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MINDFUL TRIZ

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Abstract: *We see countries like China, Korea and Iran deploying TRIZ thinking widely among their engineering and scientific communities. When many people use TRIZ, the disadvantages for the non-user increase, while the advantages for an individual user are reduced. TRIZ users, therefore, increasingly need to find ways to increase the effectiveness of their TRIZ-related activities. It is becoming time to consider the psychological aspects associated with getting the best out of TRIZ. When two TRIZ teams find themselves in competition with one another, it is our hypothesis that perhaps it now becomes the one with the better mental state that is more likely to emerge as the victor.*

The paper seeks to begin the process of exploring the connection of advanced mental techniques and TRIZ. Both fields have a wide range of tools and methods. It seems that both fields can be brought easily together and thus allow innovators and teams to reach a higher ability to reveal the 'right' problem, to generate a broader range of stronger ideas. As a consequence, better solutions should be found in a shorter period of time. By bringing methods from Systematic Innovation and mindfulness together and by implementing that into workshop sessions, the paper demonstrates some of the early tangible benefits. From all workshops it can be seen that mindful TRIZ can play a significant advantage through the process of solving problems and for the next TRIZ generation.

The aim of that paper is to show the TRIZ society how mindful TRIZ can enhance the process of solving problems and how to continue to be one step ahead. It is our desire to begin the journey by constructing some solid foundations. Something we believe is especially important and given the new pandemic-Crisis dominated world in which we all now live.

Key words: *Mindfulness, flow, divergence-convergence, complexity, Systematic Innovation, TRIZ, mindful TRIZ, high performance, success, sustainability, future methods, victory, neuroplasticity, cognition.*

1. IDEA OF CONNECTING MINDFULNESS AND TRIZ

Great athletes, we can now all see, need to be much more than just technically proficient athletes. Similarly, great musicians need to be more than just technically proficient masters of their instruments. The mental state is known to play as an even more important role as the physical does. For this reason, nowadays it is uncommon to see a top athlete (e. g. Gottwald 2010; Strasser 2018) or musician not having a psychologist or 'mindset coach'. From a TRIZ perspective, what we see here is a classic 'someone, somewhere already solved your problem' situation: A group of elite individuals

with an extreme situation – the need to generate an extra critical millisecond advantage over others, or to create sounds that make them to stand out from a million other musicians – now, that may have something to contribute in other domains. Specifically, how does one innovator stand out from another?

It is perhaps the case that, because the use of TRIZ is still not the norm, any innovator deploying the tools, methods and philosophy of TRIZ and 'Systematic Innovation', TRIZ-utilizing innovators already carry a significant advantage over the majority. But now, as we see countries like China, Korea and Iran deploying TRIZ thinking widely among their engineers, it is becoming time to consider the psychological

aspects associated with getting the best out of TRIZ. When two TRIZ teams find themselves in competition with one another, perhaps it now becomes the one with the better mental state that is more likely to emerge as the victor?

If we look at Altshuller's publications, there is a significant piece of evidence of demonstrating that he was seeing the same needs. His last book, 'How to Become a Genius: Life Strategy for a Creative Personality' was in effect all about the psychology of extremely successful inventors. Regarding that he was not so different from equivalents in other fields. In the fading world of Neuro-Linguistic Program, for example, the entire requirement of the research of founders, John Grinder and Richard Bandler, was to study the psychology of extreme thinkers like Da Vinci, Mozart, Tesla, Disney and Einstein. Altshuller's attempt is now largely considered to be a failure; whereas Bandler's fade from glory has more likely come about as the result of simplifying corruptions of his findings too, in effect, turns NLP into a method by which the minds of others can be manipulated for less than ethical reasons. The failure of both, we now see thanks to the pioneering work of sports scientists and musical mentors, was a failure to understand human psychological matters from a first principle level.

By studying analyses of genius-level thinkers - "How to think like Leonardo da Vinci" (Gelb

2000) and equivalent books (Matchett et al 1994) – it can be seen that, like high performance athletes or musicians, 'geniuses' go far beyond mere subject-matter proficiency. The question is how can we reach high performance and reach the best outcome of the innovation process while we use TRIZ or Systematic Innovation?

