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A Practical Guide to CPS Training

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A Practical Guide to CPS Training

by

Glen Fayolle

A Project
in
Creative Studies

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science

January 2016

Buffalo State
The State University of New York
Department of Creative Studies

ABSTRACT OF PROJECT

A Practical Guide to CPS Training

This Master's Project is focused on how I as a Creative Problem Solving (CPS) practitioner might more effectively and concisely teach the CPS process and tools to an audience of laypeople in a manner that:

- They can quickly grasp and understand the basic concepts and principles.
- Encourages them to start using the tools and process immediately.
- Spurs them on to continue developing their knowledge of and their skills in the application of CPS process and tools.

Note. In this paper when capitalized as a proper noun "Creative Problem Solving" (CPS) refers to the process originally developed by Osborn (1953). In lower case, creative problem solving refers to general creative thinking applied to challenges and problems.

Signature

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January 28, 2016

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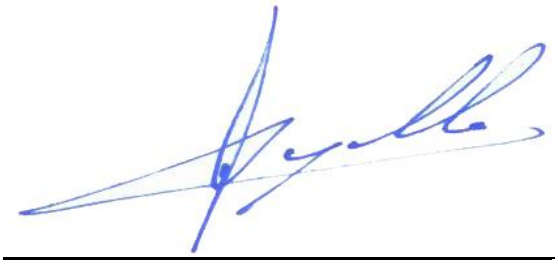

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SECTION ONE: BACKGROUND TO THE PROJECT

Personal Compelling Case

I have been a professional creative problem solving (CPS) practitioner since 1999, and in those 17 years I have taught the CPS process and various tools associated with CPS to a wide variety of audiences; ranging from elementary school children to springboard participants at the Creative Problem Solving Institute, all the way through to senior executive teams at major corporations. Over that time I have developed and tested various methods of teaching the CPS tools and process, and I have designed a variety of handouts to support these teachings in an effort to encourage the participants to put the tools and process into practice.

The anecdotal, but overwhelming, feedback that I have received from participants post workshop is that, although they find that the CPS process and tools make sense in a learning setting, they tend to shy away from their practical application for the following main reasons:

- CPS is perceived as extra work.
- Away from the workshop and guidance of an experienced instructor, CPS is perceived as complex and confusing when applied to real world problems.
- The various CPS steps and tools can be confusing, hard to remember and thus difficult to put into practice.
- If CPS does not happen naturally they are not interested in doing it.

Upon reflection on this and other feedback that I have received over the past 17 years, my diagnosis is that as an experienced CPS practitioner I may be suffering from a serious case of knowledge bias when it comes to teaching laypeople about the process and tools. I believe that this may be manifesting itself in two primary ways:

- Because the fundamental tools and concepts that support the CPS process are of second nature to me, I tend to overlook how impactful they are when first revealed to a layperson. For example, understanding and drawing meaning from the principle of deferment of judgment, or making the distinction between divergent and convergent thinking for most people requires a not insignificant “mindshift”.
- Knowing and fully understanding the power and value of the full CPS process, my bias is to teach the process in its entirety, often overwhelming my audience with too much information about the process and tools.

Why CPS?

My focus in this paper is on teaching the CPS process not just because that is where my creative problems solving roots and lineage emanate from but, more importantly, because I have firsthand experience and knowledge that the CPS process works. Since becoming a professional CPS practitioner, I have successfully facilitated the CPS process on a wide variety of real world challenges. As someone who has gained a tremendous amount, both personally and professionally, from learning and the application of the CPS process and tools, I believe that it is incumbent upon me to pass on this knowledge and experience to as many people as possible.

CPS has been widely studied, researched and subsequently enhanced since its inception in 1953 (Osborn) and as Puccio, Firestein, Coyle & Masucci (2006) have pointed out in their review of the effectiveness of CPS training, "After evaluating a wide range of studies, that included investigations both in organizational and school settings, these authors (Scott et al., 2004) concluded that among the various training programs CPS proved to be one of the most successful." (p. 21).

SECTION TWO: PERTINENT LITERATURE

The bulk of my research for this project has been around the learning process, with an emphasis on the role of creativity in the learning process.

How The Brain Learns

I deliberately started my research with the book, *How The Brain Learns* (Sousa, 1995) because I wanted to establish a solid understanding of the fundamental elements of how the brain works and how learning occurs. Here are my key insights and learning from that book.

For new learning to successfully move through the filtering process of our perceptual register and short-term memory, into our working memory and eventually into our long-term memory, the new learning must make sense and have meaning. In this context, sense corresponds to does this new learning match my existing knowledge and view of the world? Also, in this context meaning corresponds to how is this new learning relevant to me? Sense and meaning are independent variables, with meaning being the most important when it comes to long-term memory. In essence, if the new learning does not have personal meaning then it is unlikely to be committed to long-term memory and is unlikely to be recalled or used in the future. This is a very important insight and highlights the significant of the strategy that relates to giving purpose and motivation as part of the Heightening Anticipation stage of the Torrance Incubation Model (Torrance, 1979; Torrance & Safter, 1990); described in greater detail later in this document. In addition, Sousa also identifies the process of transfer as being an important key element of learning and creative output. "New research is revealing that students are more likely to gain greater understanding of and derive greater pleasure from learning when allowed to transform the learning into creative thoughts and products." (Sousa, 1995, p. 9) This insight is interesting because it also highlights the significance of giving purpose and motivation strategy.

In addition, it also points to the importance of the strategies relating to Extending the Learning, such as giving information personal meaning and relating to future image.

The primary-recency effect is also identified as a key element in the learning process. The primary-recency effects holds that the amount of new information that is retained depends to a large extent on (1) when the new information is presented during the learning episode, and (2) the duration of the learning episode.

The timing of when new information is presented is important because "In a learning episode, we tend to remember best that which comes first, and remember second best that which comes last. We tend to remember least that which comes just past the middle of the episode." (p. 37). Sousa has labeled the first phase Prime-time-1, the second phase Down-time, and the third phase Prime-time-2.

Equally as important is the length of the learning episode, and according to Sousa the ideal length being around twenty minutes. "Try to package lesson objectives (or sub-learnings) in teaching episodes of about twenty minutes. Link the sub-learnings according to the total time period available, e.g., two 20-minute lessons for a 40-minute teaching period, three for an hour period, and so on." (p. 58).

