and teams to better deploy brainwork and “wire” individuals into a collective thinking process, increasing agility and quality of collective sensemaking and collective intelligence. This methodology can be taught in combination with teaching content like innovation models or marketing, with the objective that students acquire not only the content but also learn to implement it, using the most efficient thinking methods.

KEYWORDS Collective intelligence, creative thinking, critical thinking, thinking methods

1. PROBLEM FORMULATION

Our educational system is focussed on teaching content and analytical thinking. In competitive intelligence (CI), critical thinking was introduced, to avoid judgements based on cognitive bias and to assure the usage of a complete analytical grid.

But how can we lever our natural human intelligence into an agile collective intelligence? Based on the practice of thinking methods I propose a methodology in the format of a group learning process, to work and think together collectively. As a result, complex problem-solving or collective sensemaking become processes of a collective thinking network.

2. LITERATURE REVIEW

The focus is put on thinking as a process and thinking methods in the field of science and economy. The social aspect of the human being is approached from a neurological aspect. There are examples from the living arts: theatre, improvisation, and ancient martial art

traditions that are based on instant networked acting and thinking.

Collective thinking, collective sensemaking and collective intelligence result as networked thinking processes.

In 1968, a study conducted by Land and Jarman stated a strong decrease in the creative thinking score of children, that remains at a level of less than 2% for adults. The creative thinking score was 98% for 5-year-old children, 30% for 10-year-old children and 2% for ages 25 and older (Land, Jarman, 1968). Why is this so? Land and Jarman stated two kinds of thinking processes when it comes to creative thinking. These are divergent thinking, “where you imagine new ideas, original ones which are different from what has come before but which may be rough to start with, and which often happens subconsciously”, and convergent thinking “where you judge ideas, criticise them, refine them, combine them and improve them, all of which happens in your conscious thought”(Land, Jarman, 1968) and continues “[...] throughout school, we are teaching children to try and use both kinds of thinking

at the same time, which is impossible.”(Land, Jarman, 1968).

In the field of intelligence studies, Heuer pushes for a sound basic education in analytical thinking and decision making, especially in large organizations. The following two statements are considered key to understanding the need of thinking methods in our often too simplistic world:

1. “Pay more honor to doubt. [...] *We do not know. or There are several potential valid ways to assess this issue.* should be regarded as badges of sound analysis, not as dereliction of analytic duty.” (pp. XXV, Heuer, 1999)
2. “The mind is poorly *wired* to deal effectively with uncertainty (the natural fog surrounding complex, indeterminate intelligence issues) and induced uncertainty (the man-made fog fabricated by denial and deception operations).” (pp. XX, Heuer, 1999).

Heuer proposes to apply critical thinking for complex analysis in the field of intelligence. Statement one has been integrated into the complete curriculum of executive MBA studies at INSEAD. Nearly every course treats at least one business case with a complex setting, where the analysis shows that there’s not one solution, instead “it depends”. This is a very practical way to bring more reflection and analytic thinking into general management worldwide.

Statement two will be addressed later in this article.

Natural science philosophical essays from the mid-20th century document discussions showing how scientists proceeded to find ground-breaking theories. G. Holton cites a tentative of A. Einstein to describe how he’s proceeding when thinking scientifically: “Basically a cyclic process starting at the point where it should end. It is based on an axiom (one wishes to achieve), experiences lived through and deductions that allow to link the axiom with the experiences lived through.” (Holton, 2004). On the other hand, Einstein does not give any information on how the axiom came into his mind. This thinking process is what we call today expert intuition, which belongs to the creative thinking methods.

If we want to understand how the above-mentioned axioms emerge, we find an interesting answer in Gladwell, (2005). “Snap judgements and rapid cognition take place

behind a locked door.” Gladwell choose different personalities: a star tennis trainer, Vic Braden, who could predict that double faults would happen just before they happen, and the billionaire investor George Soros and his decision making “... the reason he changes his position on the market or whatever is because his back starts killing him. He literally goes into a spasm, and it’s this early warning sign.” (p. 51, Gladwell, 2005).