The 2020 corona virus pandemic has added an extra level of urgency to this question. The last decades of the 20th century and the first two of the 21st century were mostly shaped by a growing economy. But after over 40 years of 'continuous improvement' activities, nearly every industry has today found itself plateaued at the top of an S-curve. The only way forward when enterprises find themselves at the fundamental limits dictated by the S-curve, is to make a discontinuous jump to a new – and hopefully better – way of doing things. For the last five years, many industries have found themselves stalled with almost no large organization willing to be the first to make the jump. The pandemic has, whether these organizations are ready or not, pushed everyone off their current S-curve. As such, the next few years look set to be a critical period for innovation. We can say this with some confidence thanks to the well-known 'Disaster Cycle':

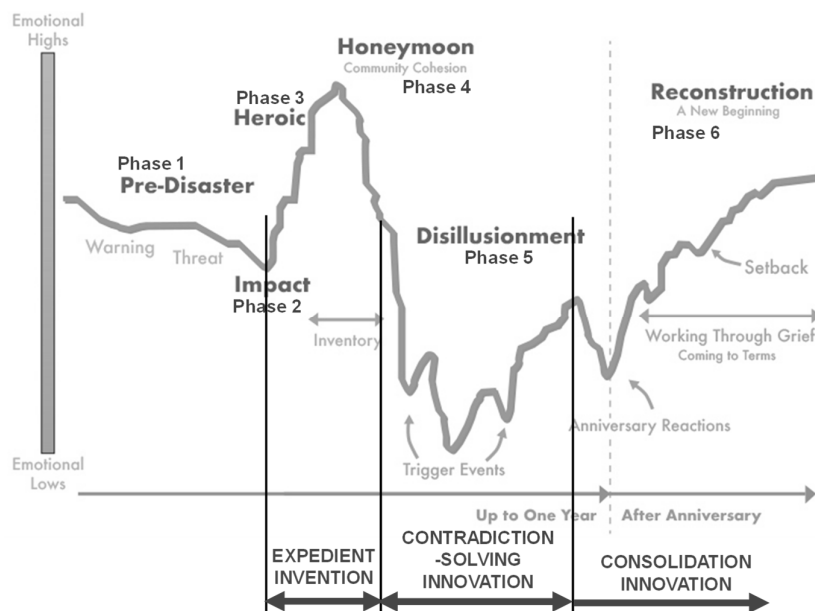


Fig. 1. Disaster Cycle

Innovation, the TRIZ research tells us, is largely about contradiction solving. The corona virus pandemic triggered Phase 2 of the Disaster Cycle. During the months of March, April and May 2020, the world has seen the Heroic and Honeymoon periods: a time where lots of expedient invention takes place (healthcare workers improvising PPE equipment, for example, when supplies proved inadequate). Importantly, however, invention is not the same as innovation. It is sometimes necessary to improvise making PPE out of bin-bags in the short term, but later – during the Disillusionment phase – the shortfalls of these expedient solutions open the way for true innovation. Importantly, this Disillusionment window of opportunity is very finite (we estimate it will last 3-5 years) and consequently, there is an imperative to innovate more rapidly and efficiently than has traditionally been the case.

In general, it means that almost all society and economically behaviors have already changed or are now on the cusp of change. It seems likely that, as the pandemic triggers other economic crises, there will be more changes taking place as each falling economic domino helps to knock down other dominoes. This affects not only all innovators and the TRIZ world but also mindfulness as a subject in its own right. Most people have used mindfulness to reduce their level of stress. It still will play a significant role to reduce stress, but, post-pandemic, also anger and anxiety borne of the much higher levels of economic chaos and uncertainty. Mindfulness will also support people on a personal level – to find their personal goals, helps them to focus on the live in the here and now. In the business context this will mean that, by becoming less stressed, people are better able to free their mind and thus concentrate more effectively on their jobs and proactively rethinking a more ideal future.

2. WHAT IS MINDFULNESS?

Mindfulness is a practice involved in various religious and secular traditions – from Hinduism and Buddhism to yoga and, more recently, non-religious meditation. People have been practicing mindfulness for thousands of years,

whether on its own or as part of a larger tradition. In general, mindfulness stands for deceleration on a daily basis, to reduce stress, to increase self-insurance and it is just to bring more addition into the current moment (Holdau 2019).