Sousa is very prescriptive on how and when new learning should be delivered. "New information or skills should be taught first, during Prime-time-1, since it is most likely to be remembered." (p. 38) "The new information or skill being taught should be followed by practice or review during the Down-time. At this point, the information is no longer new and the practice helps the learning organize it for further processing. Closure should take place during Prime-time-2, since this is the second most powerful learning position and an important opportunity for the learning to determine sense and meaning." (p. 39)

Finally, Sousa is also a proponent of chunking and practicing, and even though these two elements are discussed separately in his book, to me it seems that they may be opposite sides of the same coin. Chunking is the process of clustering sets of new knowledge, information or data to ease the learning process, while "Practice should be limited to the smallest amount of material or skill that has the most meaning for the student. This allows for sense and meaning to be consolidated as the student uses the new learning." (p. 59) If learning by chunking together with practicing are overlaid onto the ideal timing of twenty minute learning episodes, it would suggest that new learnings should also to be limited to the smallest amount of materials or skills that has the most meaning for the student.

Sousa also points out that research shows that 95% of our learning happens through three of our senses; touch, sight and sound. This insight serves as a reminder that during a learning episode, where possible new learning should be presented and experienced in a manner that appeals to all three of these senses.

Next is a mindmap of *How The Brain Learns* highlighting the areas from which the key insights were drawn.

Key Insights from How The Brain Learns

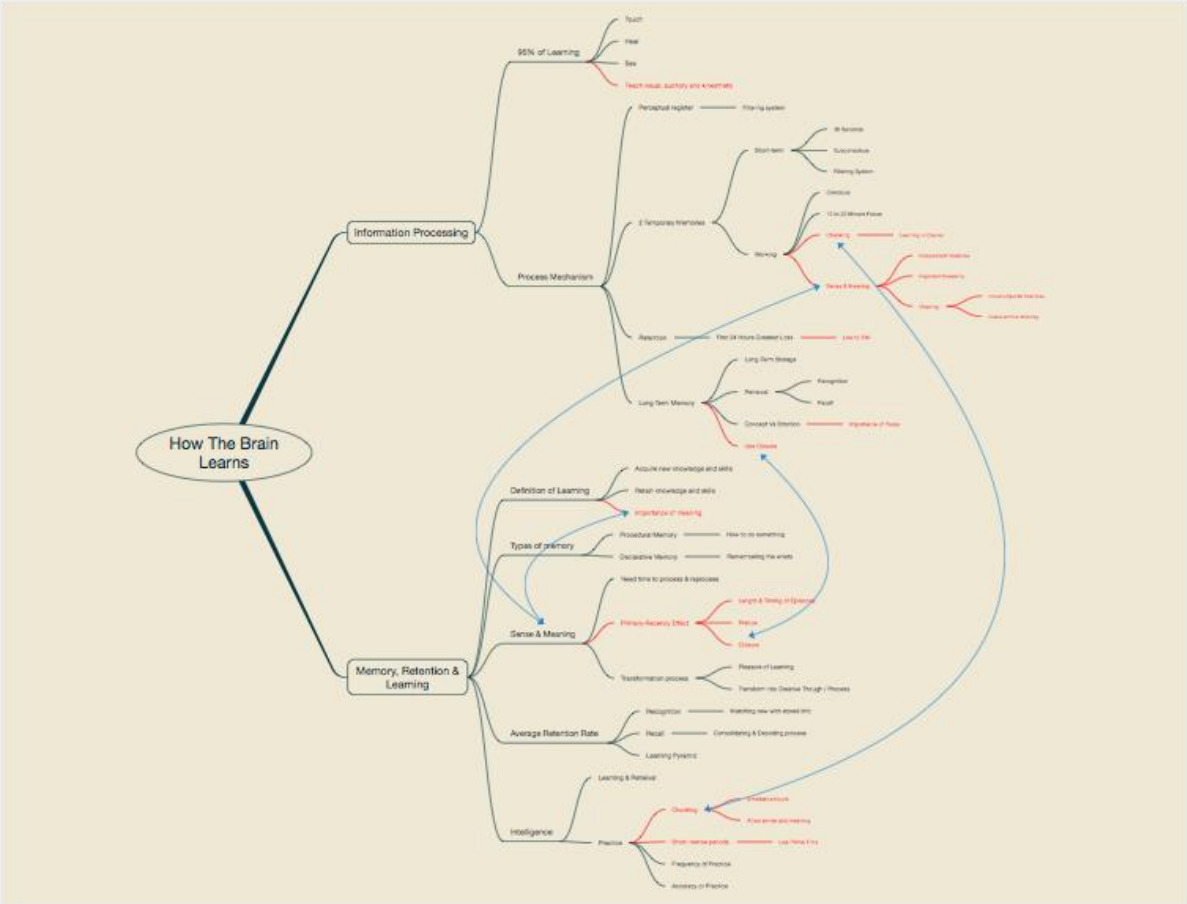

Figure 1. Key insight from How The Brain Learns

How We Learn

Next, I wanted to explore more recent thinking and discoveries on learning, so I turned my attention to the work Carey (2014) published in his book *How We Learn.*

Many of the key insights in this book relating to learning and retention seem to have a strong correlation to the Torrance Incubation Model (TIM). The concept of distributed learning or the spacing effect, which shows that people learn as much and retain for a lot longer when the learning event is spread over a longer period of time, can be mapped directly over the TIM. Pretesting ahead of a learning episode in an effort to engage the learner in a different way is an interesting twist on how to heighten the anticipation. According to Carey, this pretesting consequently results in deepening the imprint of the correct answer when it is revealed. The idea of mixed and varied practice or interleaving, is very much part of the deepening expectations process. Finally, extending the learning is achieved through practice and incubation.

