

Why Leadership Falters in Critical Moments: Emotions and the Impact on Cognitive Abilities

Valsala Krishnan

Globetrotter Consultancy Sdn Bhd, Kuala Lumpur, Malaysia
Faculty of Business, International University of Malaya-Wales, Kuala Lumpur, Malaysia
valsala@globetrotterconsultancy.com

ABSTRACT

This study looks at the impact of emotions on the cognitive ability of the leader to manage himself/herself under stress. The findings show that emotions have a notable impact on the cognitive performance of an individual. Further findings reveal that physical senses; what you see, hear, feel, taste and smell; are strong triggers in activating emotions. When emotions are triggered, cognitive ability is disabled and an automatic knee-jerk reaction occurs from the individual's subconscious programming; based on the individual's perception and belief system that surrounds the incident or event. The study also indicates subconscious programming; i.e. beliefs and perceptions come from repeated past experiences, types of movies watched, songs listened to or books read. This research will shed light on why leaders can't practice the learnings from leadership and management courses, especially under stress. The ability to manage emotions determines whether the manager goes into an automatic reaction, where cognitive abilities are shut down and the manager acts out from his/her subconscious programming or the cognitive ability kicks in, and the manager can access and apply the newly learned information, eventually creating new habit patterns, resulting in the application of the knowledge learned. Further, this paper presents a methodical approach to managing emotions called SIEP; abbreviated for Spirit, Intellect, Emotions and Physical Senses; the conceptual model and its effectiveness in managing emotions, amongst entrepreneurs in a social business incubator, called ET Ideas in Malaysia.

Keywords: emotions, application of theory, learning, leadership, people management, subconscious programming, cognitive, thinking, organizational behaviour

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1. Introduction

This research focuses on the behaviour and mindset of an entrepreneur in a start-up for simplicity of analysis and building of the conceptual framework. The concept can then be extrapolated to explain why leadership fails especially in times of continuous change and under stress. The entrepreneurial mindset when internalised by leaders, enables them to lead the organization into uncharted territories and build an innovative culture.

Entrepreneurial mindset [EM] refers to the cognitive, behavioural and emotional structures of the individual, going much deeper than the intent to be an entrepreneur and different from the surface level of learning knowledge (Jun Cui, 2021). The myth on the entrepreneurial mindset was that it is a 'special trait' that you are born with, which was proved otherwise by several researches from 1989 to 2007. The entrepreneurial mindset was what set the entrepreneurs and non-entrepreneurs apart and more importantly, an entrepreneurial mindset could be taught (Naumann, 2017). A simplistic yet accurate definition of an entrepreneurial mindset is the ability to sense, act and mobilize under uncertain conditions (McGrath & MacMillian, 2000). Given the dynamics of the business environment, the ability to adapt the thinking process sets



entrepreneurs apart and defines the entrepreneurial mindset, according to the study by Haynie (2010).

2. Literature Review on Building an Entrepreneurial Mindset

Haynie's situated metacognitive model studies the cognitive ability to examine and restructure one's thinking, adapting the thinking structure as required by the new situation presented. The model describes how the individual's inert motivation conjoined with the entrepreneurial environment, utilises his/her past experiences and knowledge to produce a cognitive response strategy to a situation based on his/her level of awareness. Metacognitive awareness here refers to one's general level of awareness, he/she has of his/her cognitive process. Interestingly, the level of awareness grows in an environment of uncertainty.

For example, a manager in a well-established firm, operating in a structured and stable environment, offering incremental improvements to existing products in existing markets, have a very low level of awareness in terms of metacognitive adaptability. On the other hand, an entrepreneur offering new products in new markets, learning and correcting his thinking process through mistakes have a very high awareness of metacognitive adaptability (Haynie, 2010).