As such, despite the fact that the word ‘mindfulness’ has only entered the popular lexicon in the last decade, there is a high degree of confusion surrounding what it actually is. Recognizing that the most likely reader of this paper is a person that knows TRIZ but probably doesn’t know too much about mindfulness, we propose here three definitions that attempt to explain its main concepts in terms of the shift of mindset. Mindfulness, in other words, can be thought of as the outcome achieved following the successful resolution of a number of contradictions.

First, mindfulness may be equated to ‘unconscious competence’. For instance, jazz drummer, Buddy Rich, famously said, ‘when you think, you stink’. As one of the world’s most renowned drummers, he possessed an incredibly high level of technical competence. His ‘stinks’ statement is all about the need, once competence has been achieved, to switch off the conscious brain and let ‘instinct’ take over. Unconscious competence from the athlete’s perspective is all about achieving a state of unity between the physical and the mental. This unity is often referred to as ‘flow’ (Csikszentmihalyi 2019). ‘Flow’ describes the ‘timelessness’ that athletes and musicians often talk about while they are experiencing the flow state.

Second, the word ‘duende’ originates with flamenco dancing and refers to the same oneness of the mental and the physical when a dancer achieves the ‘mindfulness’ state. Musician, Miles Davis also co-opted the ‘duende’ term in what many consider one of his golden periods of playing and improvised composition (Kraounakis 2018). He used it to describe the simultaneous attainment of ‘soul’ and ‘inspiration’.

Third, in a similar vein, we might also look at mindfulness when it comes to contradiction-resolution. This time focus on the anatomy of the human brain. The brain is an extraordinarily adaptable entity, possessing enormous plasticity, such that if one part of the brain becomes

damaged, other parts are able to adapt to take on the roles and functions lost as a result of the damage. That plasticity aside, at the risk of offending some psychologists, it is also the case that an undamaged brain allocates certain functions to specific regions of the brain.

From a mindfulness perspective, in this regard, we can talk about left and right brain contradictions and also, less well-known ‘front’ and ‘rear’ brain and lower/upper distinctions. ‘Mindfulness’ might be defined as the state in which both our (analytical) left-brain and our (synthesizing) right-brain are engaged (laterality), or, when both our (equilibrium-seeking) rear-brain and (learning) front-brain are simultaneously engaged (focusing).

Or our upper- and lower-brain (centralization) are also working together in harmony. Under normal (non-flow) conditions, we are typically using one or other half of our brain – i.e. either we are rationalizing or pattern-forming, equilibrium-seeking or learning.

Or, worse, we’re not using our brain at all – i.e. the zombie-like state created by many of the world’s jobs. The fact that 75% of employees are either dis-engaged or actively dis-engaged from their work is probably telling.

One would hope that people would rebel against this state – maybe the current crisis period will help? In the meantime, we know from ‘The Midnight Disease: The Drive to Write, Writer’s Block, and the Creative Mind (Flaherty 2005) that the front/rear balance determines our creative drive.

By defining ‘mindfulness’ we might also add an additional thought: A thought that says if we know how good our mental state is, at any given moment that knowledge enables us to become mindful about ourselves.

The idea here is, only when we know where we are that we become able to establish what needs to be done in order to reach a higher mental state. And to find out what has to be done in order to be more mindful (Eder 2019).

This distinction between being mindful of where we are and achieving the state of mindfulness or higher mindful state is important as we now move forward to explore some of the links between mindfulness and the effective use of TRIZ.

3. HOW MINDFULNESS AND TRIZ METHODS CAN BE LINKED

As it can be seen from the first two parts of the paper, the authors have tried to demonstrate the connection of mental techniques and the TRIZ world. Both fields have a wide range of methods (Dornieden 2003; Mann 2014). It seems that both fields can be brought easily together and that mindfulness enhances the innovation process in a measurably positive way. It allows innovators and teams to reach and evaluate a high rang of ideas and solutions on different perceptual levels of attention. Innovators and teams can work even more focused and concentrate better on the original problem with mindful TRIZ. As a result, they simply are reaching the best outcome in even a shorter period of time. Hereafter, the connection of mindfulness methods and Systematic Innovation tools are described.

3.1 Outcome Mapping

Outcome Mapping can be connected with Autogenous Training. Both methods are focusing on the current situation even if there are different points of views. While the Outcome Mapping forces users to focus on tangible and intangible fields either of your company, the customer or the society – Autogenous Training helps to focus on your own body. Often innovators or innovation teams struggle by finding the right tangible and of course even more with the intangibles of the society. The aim of the connection of those methods is to solve that problem.