Interestingly Holton challenges analytical, scientific thinking, based on a specific focus group: scientists that were recognized by the scientific community via various prizes. He’s analyzing their deliberations about expert intuition in scientific research.

If we apply pattern analysis to Holton (2004), Heuer (1999) and Gladwell (2005) it stands out that all of them search credibility associating their work with personalities recognized by the community. Holton does this through internationally recognized scientists, Heuer through a second foreword and an introduction to his book written by different personalities recognized throughout the intelligence community, and Gladwell through VIPs.

Heuer’s approach to thinking is based on the conscious mind in order to do an analysis that is as objective and detailed as any possible and reducing the risk of errors based on cognitive bias or other rapid neurological mechanisms, that our brain can perform (Gladwell, 2006) (Eagleman, 2015). Critical thinking takes time, but allows us to develop in a structured workflow of the analysis of complex situations.

But what about situations that either need instant decision making (e.g. firefighters saving people from a burning building)? Or when one must decide in a complex and/or dynamically developing situation with very scarce information to make an overall picture of the situation? Here we find instruction through “presence of mind” (Duggan, 2010) a core skill taught in Asian traditions of martial arts including yoga, ai-ki-do, ken-do, and karate. Presence of mind can also be achieved through meditation techniques. Basically what happens is that we allow our brain to apply its, often extremely fast, mechanisms of pattern recognition and thin slicing. When “presence of mind” goes hand in hand with a strong expertise we talk about expert intuition. This expert intuition is what scientists can rely on when they’re developing new theories or discovering new natural phenomenons. In history we also have the military strategist von

Clausewitz who described “presence of mind” as a tool to prepare strategic fights and conquer other countries (Duggan, 2010). With neuroscience we can already localize where the diverse mechanisms are executed in the brain. We also have proof that training our brain allows “brain plasticity”, sometimes bridging neuronal connections that have, for example, been separated during an accident (pp. 184, Eagleman, 2015).

Our brains are large neuronal networks. And they are “[...] primed for social interaction. After all, our survival depends on quick assessments of who is friend and who is foe. We navigate the social world by judging other people’s intentions.” (pp.149, Eagleman, 2015). “Every moment of our lives, our brain circuitry decodes the emotions of others based on extremely subtle facial cues.” (p. 154, Eagleman, 2015). So this is where collective intelligence can emerge, or be trained.

3. METHODOLOGY

Thinking methods are not taught at school. They’re not part of the curriculum at university. Usually, if you run into a question, the answer is “you’ve got to think”. But who will tell you which kind of thinking works best for the question at hand? And in any competitive setting, the question of “friend or foe” is key. I developed a methodology to teach and train thinking methods and their application at work or in daily life. The methodology can be trained through real life complex case studies or it can be taught and trained together with content teaching, like innovation theory, marketing, or various other content subjects.

3.1 Introduction and setting

Thinking together is a social act. And it bears certain risks: the other will know you better and could use this knowledge against you. It is crucial that the participants or the team members, wishing to train following this method, have the possibility and mindset to accept the basic settings: openness, mutual respect, trust and discipline.

Without such setting, collective thinking cannot emerge.

Learning is always linked with emotions and other people. This is especially true when teaching thinking methods to an educated audience. Or in the words of Maria Montessori, 1870 – 1952, an Italian physician who developed a self-driven learning method for children:

“Education should no longer be most imparting of knowledge, but must take a new path, seeking the release of human potentialities.” (Montessori)

3.2 Individual awareness

Here the task for any participant is to become aware about what she or he really does, when she or he decides to think. And to listen and understand how each other participant proceeds, when she or he decides to think. As no thinking methods exist in the curriculum of schools and universities, we state that the differentiation between “experts” and “common people” to estimate a collective intelligence level, that we see in research about collective intelligence, doesn’t apply. Here we can state stronger differences depending on culture, gender or individual mindset. The methodology differentiates thinking methods used to understand, to find ideas, to analyze, to hypothesize, to decide. Astonishingly people rarely link thinking methods to objectives: when applying thinking methods for decision making, e.g. in a brainstorming process, or analyzing a case study using thinking methods from ideation, this is when we can be sure to have a poor outcome.