Two related concepts presented in this book that were completely new to me were percolation and interrupted learning. Percolation like incubation is a subconscious process where the brain plays with the challenge, disassembling and reassembling its elements in search of a solution, however percolation takes place over a longer period of time. Interrupted learning is a very distinct element of the percolation process. "On average, participants remembered 90 percent more of the interrupted and unfinished assignments than the ones they'd completed. Not only that, the interrupted and unfinished jobs were at the top of their lists - the first ones they wrote down."(p. 136). Building on the experiments conducted by Dively (2006), during which Carey suggests that "she made percolation visible" (Carey, 2014, p. 146) through a very deliberate interrupted learning process supported by journaling, Carey identifies three elements that make up the percolation process. "Those are the first two elements of percolation:

interruption, and the tuned, scavenging mind that follows. The journal entries provided the third element, conscious reflection." (p. 146) Deliberate percolation, through an interrupted learning and journaling process, is an interesting concept on how the learning process might be enhanced during the learning episode, especially for multiple day events, and also extended past the learning episode.

Next is a mindmap of *How We Learn* highlighting the areas from which the key insights were drawn.

Key Insights from How We Learn

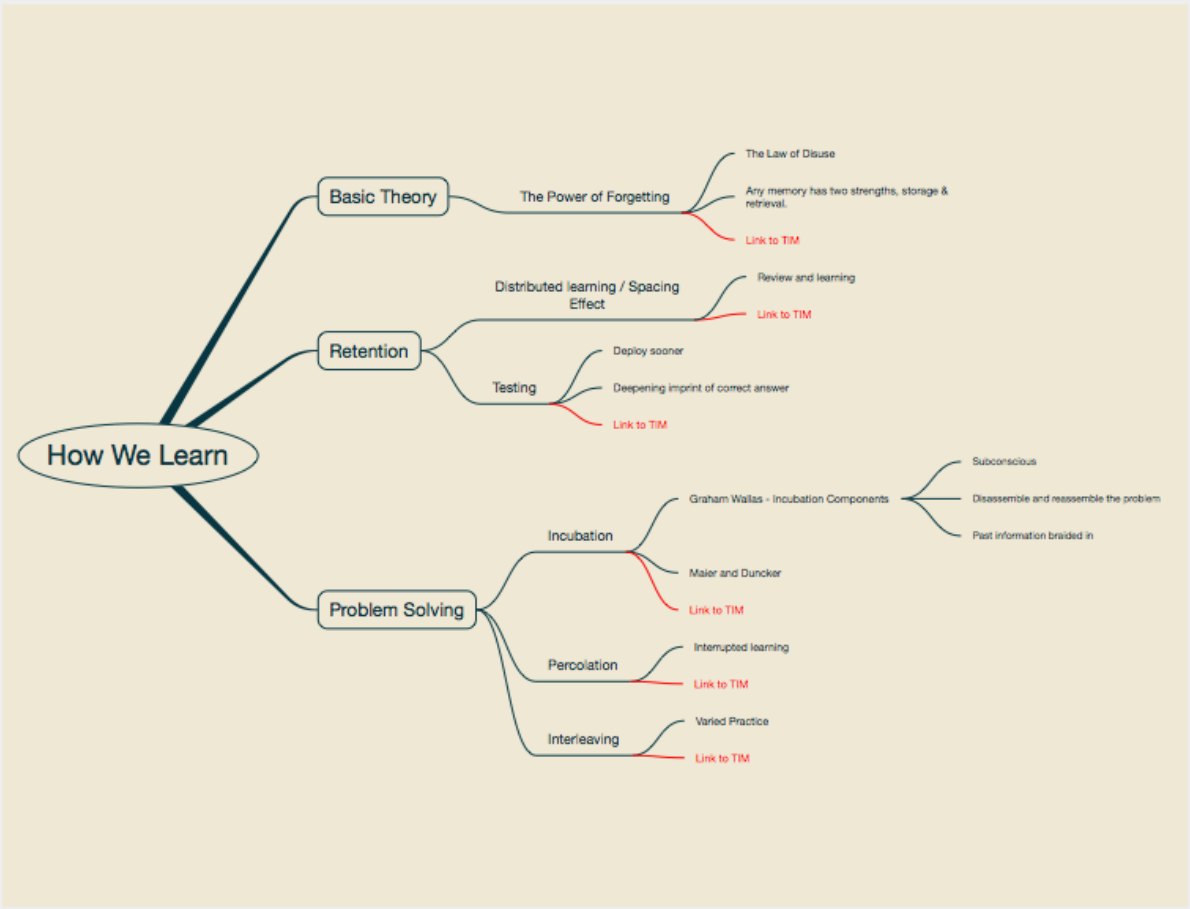

Figure 2. Key insights from How We Learn.

Torrance Incubation Model

My next step was to re-examine and enhance my knowledge of the Torrance Incubation Model, which I undertook by reviewing the work of several authors, including the originator, E. Paul Torrance himself.

The Torrance Incubation Model of Teaching and Learning (TIM) (Torrance, 1979; Torrance & Safter, 1990) is a three-stage learning design process, which integrates creativity skills with content and knowledge. "At its heart, the TIM is a way to help educators create lesson plans to extend the creative thinking skills of their students at the same time as teaching the disciplinary content." (Burnett & Keller-Mathers, in press). The three stages of the TIM are interlocked in a manner that supports the distributed learning of new knowledge and the development of creative thinking skills, and is particularly relevant for this project because it is a learning design process that relates directly to the teaching of creative thinking skills.

Heightening Anticipation is the first stage of the TIM, where the objective is to begin the engagement process and to prepare the student for the learning episode. Torrance & Safter (1990) identified six strategies that could be used at this stage and of particular interest for this project is the sixth strategy; giving purpose & motivation, because as Murdock & Keller-Mathers (2008b) pointed out "Engagement is the key to motivation - finding some anchor point, some intrigue, some curiosity, some point of interest that will get and sustain attention long enough for the person to commit creative energy to the task." (p. 18). As we saw earlier in this document, this sentiment is also reflected in Sousa's (1995) work where he argues that for new learning to successfully make it through to our long term memory, it needs to make sense and have meaning, with meaning being the most important element. Burnett & Keller-Mathers (in press) put it best "The final prompt, setting the purpose and motivation for learning, is a must – especially for

adult learners (Knowles, Holton & Swanson, 2012) – as it connects what is expected of the learner with something meaningful in his or her life." (p. 10)

Deepening Expectations is the second stage of the TIM, where the objective is to acquire new knowledge. For this purpose the educator has a choice of eight information processing patterns or strategies to choose from, which may be used independently or in combination with each other. Many of the key insights gained through my research fall neatly into this stage of the TIM. The previously discussed processes of chunking, interrupted learning, varied practice and transfer would all fit into this stage of the TIM. In addition, the combination of the primary-recency effect and distributed learning provides a really interest road map on how the content might be delivered.