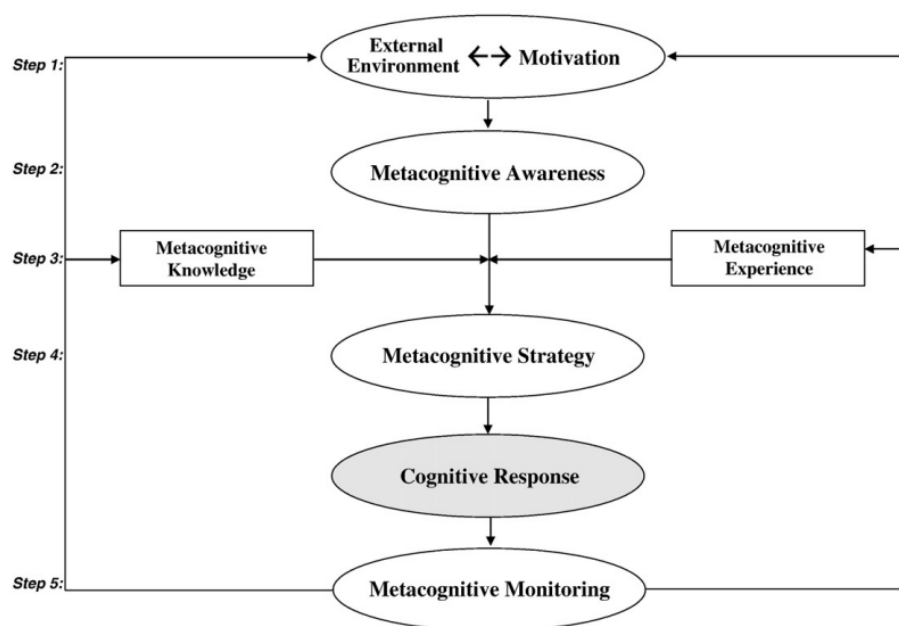


Figure 1. A situated metacognitive model of the entrepreneurial mindset

Source: Haynie, J. Michael et al. "A situated metacognitive model of the entrepreneurial mindset." *Journal of Business Venturing* 25 (2010): 217-229

Prior studies on entrepreneurship elucidate that market opportunities are interpreted in the mind of the entrepreneur and that ventures only come to fruition when possibilities come together in the mind of the entrepreneur, who persists until a venture is created. The mindset acts as a filter on how the entrepreneur views the world and reasons in a certain way. A kind of lens that blocks out certain information, distorts input and emphasizes some input. Mindset is similar to habit patterns, in that it is an auto-response from subconscious programming. However, in contrast to habit patterns, mindset is usually goal-centric where the strategies will be revised until the desired outcome is achieved. (Lynch, 2021). Further, Lynch introduces the element of failure and learning from those experiences into the definition of the entrepreneurial mindset. He argues that making mistakes, learning from the mistakes, changing the strategy and

continuing to pursue the goal sets entrepreneurs apart. Lynch's definition of an entrepreneurial mindset: The sum total of cognitive processes; that lead to an individual's willingness to take action under uncertainty, make errors, learn from failures and shift that learning to specific goals to best solve entrepreneurial tasks.

Expanding on this definition, Lynch introduces two orientations in the entrepreneur's mindset: the mindset of the entrepreneur when he/she is "elaborating" (deliberating and planning) versus "implementing" (acting and evaluating); oscillating continuously until the goal or task is achieved. Entrepreneurs need to make decisions and move forward with action in uncharted domains where information is limited and uncertainty is high. When action is taken (implementing), shortly, the entrepreneur may realise that the decision or strategy needs to be changed or improved, now based on new information. The entrepreneur now moves into the elaboration stage again, deliberating and planning, then shifting back into the implementing stage. For example, Diagram Figure 2 illustrates, how the entrepreneur elaborates, decides on opportunity A and starts implementing. Shortly he/she realises that the strategy is not working and goes back into elaborating, tweaks the plan, decides on Opportunity A* and goes back into implementing. At any point that the strategy doesn't work, he/she goes back into elaborating, makes adjustments, decides on Opportunity A** and goes back in elaborating.

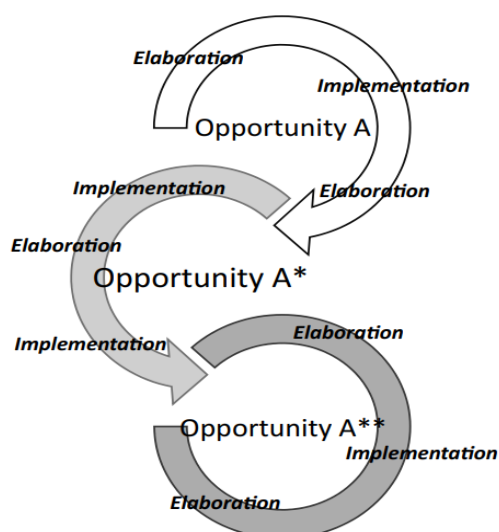


Figure 2. Cycles of learning within the entrepreneurial mindset

Source: Lynch, Matthew Patrick James and Andrew C. Corbett. "entrepreneurial mindset shift and the role of cycles of learning." *Journal of Small Business Management* (2021): 1-22