Participants are also questioned about the setting in which they search for specific thinking tasks, and while some people prefer to walk through the forest for inspiration and finding ideas, others do the same to analyze an important question. At the end of this step, participants have a more structured overview of how and when to apply their thinking methods, and they achieved a first overview over the thinking methods capacity in the group, including a first glance on how other participants think.

3.3 Collective awareness

The next step is to link thinking methods, so that the group can start to practice collective thinking. This can be done in sub-groups. The application of theatre methods to develop collective spontaneity can be efficient. What can be achieved here is an increase in the awareness level and live first aha-moments. During the collective awareness step a first timetable is introduced, describing the link between brain frequency and thinking methods that fit the brain frequency. It helps to note the hour of day a person estimates to be usually in this very brain frequency (e.g. just before falling asleep and when waking up the human

brain frequency is relatively low, which fosters the creative thinking capacity of the brain), and add which specific tasks from the daily life could be done best with a specific thinking method, i.e. at a specific brain frequency.

3.4 Enrich

The role of this step is to turn from awareness into active practitioner. These can be individual practitioners and collective practitioners of thinking methods and collective thinking. Social neuroscience brings first results and support to understand this step:

“Half of us are other people. [...] Brains have traditionally been studied in isolation, but that approach overlooks the fact that an enormous amount of brain circuitry has to do with our brains. We are deeply social creatures. [...] our societies are built on layers of complex social interactions. [...] All of this social glue is generated by specific circuitry in the brain: sprawling networks that monitor other people, communicate with them, feel their pain, judge their intentions, and read their emotions. Our social skills are deeply rooted in our neural circuitry.” (p.147, Eagleman, 2015).

In the setting of this methodology, based on trust, mutual respect and a win-win collaboration mindset, it becomes possible to develop social dynamics inside the learning collective. It can be measured through an

increasing creativity of the participants as individuals and in (sub-)groups.

3.5 New

At this point the manual of thinking methods, with a large collection of thinking methods, comes into action. The learning process follows the demand of the participants, as it is a creative learning process. As mentioned by (Adriansen, 2010), the teaching concept is better not directly result-oriented, but gives room for unexpected requests of participants.

3.6 Apply

The objective is to apply all thinking methods learned, on individual and on group projects. Participants frequently change roles: they ask advice or thinking support from the group for a personal project or question, they become part of the co-thinking group for another project, or they facilitate for a project to choose thinking methods and settings to find ideas, answers, or understanding.

When teaching a group of people over a longer time, it becomes useful to include theatre methods, like automatic answering or improvisation theatre, to train their spontaneity. This is only possible once the members of the group have achieved a sufficient level of mutual trust, feeling safe in the group learning process. Let's take the example of improvisation theatre or automatic answering. People interact extremely fast, so their brain will use its repertoire of thin slicing, cognitive bias, implicit association, and so on.