Extending the Learning is the third stage of the TIM, where the objective is to continue the learning past the learning episode, and here the educator has a choice of five information processing patterns or strategies to choose from, which may be used independently or in combination with each other. The primary objective of the educator at this stage of the learning process is to ensure that the student continues to draw meaning and transfers the new learning into creative output.

Building on their extensive knowledge and experience using the TIM to design and deliver creative content, Murdock & Keller-Mathers (2008a) provide a framework for how to leverage the TIM. "In order to effectively teach the content of creativity, we maintain that a person must be explicit in (a) naming what is to be taught; (b) establishing learning objectives to guide instruction; (c) explaining parts, characteristics, uses etc,; and (d) providing practice in using them." (p. 88).

This framework is very useful especially when combined with other strategies such as the primary-recency effect, distributed learning, chunking, transfer, interrupted learning and varied practice to design a learning episode.

Below is a mindmap of my key learnings and insights on Torrance Incubation Model.

Key Insights on the Torrance Incubation Model (TIM)

Figure 3. Key insight on the Torrance Incubation Model.

SECTION THREE: PROCESS PLAN

Goals and Outcomes

My goal is to transform the key insights that I have uncovered through my research on learning, represented in the Mindmap in figure 7, into a process for teaching the CPS process and associated tools to an audience of laypeople in a manner that:

- Makes sense and has meaning for the learner.
- Presents the tools and CPS process in appropriate chunks that are easily understood and immediately applicable by the learner.
- Convinces the learner that the CPS process and tools are simply putting structure around what they are already doing, and are not additional work.
- Encourages the learner to transform their new learning about the CPS process and tools into their own creative output.

The outcome of my work will be an instructional design process for teaching the CPS process and appropriate supporting tools to an audience of laypeople. This learning design process will be built around the three-stage TIM, and will include specific recommendations for tools and processes to be used and/or taught at each stage of the TIM.

Key Insights On The Learning Process

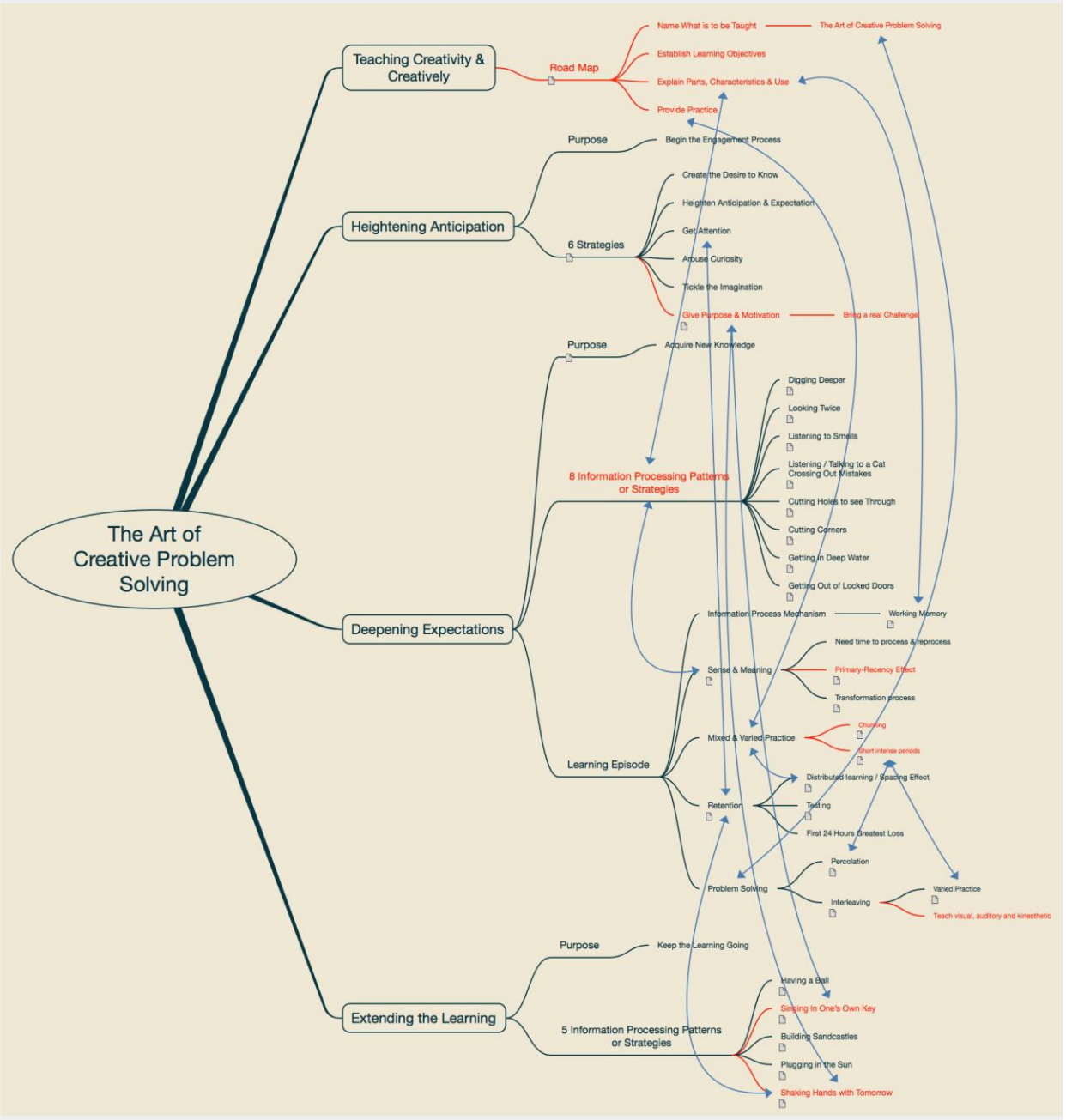

Figure 4. Key insights on the learning process.