This cyclic shifting of elaborating and implementing mindsets, done automatically by the subconscious mind, enables the entrepreneur to navigate through the dynamic business environment, continuously learning from mistakes and turning them into new opportunities. This ability to shift between elaborating and implementing with a learning attitude is crucial for the long-term success of the start-up. Fortunately, it can be learned as a habit pattern. Lynch's duality in an entrepreneurial mindset and learning cycles gives depth and context to the definition of an entrepreneurial mindset.

A study by Kuratko, 2021 expands the entrepreneurial mindset to include behavioural and emotional considerations as well. He argues that the entrepreneurial mindset has three aspects to it; cognitive, behavioural and emotional (Kuratko DF, 2021). The cognitive aspect studies how entrepreneurs think. The behavioural aspect studies how the entrepreneur acts towards a

certain opportunity or risk. Thirdly, the emotional aspects look into how the entrepreneur feels in certain situations.

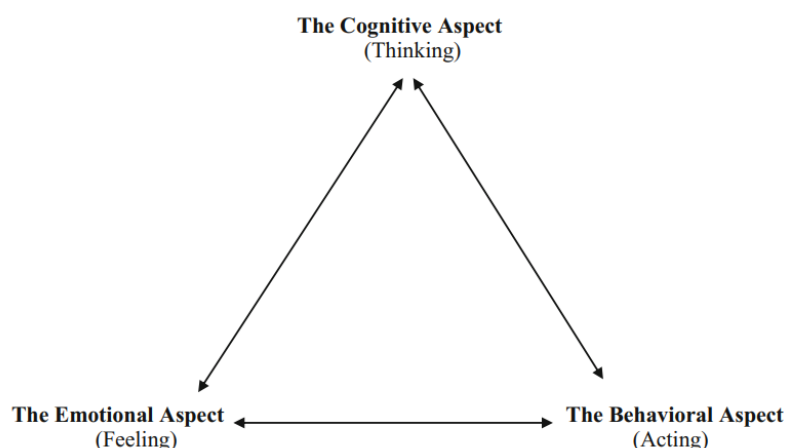


Figure 3. The triad of the entrepreneurial mindset

Source: Kuratko DF, Fisher G, Audretsch DB. *Unraveling the entrepreneurial mindset. Small Business Economics*. 2021;57(4):1681-1691. doi:10.1007/s11187-020-00372-6

Adaptable cognitive ability, the self learns from failures in the entrepreneurs' mindset has been discussed in length using Haynie's models. Lynch's model explains the behavioural aspect where the entrepreneur takes risks, learns from failures, adapts and continues implementation.

Kuratko introduces the third aspect of the entrepreneurial mindset; the emotional aspect of the student. The main drive of entrepreneurial emotions stems from uncertainty. Surprise, anticipation, and stress are internally focused, and these emotions the entrepreneur needs to handle in the confines of his or her mind. How the entrepreneur mitigates these feelings is demonstrated in the running of the business, and the managing of relationships. Friends turned business partners also work well together since there is an established emotional understanding that underpins the relationship. As the venture grows, three factors affecting the entrepreneurs' emotions stand out: risk, stress and ego. The risk here refers to the student's inert ability to digest the uncertainties of entrepreneurship versus a stable corporate career, bringing along financial risk and the risk of losing family and friends who are not aligned with the entrepreneurship goal. This in turn may create a psychological risk that the entrepreneur may not bounce back from. Another factor is the entrepreneur's ability to manage stress when the entrepreneurs' work demands and expectations exceed their abilities to perform as venture initiators, as entrepreneurs have limited resources and need to perform multiple tasks. Lastly, the entrepreneurial ego. In the initial stages, often the idea turns into a venture by the entrepreneurs' belief and strong desire to succeed against all odds. Entrepreneurs maintain high enthusiasm levels that become an external optimism—which allows others to believe in them during rough periods.