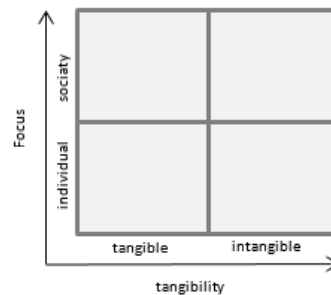


Fig. 2. Outcome Mapping

Autogenous Training allows bringing the full attention into the current situation in your body

(Grasberger 2002). Then it is necessary to transfer that high level of mindfulness onto the question: ‘What are the intangibles of the society?’ Through the high level of concentration in your own body it is possible to put yourself in somebody’s shoes – in that case into the thoughts of the society.

In short, the main process of the application is following – ideally, an instructor will guide you through that process, if you are not used to these methods: First, the innovator or the team will get into a high level of attention by one of the basic exercise of Autogenous Training. With that high level of attention the innovator or the team moves on to the customer’s view. The important point is now to bring that high level of attention into the customer’s perspective and later on to the level of society mind set. Overall, it can be said that these methods help to put himself/herself into the customer’s view to see the bigger picture. Crucially, what should also be noticed here is the importance of recognizing that our brain is fundamentally connected to our physical body as a system. Assuming that we can solve a wicked problem while sitting at a desk for long enough fails to recognize the importance of the links between the mental and physical. If you’ve ever experienced the unstoppable urge to stand-up and walk around during those moments where you’ve just had or feel like you’re on the verge of – a breakthrough insight, that’s your body trying to remind you of the innate mental-physical connections. If we consciously sought to acknowledge the connections – as Autogenous training teaches – we increase the likelihood of those insights from both happening at all, and/or happening sooner and more reliably.

3.2 IFR Mapping

Ideal Final Result (IFR) can be well connected with the Visualization - guided imagery program. Often, innovators or teams have difficulties to imagine the IFR even if the team discuss different solutions and try to find clear definitions. A guided imagery program is a great help if the team is open-minded and willing to try it.

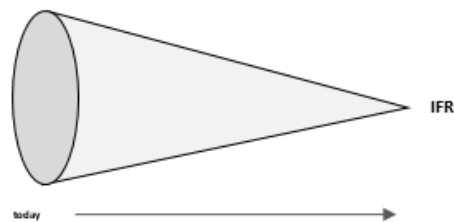


Fig. 3. IFR Mapping

In the first step, the Ideal Final Result has to be formulated for the target future point. All logical steps of development from the today’s components need to be recorded. Also some components might drop out on the way to the IFR. After having fulfilled the IFR as usual, the visualization can be started. The authors call that process step: Mindful Product Visualization. That means that the innovator or the whole team will be guided from the instructor/innovation trainer through the visualization. The picture of the IFR will be visualized in the defined future environment by using the power of imagination. Either it can simple be done by visualizing the product, the solution or the service in the future or the whole processes could be visualized.

These methods allow you to see the bigger picture. It widens your horizon and helps to see new ways or opportunities. That might be helpful to reach the IFR and to challenge the planed IFR, for example with following questions: Is the IFR the right one? Is the IFR realistic? Are there other, better IFR? Also, as a result of that process, the team will be strongly connected with the picture of the IFR and higher motivated by working on the IFR.

3.3 Law of System Completeness

The Law of System Completeness can be connected with the Body Scan. Both methods aim to focus on the whole system. Even if they have different targets, they can be easily connected. While the Law aims to see what is missing or where or what can be changed or added to the system – the Body Scan allows to bring the full attention to your own body system. Sometimes innovators or teams have difficulties to find the best part to innovate. Exactly at that part helps the connection of these methods.