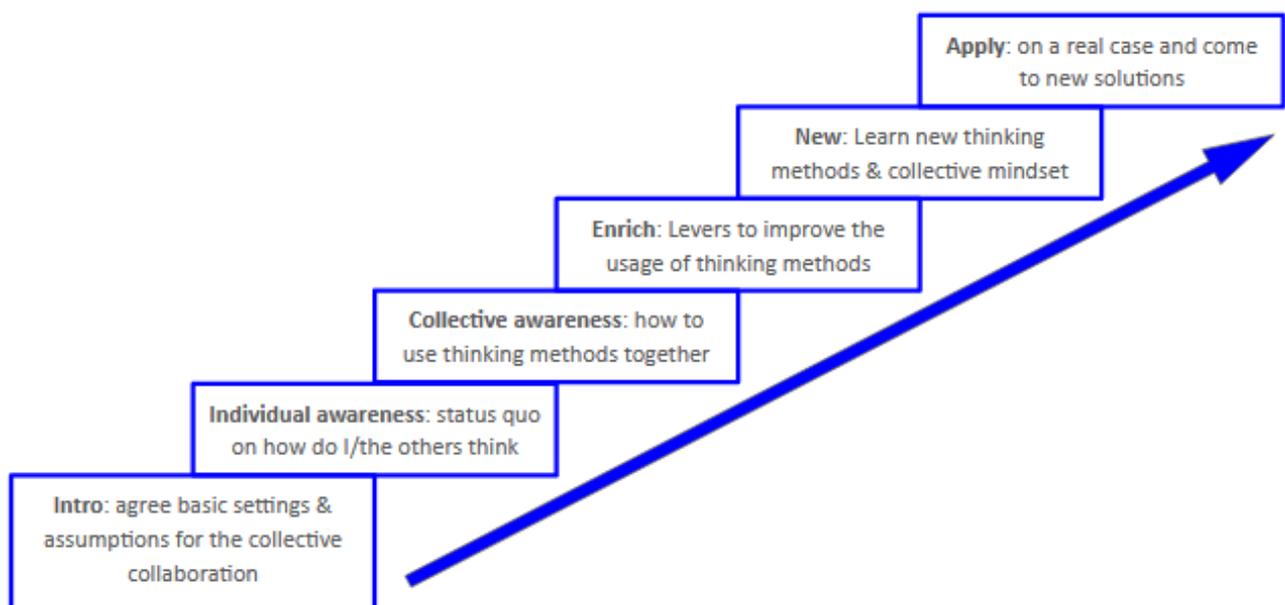


Figure 1 The methodology: a learning process.

“The Structure of Spontaneity [...] Improvisation comedy is a wonderful example of the kind of thinking that Blink is about. It involves people making very sophisticated decisions on the spur of the moment, without the benefit of any kind of script or plot.” (pp.111, Gladwell, 2005).

Again, we’re learning from creating awareness of our own biases. Starting from the awareness we can go further.

Training spontaneity will also include decisions to act under the influence of, for example, cognitive bias or implicit association. We are creating awareness. Once people are aware of their biases, they have a chance to attack change.

4. METHODOLOGY APPLICATION

The described methodology has been developed and tested during 4 years lecturing in innovation leadership and marketing classes of 33h lecturing time, to master-II students at Sorbonne University. Also, it has been developed and tested during 5 years of lecturing at a one-day workshop in Critical Thinking and Creative Problem Solving at the Institute for Competitive Intelligence. Both formats are very different in lecturing time and audience. It gave me the opportunity to optimize the learning outcome of thinking methods in a compact format and to achieve a certain degree of an active collective intelligence behaviour in the master-II lecture.

4.1 The case of teaching critical thinking and creative problem solving to CI professionals

A one-day workshop is very short to get participants accustomed to new learning and thinking methods. Still it is a great opportunity to start from an actual, complex problem of the participants and develop during the day step-by-step solutions, applying different thinking methods, leveraging individual and group thinking methods.

“People interpret information individually and then collectively. Collective learning is important. Understanding weak signals advances by trial and error, or ‘learning by doing’.” (de Almeida Lesca, 2019)

Thinking methods are a strong lever to increase the quality of collective sensemaking and the agility of collective intelligence. Further research is under preparation.

4.2 Application of methodology: the case of foresight and long-term strategy development

Industries with a strong R&D tradition have the chance of a huge intangible asset in their experts’ knowledge. Still it can be difficult to access the knowledge and include it into estimations of the future and strategy development. The methodology uses different thinking and group thinking tools to access expert intuition, to visualize it and use it for a long-term strategy proposal. This method allows one to strip-off various cognitive biases and taboos. In order to propose it as a regular tool for strategy development, further test series have to be conducted.

4.3 Application of methodology: the case of teaching innovation & entrepreneurship

As stated by Adriansen “With critical thinking being among the core values in higher education, can we then also foster creative thinking?” (p.1, Adriansen, 2010). The presented methodology seeks to teach students in-depth expertise using innovative learning and thinking methods to link this very expertise to the active knowledge and daily life of each student.