Project Timeline

Deliverable	Hours	7 - 13 Sep	14 -20 Sep	21- 28 Sep	29 Sep 4 Oct	5 - 11 Oct	12 - 18 Oct	19 - 25 Oct	26 Oct 1 Nov	2 - 8 Nov	9 - 15 Nov	16 - 22 Nov	23 - 29 Nov	30 Nov 6 Dec	7 -13 Dec	14 - 20 Dec
Skype call with advisor to start project Sep 10																
Started work on concept paper, including literature search for project	18															
Reviewed concept paper and prepare for project write up Oct 22																
Work on section 1, 2 & 3 of project.	90															
Project review with advisor																
Design learning process and document	80															
Field test the proposed instructional design	6															
Capture key learnings	30															
Write conclusions	30															

Figure 5. Project timeline.

SECTION FOUR: OUTCOMES

Outcomes

Building on the key insights from my research in conjunction with the Murdock & Keller-Mathers (2008a) framework on how to leverage the TIM, here are my ideas on how I might more effectively teach the CPS process and tools, in order to achieve the goals set out in the abstract of this document.

As part of the instruction design process, I produced two documents; a practitioners guide for me as a CPS practitioner, and a users manual for my audience. The practitioners guide is a detailed instruction manual on how I am going to teach the CPS process and appropriate supporting tools to an audience of laypeople. This manual outlines the learning objectives for each stage of TIM in relation to the CPS process and tools, and attempts to make the connection between the use of specific strategies to support the learning of distinct elements of the CPS process and related tools.

The users manual is a work book in which the learner will be encourage to personalize and transfer his/her learning of the CPS process and tools. In addition to summarizing the key insights from the learning episode, the workbook will also serve as a guide that the learner can rely on to extend the learning beyond the learning episode.

I intend to personally field-test both of these documents, with my first opportunity being a creativity workshop that I will be delivering in March 2016.

Name What is to be Taught

As the focus is on teaching the fundamental CPS process and tools to an audience of laypeople, the session will be named *Creative problem solving 101: The fundamental tools and elements of the Creative Problems Solving process*.

Establish Learning Objectives

The research is very clear; new learning has to make sense and have meaning if it is to make it to long-term memory. (Torrance, 1979; Torrance & Safter, 1990; Sousa, 1995; Carey, 2014). To ensure that the new learning of CPS process and tools makes sense and has meaning for a layperson, my research also suggests that the new learning should be chunked into the smallest amount of skill or information from which the learner can draw sense and meaning. (Sousa, 1995).

To facilitate the process of making sense, I am proposing that the new learnings should be presented in terms of tool-sets and skill-sets. The tool-sets would be chunks of tools drawn from the CPS process or supporting tools, while the skill-sets would be chunks of skills on how to apply the tool-sets.

To facilitate the process of drawing meaning, the new learning should be presented in terms of mind-sets. Mind-set refers to the learner's attitude or disposition to the new learning.

The learning objectives for an audience of laypeople would therefore be:

- Teach the fundamental CPS tool-sets.
- Develop introductory CPS skill-sets.
- Enhance the learner's mind-set towards the adoption and practical application of the CPS process and tools.

Explain Parts, Characteristics and Use

My first course of action with regard to the content was to try to identify chunks of CPS process and tools that would fall into the categories of tool-set, skill-set and mind-set. I started with an analysis of the eight information processing patterns and strategies that make up the Deepening Expectations stage of the TIM, to see if any of these could be relabeled and consequently clustered into chunks and this is what I deduced:

- Digging deeper is akin to the Clarify stage of the CPS process, because it is about going deeper, beyond what is immediately apparent to diagnose the real challenge.
- Looking twice is about deferment of judgment.
- Listen to smells is divergent thinking through the use of senses.
- Listening / talking to a cat is deferment of judgment and divergent thinking, because it is about allowing the information "talk to you" as well as making guesses in search of a better solution.
- Cutting holes to see through is convergent thinking, because it is about cutting out erroneous information to get to the essence.
- Cutting corners is also convergent thinking, because is it about avoiding useless or irrelevant information.
- Getting in deep water is about the power of questions and questioning.
- Getting out of locked doors is divergent thinking because it is about seeing things from different perspective.

I conducted the same analysis of the five information-processing patterns and strategies relating to extending the learning and this is what I found.

- Having a ball is about mind-set.

- Singing in one's own key is about mind-set and especially one's individual type and style or psychological preferences, because it is about being true to self and understanding how we relate to information.
- Building sandcastles is about divergent thinking and the Ideate stage of the CPS process since it is about searching for solutions.
- Plugging in the sun is about the Develop and Implement stages of the CPS process, since it is about following up on information and finding available resources.
- Shaking hands with tomorrow is about the mind-set of drawing meaning and divergent thinking, especially when it comes to connecting to the future.

Reorganized, these new labels could be categorized as follows:

- Tool-Set
  - Deferment of judgment
  - Divergent thinking
  - Convergent thinking
  - Power of questions and questioning
- Skill-Set
  - Clarity
  - Ideate
  - Develop
  - Implement
- Mind-Set
  - Having a ball
  - Singing in one's own key

Shaking hands with tomorrow

Next, I turned my attention to how the CPS process and tools are currently being taught at the Creative Problem Solving Institute (CPSI), an annual international conference hosted by the Creative Education Foundation (CEF). CEF is a non-profit organization whose mission is "To engage and develop the next generation of creative thinkers and innovators." (Creative Education Foundation, 2015.) In their creative problem solving resource guide, (Creative Education Foundation, 2014.) which is given to laypeople who attend CPSI, CEF identifies four core principles of Creative Problem Solving. (p. 10):

- Divergent and convergent thinking must be balanced
- Asking problems as questions
- Defer or suspend judgment
- Focus on "Yes, and …" rather than "No, but"

The first three core principles listed, as we have seen from the previous analysis of the TIM fall under the category of tool-set. The fourth element would most likely fall under the category of mind-set since it is a new attitude that the learner has to adopt. An alternative label of this principle might be affirmative judgment.

Initial Tool-Set

If the goal is to chunk the tool-set for the CPS process into its smallest amount of skill or information from which the layperson can draw sense and meaning, then the initial tool-set chunk should included the following core principles:

- Deferment of judgment
- Divergent thinking
- Convergent thinking
- Asking problems as questions

Chunking would also suggest that the number of divergent and convergent tools also be limited to the smallest amount that can be applied at every stage of the CPS process. In an effort not to overwhelm and confuse the learner with additional new learning, I am going to limit the teaching of divergent and convergent tools to only two, until the learner has developed a full understanding of the entire CPS process.