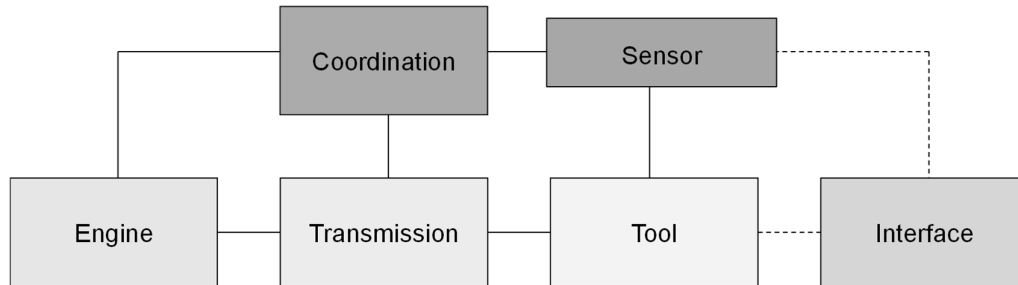


Fig. 4. Low of System Completeness

In short, the main process of the application is following: First, the Law of System Completeness has to be filled in for your system. Then, the innovator or the team starts with the Body Scan, e.g. focusing on the arms. Ideally, an instructor will guide you through that process. Then, they move on through the whole body. By the end of the process a higher and sensible attention can be reached.

That method allows you to bring the full attention into the current situation in your body. Then it is necessary to transfer that high level of mindfulness onto the System which you have chosen for the Low of Completeness. Following question has to be answered: ‘Where can I innovate?’

The high level of concentration in your own body helps to put yourself in somebody’s shoes and to see the problem from other perspectives. So that builds a good base to go into the system of Low of Completeness.

3.4 Contradiction Mapping

Contradiction Mapping can be linked with Cognitive Methods e.g. Brainkinetik. Contradiction Mapping is used in different ways during the innovation process – solving contradictions is a key element of the success of Systematic Innovation. So, overcoming barriers are quite close in connection with that crucial method. It becomes clear that this could occur during any innovation process – it doesn’t make a difference if it deals with a product, service or process innovation even with organizational development processes. Teams should be heterogeneous in order to bring different views into the problem solving process. However, that might not help in all situations.

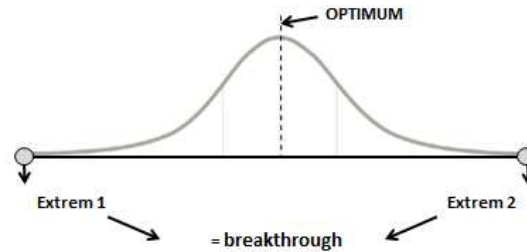


Fig. 5. Explanation Breakthrough

Special Cognitive Exercises e.g. Brainkinetik encourage our neuroplasticity and help to build up new nervous connections in order to grow and develop new ways and behaviors (Rossmann et al 2014). Also, it helps to reduce stress by decreasing the size of the amygdala. By adopting regular Cognitive Exercises practitioners are getting more stress-resistant and it allows to reach a sharpened, finely tuned perspective.

By bringing the process of problem solving and Cognitive Methods together, it can be seen that the output can be different if those methods are in practical use over a longer period of time. Overall, it refreshes and opens the mind so that other perspectives, other ways of thinking and new possibilities can occur. And, that not only helps to solve contradictions, it also helps during the process of setting and implementing new things related to organizational development such as setting and implementing companies values or companies vision.

3.5 Product Life Cycle

PLC (Product Life Cycle) or the S-Curve Analysis can be merged with life style management. Seeing the connection may prove to be the most challenging part of the process, but also the most important one.

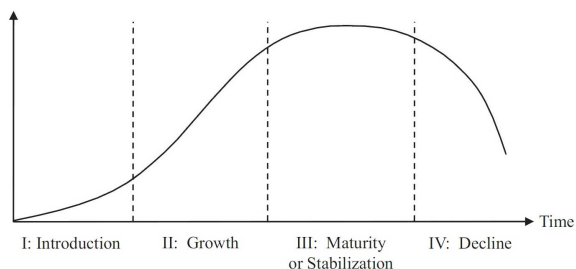


Fig. 6. Product Life Cycle

The literature mostly divides the product life cycle into four main parts (introduction, growth, maturity and decline). In the past and also in the future, there were and will always be ups and downs, tension and tension releases during the process. It has to become clear that without relaxation or some breaks, a high level of performance over a long period of time will not be possible. Not for managers and not for athletics and also not for products and services. From the past, and the current situation, you might have become aware of negative examples. It might be a good time to rethink processes, bring tension releases into the picture in order to reach sustainable products and services. That also applies for the personal life style.