Teaching both innovation theory and thinking methods, using various example business cases, invites students to link expertise and sources of knowledge around them, proceeding them following the various thinking methods so as to find new solutions. Giving them the possibility to choose the topics of the practical exercises from their real life is a strong motivator. In addition, theatre methods support the learning of communication skills, spontaneity, savoir-être and growth mindset. During the four years of teaching, the main objective was to make students become active innovators, and this has been achieved. As a collective, but also as individuals, their capacity was developed to detect and leverage entrepreneurial opportunities from their daily life and professional environment through thinking methods and individual and collective sensemaking to find hands-on solutions.

Key insights from these lectures are that:

- At university (as in many similar settings) students arrive in a passive-student-consumer-mindset. Interactive and hands-on teaching sequences showed very positive results.

- First exercises in creative thinking and other thinking methods help to defocus, to find a key that can change the maze, and show positive results. All students start to link novel solutions to real problems from their personal experience, to analyze and improve them through the innovation theories and analytical tools provided during the course.
- The more the course advances the more the students collaborate, think together and support each other to succeed. The course ended with a class that elaborated two team and individual projects per person, and a very agile collective sensemaking and collective intelligence activity.

4.4 Application of methodology: some examples of missing thinking methods

In a few examples we show how neglecting the use of thinking methods in brainstorming or decision-making processes can lead to inefficiencies that could be avoided, by simply applying thinking methods purposefully.

4.4.1 Example time management versus improbable innovation ideas

One important aspect of management training is time management. Still sometimes it may make sense to check the compatibility with the objectives. Let's take the example of a very innovative technology development company. Every Monday from 9am till 10am the list of ideas for the innovation management is evaluated. These ideas would need the deciding managers to be in a calm, low brain-frequency mode, to be capable to conduct divergent, creative thinking, to understand the possible value in each idea. This is rarely the case at 9am, as people are still in the morning rush to get things done. So these managers meet to decide which ideas to keep, which ideas to stop - still decision making needs another way of thinking other than creative thinking. How probable is it that they will keep an idea with the potential of disruptive innovation? Here a simple check of the settings and the choice of the best thinking method would give the company higher chances to surprise through innovativeness in the future.

4.4.2 Example brainstorming with concise summary of the proposed idea

Brainstorming means bringing as many ideas and as diverse as possible ideas together. As already stated above in Land (1968), it is not possible to do divergent thinking and convergent thinking at the same time. These are two opposite thinking methods. If they're separated in time, the summaries can be done without problem after the divergent creative thinking brainstorming has finished.

4.4.3 Example: diamond with a proper diverging ideation phase, then converging to a set of chosen solutions

When working with the diamond, we start with a phase of divergence, finding as many possible or impossible ideas, proposals, settings, dreams, and images. The difficulty is to stay strictly in the divergence phase and stick to creative thinking, which means a low brain-frequency mode of all participants. This could be during a one-day workshop. It could run from 8h till 10h the phase of divergence, then half an hour coffee break, to converge to a set of chosen solutions by noon. Let's assume that all participants aren't morning people. We have good chances that our team stays in a calm creative thinking mode between 8h and 9h. But as soon as the pressure to deliver a set of "realistic" solutions by noon comes to mind, the end of the divergence phase will turn into a converging phase, as it becomes tempting to swap to analytical reasoning. Participants will focus on which idea will get a vote, for example from the general management. Then, the quantity and diversity of the idea phase is narrowed down, due to switching from creative thinking to analytical thinking and decision making.

If our team is very disciplined they'll stick with critical thinking. But the funnel wasn't filled to the optimal extent.

Probably it would have been advantageous for each member of the team to take home a writing pad, take note of ideas before falling asleep in the evening and when waking up in the morning and to send them in a voice message when commuting to work. Alternatively, if team dynamics are wanted, the session could start after lunch, when all team members are a bit tired, their brains are in low brain-frequency mode, and they have time to think together calmly with the

converging phase being planned the next day during morning hours. This is the best time for our brains to do critical thinking and decide through a thorough analysis.

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