Primary Skill-Set

Similarly, the initial chunk of skill-set for the layperson should be boiled down to the most basic application of the tool-set possible, in a manner that not only supports the learning process (making sense), but more importantly encourages the immediate application of the CPS process (attaching meaning). The smallest chunk of the CPS process that can be taught is a three-stage process:

- Clarify: Start with a challenge that requires a creative solution.
- Ideate: Generate ideas.
- Implement: Implement your ideas. (Creative Education Foundation, 2014.)

This three-stage CPS process has several advantages:

- There is no confusion between the stages as they are very distinct from each other.
- It is easy to understand and remember.
- It provides a simple framework on which to practice the core principles.
- It is easy to associate sense and meaning with each stage of the process.
- Most laypeople intuitively recognize that these three stages reflect their existing efforts when problem solving, and that this process is simply putting structure around what they are already doing.
- It is relatively straightforward to start applying this process to real world challenges.

Secondary Skill-Set

It is only after the learner has fully assimilated and had time to practice overlaying the core principles over the three-stage CPS process, that the fourth stage of Develop should be introduced into the process. (Creative Education Foundation, 2014.) In my experience, teaching the four-stage CPS process right out of the gate can be confusing and overwhelming to an audience of laypeople. The confusion arises mainly because the purpose and distinction between the Ideate and Develop stages is not immediately apparent and, for the uninitiated, the CPS process seems to duplicate itself at this point. There is a more organic way of introducing this fourth stage of Develop to the layperson, and it involves letting the learner realize the shortcomings of the three-stage process through its application.

Ideas coming out of the Ideate stage of the CPS process fall into one of three categories:

- Just do them. These are straightforward, stand alone ideas that just need to be implemented.

- Plan them out. These ideas have to be implemented in concert with other ideas or activities and according to a certain sequence of events, so they need to be planned out before they can be implemented.
- Not quite ready. These are ideas or concepts that are still "half-baked" and require more work in order for them to be fully formulated and implemented.

Most of the ideas that fall into the first two categories can skip the Develop stage of the CPS process altogether and move to the Implement stage. Requiring these types of ideas to go through the Develop stage would add very little, if any, value. The Develop stage is really designed for those "half-baked" ideas that require further intellectual and creative "kneading".

Given enough time and confidence to practice the three-stage CPS process, the learner will very quickly realize that some of the ideas can't neatly move from the Ideate to Implement stage without further work, that is when the Develop stage should be introduced and practiced.

Tertiary Skill-Set

The same reasoning also applies to the three-step Clarify process. The organic way to introduce the three steps of the Clarify stage is by letting the learner realize the shortcomings of the single step Clarify process. With sufficient practice using the four-step CPS process, the learner will invariably realize that sometimes energy and effort is spent working on symptoms rather than on the root cause of a problem. That is when the three-step Clarify process should be introduced.

Mind-Set

Through her research on mindsets, Dweck (Dweck, 2006; Dweck, Chiu, & Hong, 1995; Yeager, & Dweck, 2012.) has identified two types of mindset that people may hold about their attitudes and abilities in various aspects of their lives. The fixed mindset is one in which the person believes that his/her attitudes and ability to learn new skills or abilities is fixed and unchangeable, and they therefore avoid challenges that they deem to be beyond their skills and abilities. In contrast, the growth mindset is one in which the person believes that his/her attitudes and ability to learn new skills can be developed and improved over time, so challenges are seen as opportunities for growth. An extremely important finding from Dweck's research is that mindsets are not fixed and can be changed in either direction. Further more, Dweck has shown how educators, through the use of strategies that are focused on encouraging motivation and personal goal setting, can help students move from a fixed mindset to a growth mindset and consequently improve their ability to learn.

These findings reinforce the importance of drawing meaning (Sousa, 1995) in the learning process and, as we have seen earlier in this document, highlight the importance of the TIM strategies for Heightening Anticipation; in particular, create the desire to know and give

purpose & motivation and for Extending the Learning; especially having a ball, singing in one's own key, and shaking hands with tomorrow.

The research so far has identified five potential mind-sets relating to learning the CPS process and tools:

- The growth mind-set (Dweck, 2006; Dweck, Chiu, & Hong, 1995; Yeager, & Dweck, 2012.)
- Affirmative judgment focused on "Yes, and …" rather than "No, but." (CEF 2015)
- Having a ball, singing in one's own key, and shaking hands with the future (Torrance, 1979; Torrance & Safter, 1990).

Based on my professional experience as a CPS practitioner, I would like to propose two additional mind-sets. Of the four core principles of CPS identified earlier in the document, I would argue that deferment of judgment is the most important. Without it the process of divergent thinking would be impossible, as would the ability to restate problems as questions in multiple ways, and the adoption of a "Yes and…" mind-set would be a non-starter. Because of its importance to the entire CPS process, I submit that deferment of judgment in addition to being a core principle is also a CPS mind-set.

The practical application of full CPS process (Creative Education Foundation, 2014) is a highly intuitive and iterative process, where the best way to learn is to practice using it. During practice many lessons will be learned, especially through mistakes, but mastery and confidence in the process will be acquired. This experiential learning process can be very daunting to novice leaners, and to overcome this they need to adopt the mind-set of trusting the tools and process.

Clustering and, where necessary, relabeling the mind-sets identified so far, the following seem to be the initial mind-sets that the layperson should strive to adopt:

- Growth mindset; create the desire to know linked to their purpose & motivation.
- Deferment of judgment; develop affirmative judgment and a tolerance for ambiguity.
- Trust the tools & process; make mistakes, learn and make it yours.
- Have a ball; take risks and have fun in the process.
- Shake hands with tomorrow; relate to your future career.

SECTION FIVE: Deliverables

TIM Re-Designed

The practitioners guide presented next was designed as a direct result of my research into how I might more effectively teach the CPS process and tools to an audience of laypeople. The overarching objective of this guide is to help me, as a practitioner, design and deliver a workshop focused on teaching the Creative Problem Solving process and tools in a manner that:

- Can be quickly be understood by an audience of laypeople.
- Demonstrates the value of the tools and process.
- Encourages the learner to start applying the tools and process immediately.

The practitioners guide uses the three-stage TIM as its fundamental framework and identifies specific goals, strategies and action items for each stage.