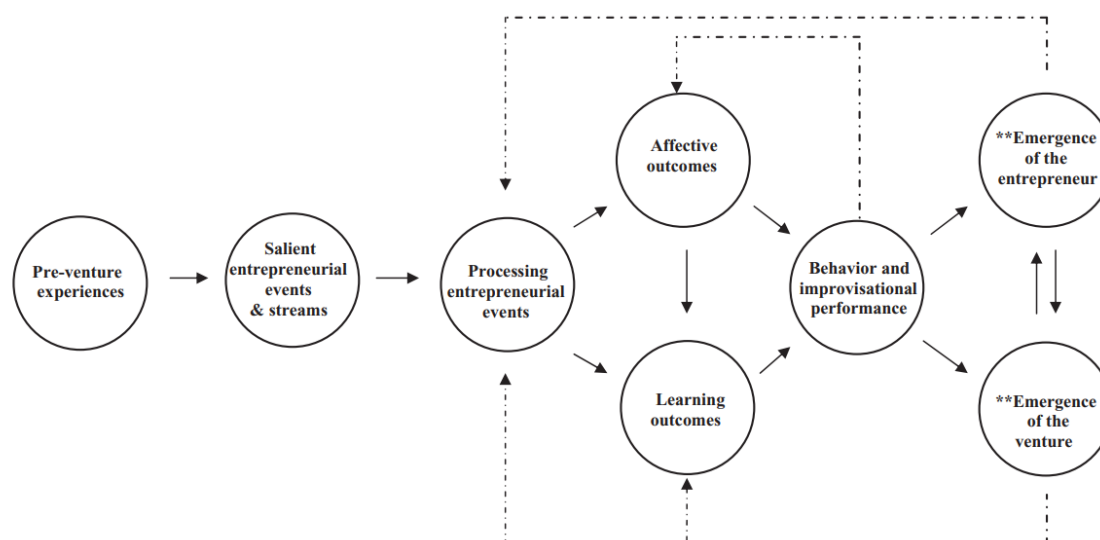
2.1. Emotions and the Cognitive Ability

The ability to manage emotions is essential to being a successful entrepreneur or manager. The obvious reason is that you will manage client relationships better when you can manage your emotions (Cowan, 2021). However, what is often overlooked is the impact emotions have on the cognitive performance of the person. Emotional dissonance occurs when the entrepreneur or manager suppresses the true emotions he/she feels, and instead, the desired emotions for the outcome are expressed. The work and social pressure not to be truthful with one's feelings, create a shield wall against all emotional triggers, causing long-term adverse effects like anger, stress, burnout, lack of empathy, inability to feel love, inability to feel happy etc, adversely

affecting his/her cognitive abilities. Emotional dissonance impacts the mental abilities of a person, including learning, thinking, reasoning, remembering, problem-solving, decision-making, focus and attention span (Hofstee, 2020). Meta-cognition is not possible when the entrepreneur or manager is emotional. Hence, the ability to manage emotions is fundamental in building an entrepreneurial mindset and achieving any goal.

Grichnik (2010) study on how emotions affect opportunity evaluation and exploitation derives 2 theories: emotions as information theory and the information priming effect concept. The first hypothesis is that emotions offer additional information for decision-making by providing heuristic cues. The latter argues that emotions act as a filter to information (Grichnik 2010). Both seem contradictory but are true depending on which SIEP phase the entrepreneur or manager is on. When the manager is highly emotional [in phase E], the emotions act as a filter to opportunity evaluation, hence the information priming effect is active. If the emotion is positive, a positive influence is noticed in opportunity evaluation, if the emotion is negative it has a negative influence in opportunity evaluation (Grichnik 2010). For example, the manager secures a \$100,000 grant; a very optimistic view is adopted in evaluating the opportunity. On the contrary, if the entrepreneur gets fined \$100,000, a pessimistic view will be applied for the same opportunity evaluation. A balanced view is only possible when the manager passes the emotional [E] phase in the SIEP thought process and engages his/her intellect [I]. Only then meta-cognition is enabled and emotions act as information for heuristic cues, experience and knowledge come into effect to heighten the entrepreneur's meta-cognitive awareness in decision making. Interestingly, Grichnik's study also showed that when it comes to exploitation (taking action) of the opportunity, both positive and negative emotions have a negative effect. This infers that emotions paralyse action.