These days, there are many different life style and health management concepts available. The authors summarized the important parts of health management in a simple way. All parts are important in order to reach a well-being life style. Health management can be summed up with the following parts:



Fig. 7. Health Management

Sometimes people are open to new ideas, and therefore changes. At other times, it might be more difficult to implement new things. That applies also to companies. All managers, all practitioners who have implemented new ideas, have worked with changes – it doesn't matter on which level or branch/industry you are in – knows that there is always resistance and it is always a challenge. But, there is always a way. Related to the current crisis, everybody and

every company need to be open. And it is so important to see the current situation as an opportunity. Every crisis includes a 'clearing' process either on a single point, on some processes, products or services or maybe the whole organization. By focusing on the PLC it is worth to discuss Life Style Management. Where are similarities and what needs to be adopted? Muster the courage yourself and for your company to start now, to innovate and to make changes happen. Be one of the top companies who has the desire and be one step ahead.

4. ENCOURAGEMENT OF THE TRIZ PROCESS THROUGH MINDFULNESS METHODS IN PRACTICE

Nowadays, mindful TRIZ seems to be a new area for practitioners. However, it has to be said that mindfulness methods are successfully used in so many areas e.g. sports, music, but also in the economy (e.g. like big organizations such as Google or Apple). So, both methods are fundamental and well-known. All described methods in the previous chapter have been proven. The following chapter highlights some relevant experience of the implementation and running of mindful TRIZ in innovation workshops.

After so many years of working with Systematic Innovation, there is still a big number of companies who have never heard of TRIZ or SI, let alone of the method implementation. But, after a short period of time, first successes can be achieved and teams are becoming more open-minded. However, with the encouragement of mindful methods such steps and successes can be reached even faster, by working on a high level of concentration right from the beginning. Therefore, the starts of workshops are not an introduction of participants, the opening for examples is a five minute mindfulness session, to bring everybody's attention to the topic. Having said this, it becomes clear that there is no room for laptop, tablets, phones, etc. this also allows the full attention to fall on the trainer. When it comes to creating new ideas, teams tend to use brain storming. From our point of view, a good way to encourage this process is to add movement. The simplest way is by using brain

writing, where teams are moving from one assignment to the next, adding their input to the question.

Through physical movement different perspectives can be added and new, creative ideas can arise by discussing different points of view in smaller groups. If we go one step further, it can be recommend implementing Brainkinetik or activation exercises or group dynamics.

At that point it has to be mentioned that this process of implementation is really helpful to reduce the stress-level and to be stress-resistant, however, it is important to work on that process over a longer period of time (at least an 8 weeks program can be recommended in order to learn new processes and to see changes).

Another well-known method is visualization. That works really well for all kind of processes which are related to future perspectives and all methods when focus on a bigger picture. Therefore, it has been connected with the Ideal Final Result. At that point it is important to note, once again, that it is crucial that the team members are open-minded and at least willing to try the methods.

A trainer who guides the imagery program is a great help for a team if they are not used to applying the methods. Through that program it is possible to create new ideas and to assess ideas on a different level of perception.

Also it is important to mention that there needs to be enough space for the exercises and to create a rephrase room where the session will take place in a positive atmosphere.

All methods and tool have to be considered and selected specifically for the actual problem or topic which you are planning to work on.

5. CONCLUSIONS AND FUTURE WORK

After describing how methods from Systematic Innovation and mindfulness can be brought together and by giving a brief overview of how mindful TRIZ can be implemented into innovation workshops, it becomes apparent that there is a high potential.

As we know, advantages can often be seen when people have taken a chance and being open to try something. The same applies to mindful TRIZ. Until now, there hasn't been any negative feedback from participants after running

innovation workshops with Systematic Innovation and mindfulness methods. Most people wish they would have started earlier and are aware of how physical and mindful exercises can be a value in the innovation process (also see Weintraub 1998).

Therefore, the main problem lies in reaching the customers. Isn't it such a typical situation that we are not willing to move from our comfort zone? And has the stain and crises always to be big enough in order to make changes?

We guess it might be the right time now, what are you waiting for? It lies in your hands to reach the best outcome and the best solution for problems and to create a sustainable future for our children's children and generations ahead.

If nothing else, the 2020 pandemic has forced everyone out of their comfort zones.

Hopefully, now in the new world, we will find answers being more open for 'the new green deal' (Klein 2019). The old world is never coming back for most sectors of society. Difficult times, however, always create winners and losers.