The overall content goals are stated up front in terms of tool-set, skill-set and mind-set. It should be noted that in an effort to support the process of making sense and drawing meaning for an audience of laypeople, the tool-set is limited to four fundamental elements and two divergent and convergent tools irrespective of the length of the initial learning episode. The level of skill-set to be taught however will be time dependent, starting with the three-stage process for shorter learning episodes, and expanding to the four-stage and eventually the full CPS process with more time that is available. Mind-set identifies the attitude and disposition that the learner should seek to develop to fully leverage the CPS process and tools.

Creative problem solving 101:
The fundamental tools and elements of the Creative Problems Solving process.
Practitioners Guide

Content Goal

- Teach the fundamental CPS tool-set.
  - Deferment of judgment.
  - Divergent thinking.
  - Convergent thinking.
  - The power of question and questioning.
- Develop introductory CPS skill-sets.
  - Start with the primary skill-set, the 3 stage CPS process.
  - If time is available, introduce the secondary skill-set, the Develop stage of the CPS process.
  - The tertiary skill-set would include the three-step Problem definition stage of the CPS process.
- Enhance the learner's mind-set towards the adoption and practical application of the CPS process and tools.
  - Growth mind-set; create the desire to know, linked to their purpose & motivation.
  - Deferment of judgment; develop affirmative judgment and a tolerance for ambiguity.
  - Trust the tools & process; make mistakes, learn and make it yours.
  - Have a ball; take risks and have fun in the process.
  - Shake hands with tomorrow; relate to your future career.

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Heightening Anticipation

Goals:

- Create a desire to learn about the CPS process and tools.

Strategy:

- Link the CPS process to something meaningful in their lives.

Action Items:

- When possible establish contact with participants electronically prior to the learning episode, and encourage them to engage in some pre-thinking about creativity and creative problem solving.
- Get the participants to focus on their motivation for attending the session and their individual ideal outcome.
  - Examples of questions that might be asked electronically are shown on page 1 & 2 of the users manual
- Should electronic contact prior to the learning episode not be possible, then alternative methods should be explored to heighten the anticipation, even if it is only for a couple of minutes prior the formal start of the session.
  - Engaging the learners at the last minute usually involves some type of fun or unusual activity like introducing themselves to other participants and asking them about their goals for the workshop.
- If time and circumstance permits, have the participants complete the paper version of the pre-event questions in the users manual.

Creative problem solving 101:
The fundamental tools and elements of the Creative Problems Solving process.
Practitioners Guide

Deepening Expectations

Goals:

- For the participants to learn and fully internalize the CPS process and tools.

Strategy:

- Help the participants draw personal meaning from the CPS process and tools

Action Items:

- To take advantage of the primary-recency effect, the material should be presented in twenty to twenty-five minute learning episodes; with approximately the first 10 to 15 minutes focused on the new teaching, followed by 5 to 7 minutes on practice, and finally 5 to 3 minutes on review and consolidation. This format will encourage the participants to make sense and attach meaning to the new learning, and will also support the strategies of distributed learning, transfer and varied practice, and in certain situations also that of interrupted learning.
- For a one-hour workshop this will results in two learning episodes. The first of which should be focused on the fundamental CPS tool-set and the second on the primary CPS skill-set. Underlying the entire workshop should be the awareness of the importance of mind-set over the entire CPS process, and where applicable mind-set should be discussed and reinforced during the entire learning experience. There are 5 minutes of leeway built around each learning episode for this purpose.
- For workshops longer than an hour, the additional time should be spent first on practicing applying the three-stage CPS process on a variety of challenges that have meaning to the learners. This interleaving and distributed learning process will most likely result in the transfer of the new knowledge into creative output, from which meaning will also be drawn.
- The unveiling and teaching of the four-stage and the full CPS processes should be done organically as and when the three and four stage processes reveal their limitations.

Watch Outs!

- Advance tool-sets, as well as tools and processes relating to mind-sets (metacognition and psychometric instruments) should be reserved for more advance classes or more experienced students of the CPS process and tools.

Creative problem solving 101:
The fundamental tools and elements of the Creative Problems Solving process.
Practitioners Guide

Extending the Learning

Goals:

- Reinforce the connection between the new learning and the participants' personal goals and motivation for attending the session.

Strategy:

- Encourage transfer through the practical application of the CPS process and tools.

Action Items:

- Since research shows that the greatest loss of newly acquired knowledge happens within eighteen to twenty-four hours of the learning episode, it is important that I follow up within that time frame and to encourage the learner to transform the new learning into creative output.
- My goal is to email the participants the following day:
  - Restating the key learning points from the workshop.
  - Emphasizing the importance of mind-set in the adoption and application of the tools and process.
  - Encouraging them to apply the CPS process and tools to everyday challenges that they may be facing, large and small.
  - Make them aware of other CPS related resources that are available to them, and encourage them to engage with each other and with others in the CPS community to continue their growth.

Users Manual

The users manual is an outline of the key takeaways for the learning episode, and is designed to ease the process of making sense and draw meaning for the participants. The material is presented in chunks of Tool-Set, Skill-Set and Mind-Set. Note that the manual presented next is the full version that would only be used when the full CPS process is being taught. For shorter sessions where fewer elements are taught the manual would be scaled back accordingly.

Every tool or process step is named at the top of the page followed by a brief description. It must be noted that all the tools described in the users manual can be found in the public domain and none are original to me. However, it is important to also point out that the CPS process and tools outlined in the users manual are based on and heavily influenced by the teachings of the Creative Education Foundation, which is where I received my formative training, and the International Center for Studies in Creativity where I continue to develop my knowledge and skills as a CPS practitioner. All of the process steps and tools listed in the Table of Contents should be immediately recognizable to experienced CPS practitioners, except for one. The name Stickystorming is a moniker that I have given to a widely used divergent process that utilizes Post-It notes, which does not seem to have found an appropriate name as yet.

The key takeaways are outlined on the left side of the page, starting with a description of why tool or process is relevant (making sense) followed by how it can be applied (drawing meaning). The right side of the page is the space in which the participants will be encouraged to capture their thoughts, ideas and insights from learning experience and to expand and personalize the key learning points.