Morris (2012) made a salient point that an entrepreneurial mindset is developed through the entrepreneur's experience of venture creation. The entrepreneur is a work in progress and his mindset is built and continuously developed in the entrepreneurial journey. Figure 4 illustrates Morris's Conceptual Model of Entrepreneurial Experiencing. This holds for managers in their career journey as well. Past experiences influence how the entrepreneur or manager perceives and interprets current events. However, the crucial point is; that how the entrepreneur or manager interprets and processes the current salient events and streams of events; will result in the feeling and emotions presently experienced. Hence, managing the current feelings and emotions experienced becomes pivotal in managing the experience and interpreting the learning outcomes to build the desired entrepreneurial or goal-focused mindset. This determines the behaviour, actions and performance. Over time, the mindset is built, shaping the entrepreneur or manager alongside the growth of the venture or organization.



Note: The solid arrows between the emergence of the entrepreneur and the emergence of the venture demonstrate the connection between the two. Please note that emergence does not follow the preceding circles but is continuous and ongoing, happening in tandem with the other circles (variables). Solid lines, direct relationships; dotted lines, feedback loops.

Figure 4. Conceptual Model of Entrepreneurial Experiencing

Source: Morris, Michael; "Framing the Entrepreneurial Experience"; (2012)

3. Introducing S-I-E-P in Managing Emotions

This study examines the results of a Malaysian Business Incubator called ET Ideas. ET Ideas started in 2008 and in just 15 years grew over 30 active businesses in various stages of growth. ET Ideas has an astounding 80% success rate in developing start-ups when the worldwide statistics report that only 1 in 10 start-ups succeed. 90% of start-ups fail [Patel, 2015]. A more recent study of tech start-ups in India showed 80% fail within the first 3 years (Kalyanasundaram, 2021). Hence, an 80% success rate is an amazing feat indeed! Even in 2020, when the pandemic hit, the resilience and adaptability of the ET Ideas companies were remarkable. All the companies adapted, survived and innovated into new services or products, capturing new markets. 95% of the start-ups have come out thriving during the pandemic. The remaining 5% is in the tourism industry, sustaining and waiting for the industry to open up.

Interviewing the founder of ET Ideas concurred that the emphasis was on building the mindset of the entrepreneur first even before working on the business ideas. Typically, the entrepreneur builds his/her mindset, skills and habit patterns by working in a more established company. Only when he/she is ready do they proceed to work on the business idea and start building the start-up. The first lesson of entrepreneurship or leadership introduced was on managing emotions using a step-by-step process called S-I-E-P. This abbreviation stands for Spirit, Intellect, Emotions and Physical Senses. In this study, we adapted the S-I-E-P process practiced by ET Ideas start-ups into a conceptual framework to help manage emotions (Figure 5). All ET Ideas leaders and entrepreneurs learn and apply this framework in their everyday lives.

SIEP is a process practiced to manage emotions and catapult meta-cognition. There is no prior academic publication on the SIEP Model and this study will define and determine how the SIEP Model helps to manage emotions (Figure 5). The SIEP Model is built on taking deep breaths to manage emotions (Brenner J, 2020). Deep breaths engage the conscious mind, cutting off the automatic subconscious reaction. This cuts off oxygen, literally from the emotions to engage the intellect.

Most people are reactive in their thinking process. Physical senses are a strong trigger in activating the subconscious programming. The physical senses referred to are; the sense of

hearing, sight, smell, taste and lastly the sense of touch. When these senses are activated, an automatic knee-jerk reaction occurs from the individual's subconscious programming (The Senses, 2020).

Emotions are triggered automatically based on the individual's perception and belief system that surrounds the incident or event. This digs into the individual's subconscious programming; which comes from repeated past experiences, types of movies watched, songs listened to or books read. The other person's tone, gestures and expression, witnessed by the senses, are interpreted, within split seconds to form a judgment or conclusion, corresponding with the individual's subconscious programming. This triggers the related emotions on auto response and the intellect is used to validate the judgment made, usually blaming and finding fault in the situation, the other person, the government, circumstances beyond their control etc. The spirit is not at peace and experiences turmoil given the constant reactive input from the senses, emotions and intellect. This process is called the PEIS way of thinking.