We know from previous Crisis Periods that the innovators tend to be in the 'winner's category. In that context, it is our belief that combining mindfulness and TRIZ offers an opportunity to maximize that possibility.

At least, it is our desire to begin the journey and to begin by grounding it in solid foundations.

The difference between a technically competent high-jumper and a mindful jumper may be measured in millimeters of difference in the height of the bar they are able to jump over. Mindful is similarly about turning a competent TRIZ user into one that is capable of persisting long enough to solve one more contradiction, or to combine one more idea into the final solution. This, of course, demands as a first step that people have attained a sufficient degree of proficiency in using TRIZ.

And then, adding mindfulness to their suite of capabilities. And so, we find ourselves back in contradiction territory.

Mindful TRIZ is about achieving parallel competence in TRIZ and Mindfulness techniques:

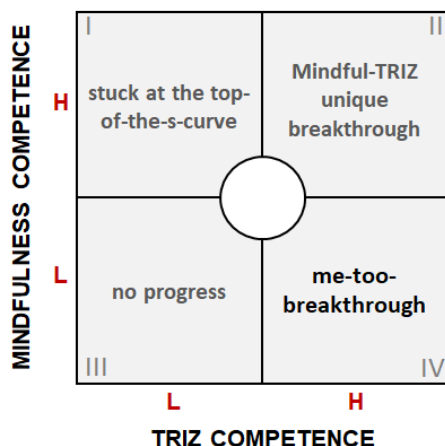


Fig. 8. Level of TRIZ-Mindfulness Competence

Something that works as a final thought both ways. The world needs better problem solvers right now, and adding mindfulness techniques to TRIZ, we propose, is an effective way of getting there. At the same time, already mindful athletes should not avoid venturing into the TRIZ world. Every high-jumper that enters the arena has practiced and practiced to get themselves into their mindful ‘flow’ state as they begin their run up to the bar. And yet the men’s high jump world record has not changed since 1993. The women’s record has not shifted since 1987. Being mindful, as 21st Century jumpers have amply demonstrated, is not enough. If the world record is to be beaten, they now need to contemplate adding TRIZ to their tool kits and methods.

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TRIZ conștient

Abstract: Vedem țări precum China, Coreea și Iran care implementează gândirea TRIZ la scară largă în rândul comunităților lor științifice și de inginerie. Când multe persoane folosesc TRIZ, dezavantajele pentru non-utilizatori cresc, în timp ce avantajele pentru un utilizator individual scad/sunt reduse. Prin urmare, utilizatorii TRIZ trebuie să găsească din ce în ce mai multe modalități

de a crește eficacitatea activităților lor legate de TRIZ. Este timpul să luăm în considerare aspectele psihologice asociate cu obținerea celor mai bune rezultate din folosirea TRIZ. Ipoteza noastră este că atunci când două echipe TRIZ se găsesc în competiție directă, cel mai probabil echipa cu o stare mentală mai bună va ieși învingătoare.

Lucrarea urmărește să înceapă procesul de explorare a conexiunii dintre tehnici mentale avansate și TRIZ. Ambele domenii dețin o gamă largă de instrumente și metode. Se pare că ambele domenii pot fi reunite cu ușurință și astfel permit inovatorilor și echipelor să atingă o capacitate mai mare de a dezvălui problema “corectă”, pentru a genera o gamă mai largă de idei mai puternice. În consecință, ar trebui să fie găsite soluții mai bune într-o perioadă mai scurtă de timp. Reunind metode din inovația sistemică și înțelegere și prin implementarea acestora în sesiuni de ateliere, lucrarea demonstrează unele dintre primele beneficii tangibile. În urma workshop-urilor se poate observa că TRIZ-ul conștient poate fi un avantaj semnificativ prin procesul de rezolvare a problemelor și pentru următoarea generație TRIZ.

Scopul acestei lucrări este de a arăta societății TRIZ cum TRIZ conștient poate îmbunătăți procesul de rezolvare a problemelor și cum poate continua să fie cu un pas înaintea tuturor. Dorința noastră este să începem călătoria construind niște temelii solide. Ceea ce este ceva despre care credem că este deosebit de important și având în vedere noua lume dominată de criza pandemică în care trăim acum cu toții.

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