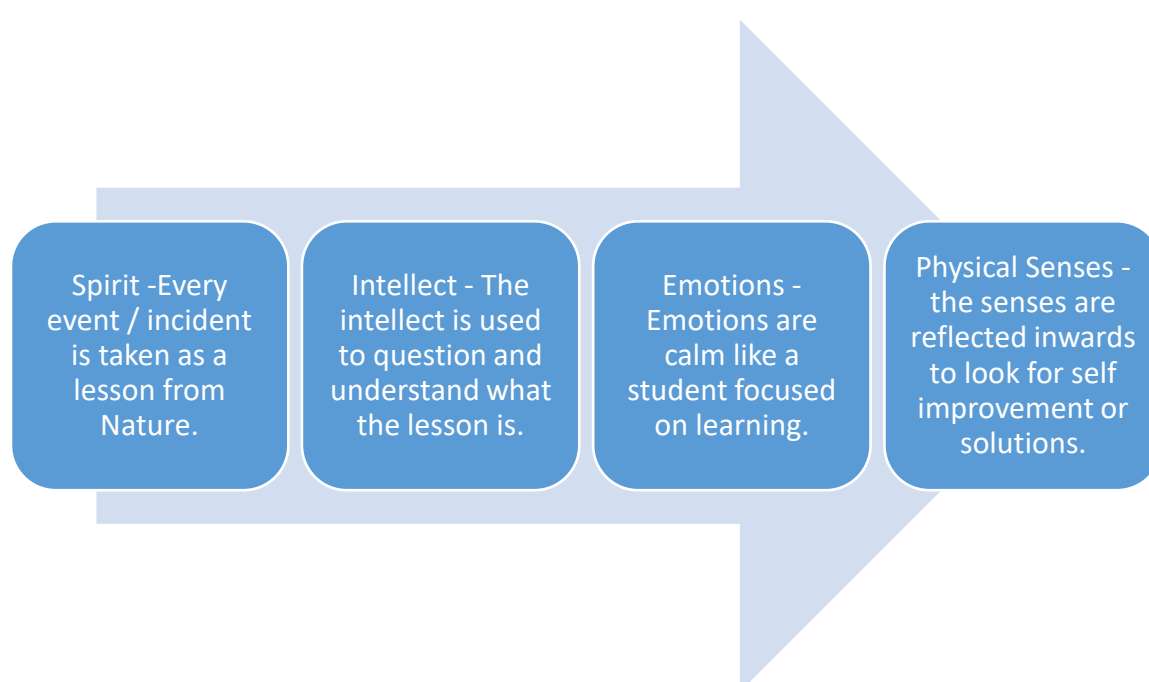


Figure 5. The SIEP Method of Thinking Conceptual Framework

Source: Adapted from ET Ideas, a business incubator in Malaysia

To manage emotions, one has to be aware of this PEIS way of thinking taking place first. Then the individual has to choose to stop the process by taking deep, silent breaths for 10 minutes, at least, to disengage from the PEIS process and subconscious mind activation and activate the conscious mind intentionally.

Once the emotions are calm, the individual can choose the SIEP way of thinking, which starts with the spirit instead of the physical senses. The individual has to use willpower to engage the process from the spirit by accepting that Nature is teaching through the person or incident. Once the student's mindset is activated, the emotions will be calm and the intellect will focus on finding how the individual contributed to the incident, what solutions are available, how to prevent this in the future etc, hence critical and objective thinking is activated. This reverse process often results in self-reflection and an increase in awareness of how the individual's subconscious mind is programmed; metacognition occurs. The individual becomes more aware of their reactive habit patterns and has better awareness to stop this reactive habit the next time around until, over time the habit is replaced by a new habit pattern.

Mood disorders, such as depression and anxiety, can significantly affect cognitive processes. For example, depression is associated with cognitive biases, including negative thinking patterns and reduced attention and memory capacity referring to Beck's 1967 cognitive model of depression (Disner, 2011). Chronic stress can impair cognitive functioning. Studies have shown that prolonged exposure to stress hormones, such as cortisol, can negatively affect memory, attention, and decision-making (McEwen, 2008). Learning how to manage emotions using SIEP on the onset acts as prevention to this extremity.

On the brighter side, other research suggests that positive emotions can enhance creativity and problem-solving abilities (Isen, 2001). People in positive moods tend to think more broadly and flexibly, which can lead to more creative solutions. Studies also show that emotions can enhance memory. Emotionally charged events are more likely to be remembered than neutral events. This phenomenon is known as the "emotional enhancement of memory" (Phelps, 2004). The ability to consciously choose to engage the desired emotions using SIEP enables one to switch on creative and problem-solving abilities when needed.

The intellect emerges as an antenna for opportunities when the SIEP model is applied. Research on cognitive biases and heuristics substantiates how individuals' thinking patterns and mental shortcuts can influence their perception of opportunities (Kahneman, 2015). Shane and Venkataraman (2000) emphasize the importance of the cognitive process in recognizing and exploiting opportunities. McMullen and Shepherd (2006) conducted a study that explores the concept of entrepreneurial alertness, which is the ability to notice and sense opportunities. The SIEP model infers that when the individual can consistently manage emotions, the intellect will operate at its optimal intellectual capacity and cognitive alertness is enhanced, naturally attracting opportunities.

4. S-I-E-P in Shaping the Organizational Culture

The SIEP Model, which focuses on managing emotions and enhancing meta-cognition, can be a valuable tool for leaders in the organizational context. Here's how leaders can employ this model:

Self-awareness: Leaders should start by practicing self-awareness using the SIEP Model. They need to understand how their emotions are triggered and how their past experiences and beliefs influence their reactions to various situations. By recognizing their own emotional triggers and cognitive biases, leaders can become more emotionally intelligent. They will be better people managers.

Emotion Regulation: The SIEP Model emphasizes managing emotions effectively. Leaders should learn how to regulate their emotions in high-pressure situations. This includes techniques such as deep breathing, mindfulness, and reframing negative thoughts. When leaders can keep their emotions in check, they are better equipped to make rational decisions. The leaders are able to handle stress better, stay calm and think critically.

Meta-cognition: Encourage meta-cognitive thinking among team members. Leaders can promote a culture of reflection and critical thinking. This involves encouraging employees to think about their thinking (meta-cognition) and question their automatic reactions to situations. Leaders can set an example by openly sharing their thought processes and decision-making strategies.

Training and Development: Implement training programs that teach employees the principles of the SIEP Model. This can include workshops and coaching sessions that help employees recognize their automatic emotional responses and provide strategies for more thoughtful and balanced reactions.

Conflict Resolution: Leaders can use the SIEP Model to facilitate conflict resolution within teams. By helping team members understand how their emotions and past experiences influence their perceptions, leaders can mediate conflicts more effectively. This can lead to more constructive and less emotionally charged discussions.

Decision-Making: When making important decisions, leaders should encourage a systematic approach that includes considering the emotional and cognitive aspects. By taking the time to evaluate their emotional responses and biases, leaders can make more informed and rational decisions.

Cultural Sensitivity: In diverse organizations, leaders should be aware of how cultural backgrounds can influence individuals' emotional triggers and cognitive processes. The SIEP Model can be used to promote cultural sensitivity and understanding, fostering a more inclusive workplace.

Feedback and Improvement: Continuously gather feedback from employees on how well the SIEP Model is being implemented and its impact on their emotional intelligence and decision-making. Use this feedback to refine and improve the application of the model within the organization.

Leadership by Example: Ultimately, leaders should lead by example. They should demonstrate the principles of the SIEP Model in their own behaviour and decision-making. When employees see their leaders effectively managing emotions and making well-thought-out decisions, they are more likely to follow suit.

Integration into Organizational Values: Consider integrating the SIEP Model principles into the organization's core values and mission. This reinforces the importance of emotional intelligence and meta-cognition in the organizational culture.

5. Conclusion

Despite the focus on leadership development and the numerous books and courses on leadership, leadership fails when it is needed most. This study puts forward the argument that emotions impact the cognitive abilities of leaders. During times of frequent change and under stress, emotions like fear, anger, insecurities and the like surface and the leader's cognitive ability is compromised. Metacognition is not possible, hence learnings from books and courses cannot be applied. Automatic reaction and behaviours deep in their subconscious programming are acted out. To learn and apply the chosen leadership style, the leader needs to be able to manage his / her emotions first using the SIEP conceptual framework. Then metacognition is possible and new habit patterns can be formed.

Stress, burnout and toxic organizational culture can be prevented if SIEP is incorporated as part of change management and employees and managers learn and nurture the ability to manage emotions as they feel it in the early stages. Emotions are not suppressed and the employee does not experience emotional dissonance in doing his/her job if SIEP is correctly applied. On a more empowering note, the ability to consciously choose to experience the desired emotions enhances the positive sides of emotions. The ability to consciously choose to operate at optimal intellectual capacity in turn enables the alertness to identify opportunities and catapults innovation. Slowly but surely an innovative and happy work culture is developed.

In summary, leaders can employ the SIEP Model in the organizational context by promoting self-awareness, emotional regulation, meta-cognitive thinking, and a culture of thoughtful decision-making. The result: a happier and more effective workplace.

References

- Brenner, J., LeBlang, S., Lizotte-Waniewski, M., Schmidt, B., Espinosa, P. S., DeMets, D. L., & Hennekens, C. H. (2020). Mindfulness with paced breathing reduces blood pressure. *Medical hypotheses*, 142, 109780. <https://doi.org/10.1016/j.mehy.2020.109780>
- Cowan, P. (2021). *Connecting with Clients: For stronger, more rewarding and longer-lasting client relationships*. Harriman House Limited.
- Cui, J. (2021). The impact of entrepreneurship curriculum with teaching models on sustainable development of entrepreneurial mindset among higher education students in China: the moderating role of the entrepreneurial climate at the institution. *Sustainability*, 13(14), 7950. <https://doi.org/10.3390/su13147950>
- Disner, S. G., Beevers, C. G., Haigh, E. A., & Beck, A. T. (2011). Neural mechanisms of the cognitive model of depression. *Nature Reviews Neuroscience*, 12(8), 467-477. <https://doi.org/10.1038/nrn3027>
- Grichnik, D., Smeja, A., & Welp, I. (2010). The importance of being emotional: How do emotions affect entrepreneurial opportunity evaluation and exploitation?. *Journal of Economic Behavior & Organization*, 76(1), 15-29. <https://doi.org/10.1016/j.jebo.2010.02.010>
- Haynie, J. M., Shepherd, D., Mosakowski, E., & Earley, P. C. (2010). A situated metacognitive model of the entrepreneurial mindset. *Journal of business venturing*, 25(2), 217-229. <https://doi.org/10.1016/j.jbusvent.2008.10.001>
- Hofstee, G., Jansen, P. G., De Lange, A. H., Spisak, B. R., & Swinkels, M. (2021). The cognitive costs of managing emotions: A systematic review of the impact of emotional requirements on cognitive performance. *Work & Stress*, 35(3), 301-326. <https://doi.org/10.1080/02678373.2020.1832608>
- Isen, A. M. (2001). An influence of positive affect on decision making in complex situations: Theoretical issues with practical implications. *Journal of consumer psychology*, 11(2), 75-85. https://doi.org/10.1207/S15327663JCP1102_01
- Kahneman, D. (2015). *Kahneman's Thinking Fast and Slow: From Bestseller to Textbook: Thinking, Fast and Slow*. RAE Revista de Administracao de Empresas.
- Kuratko, D. F., Fisher, G., & Audretsch, D. B. (2021). Unraveling the entrepreneurial mindset. *Small Business Economics*, 57, 1681-1691. <https://doi.org/10.1007/s11187-020-00372-6>
- Lynch, M. P., & Corbett, A. C. (2023). Entrepreneurial mindset shift and the role of cycles of learning. *Journal of Small Business Management*, 61(1), 80-101. <https://doi.org/10.1080/00472778.2021.1924381>
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial action and the role of uncertainty in the theory of the entrepreneur. *Academy of Management review*, 31(1), 132-152. <https://doi.org/10.5465/amr.2006.19379628>
- McEwen, B. S. (2008). Central effects of stress hormones in health and disease: Understanding the protective and damaging effects of stress and stress mediators. *European journal of pharmacology*, 583(2-3), 174-185. <https://doi.org/10.1016/j.ejphar.2007.11.071>
- Morris, M. H., Kuratko, D. F., Schindehutte, M., & Spivack, A. J. (2012). Framing the entrepreneurial experience. *Entrepreneurship theory and practice*, 36(1), 11-40. <https://doi.org/10.1111/j.1540-6520.2011.00471.x>

- Naumann, C. (2017). Entrepreneurial mindset: A synthetic literature review. *Entrepreneurial Business and Economics Review*, 5 (3), 149-172. <https://doi.org/10.15678/EBER.2017.050308>
- Phelps, E. A. (2004). Human emotion and memory: interactions of the amygdala and hippocampal complex. *Current opinion in neurobiology*, 14(2), 198-202. <https://doi.org/10.1016/j.conb.2004.03.015>
- Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of management review*, 25(1), 217-226. <https://doi.org/10.5465/amr.2000.2791611>
- The Senses: A Comprehensive Reference. (2020). Academic Press.
- Tytler, R., Symington, D., & Smith, C. (2009). *A Curriculum Innovation Framework for Science, Technology and Mathematics Education*. Springer Science + Business Media B.V. <https://doi.org/10.1007/s11165-009-9144-y>