The new learning will be presented in chunks the first ten to fifteen minutes of the learning episode, Prime-time-1, during which time the learner will be encouraged to expand his/her learning and capture his/her insights on the right side of the page for each tool and process step. Immediately after Prime-time-1, during Down-time, the participants will be invited to discuss and/or share their new learning and insights in pairs or small groups for approximately five to seven minutes. At the end of each chunk, Prime-time-2, I will restate the key learning points for each tool or process step and encourage the participants to capture what they just learned and how they intend to use through the So What tool. On the left side of the So What tool the learner will capture what they just learned and on the right how they are going to apply that learning, and in that process giving personal meaning to the new learning.

Creative Problem Solving 101:

The Fundamental Tools & Elements of the Creative Problems Solving Process

Users Manual

Presented by Glen Fayolle

Table of Contents

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30	☑ Problem Definition, Starting With a Problem	**Skill-Set**
31	☑ Applying Starting With a Problem	
32	☑ Problem Definition, Formulating the Problem	
33	☑ Applying Formulating the Problem	

Pre-Thinking

Welcome to creative problem solving 101, where our goal it to teach you the fundamental elements of the Creative Problem Solving process.

In an effort to maximize our time together, I would like to learn a little about you and invite you to engage in some pre-thinking ahead of the workshop. The questions below are simply meant to stimulate your thoughts and ideas on creativity, so have fun and challenge yourself as you take these first steps on this metacognition journey.

Please note that your answers to the questions below will be combined with those of the other participants and together they will inform and influence the final design of our workshop, however, rest assured that sources of individual answers will be kept completely confidential.

Expectations
What is creativity?
Why is learning about creative problem solving important?
What do you personally expect to get from this workshop?
What would the ideal outcome be for you at the end of this session?

Reflections
When are you at your most creative?

Reflections
What stimulates your creativity?
Please share an example of your creativity.

Challenges
How do you currently solve problems?
What do you need to become a more effective creative problem solver?
What challenge are your currently facing that requires a creative solution?

Different
What question did we forget to ask?
What is one question you wish we had asked?

Creativity

What is it and why is it important?

There are many definitions of creativity, but the one that seems to resonate with most is: **The production of novel & useful ideas.**

Key Learning Points	Insights
Why should I care? ☑ We all are born naturally creative, however, most of us have those creative juices squeezed out of us by the time we reach adulthood. ☑ The good news is that our natural creativity can be easily reignited.	
How can I put this into practice? ☑ The concepts presented here are really easy to understand, however, they can be quite difficult to put into practice. ☑ Regular practice in everyday situations will reignite your natural creativity. ☑ Don't be afraid to make mistakes, it is a great way to learn.	

The Fun 4

What are they?

These are the four fundamental building blocks of creativity and creative problem solving.

Key Learning Points	Insights
Why should I care? ☑ These are elements specific to the domain of creativity and creative problem solving. 1. Defer judgment 2. Diverge 3. Converge 4. Problems as questions ☑ Putting these elements into practice will greatly improve your individual creativity, and your ability to solve problems in a creative manner.	
How can I put this into practice? ☑ Don't just learn these elements, make them part of your creative mind-set. ☑ Practice using the elements in everyday situations.	

The Fun 4 - Defer Judgement

What is it?

The ability to let go of all preconceived knowledge and experience.

Key Learning Points	Insights
Why should I care? ☑ Creativity requires a lot of new and especially different ideas. ☑ New ideas (including yours) are at their most vulnerable when they first emerge. ☑ New ideas need time & space to grow in order to show their full potential. ☑ Without this fundamental element, creativity is practically impossible.	
How can I put this into practice? ☑ When you see or hear something new and/ or different, start by saying & thinking "that is interesting" then just let it be. Don't try to determine if the idea is either good or bad. ☑ When someone is presenting a new idea to you, ask plenty of empowering questions; - Tell me more about that? - How would you make that work? ☑ Focus on being affirmative, use "Yes and,,," rather than "No, but." ☑ Deferring judgement does not mean that you will not make a decision later, it simply means that you are deferring judgement for the moment to give the idea time to show its full promise.	

The Fun 4 - Diverge

What is it?

The ability to open up to all the possibilities, ideas, perspectives and solutions.

Key Learning Points	Insights
Why should I care? ☑ Divergent thinking is the most effective way to think beyond your normal frame of reference and to generate new and different possibilities. ☑ Your first ideas are unlikely to be your best ones. ☑ Before being able to decide which is your best option, you first need to identify all your options.	
How can I put this into practice? ☑ Use the divergent thinking guidelines: • Defer judgement • Strive for quantity • Seek wild and unusual ideas • Build on other ideas ☑ Capture your ideas as soon as they hit you.	

The Fun 4 - Converge

What is it?

Analytical thinking. Focusing ideas down into manageable pieces.

Key Learning Points	Insights
Why should I care? ☑ This element turns your ideas into workable pieces or solutions. ☑ Even your craziest ideas might result in breakthrough solutions.	
How can I put this into practice? ☑ Use the convergent thinking guidelines: • Apply affirmative judgement • Be deliberate • Check your objectives • Combine ideas • Consider novelty	

The Fun 4 - Problems as Questions

What is it?

Restating your problems or challenges as empowering questions.

Key Learning Points	Insights
Why should I care? ☑ The questions you ask determine the solutions you get. ☑ By reframing your problem or challenge into an empowering question you drastically increase your odds of finding empowering solutions faster.	
How can I put this into practice? ☑ Use empowering stems to your questions: - How might I …. - In what ways might I …. - Wouldn't it be great if ….	

So What?

What Have I Learned	How I Will Use It

The Creative Problem Solving Process (CPS)

What is it?

A deliberate creative problem solving process.

Key Learning Points	Insights
Why should I care? ☑ You are already using various aspects of this process. The CPS process simply adds structure to what you are already doing. ☑ The process will provide you with a simple and highly effective methodology to make you a much more effective problem solver.	
How can I put this into practice? ☑ Start using the 3 stage CPS process in everyday situations. ☑ This is an iterative process where it is perfectly acceptable to go back and forth and even start over again, so play around with the different phases of the process and have fun. ☑ Make mistakes, but keep learning and make the process yours.	

CPS - Problem Definition

What is it?

The process of clearly defining the core problem.

Key Learning Points	Insights
Why should I care? ☑ This is the most important stage in the CPS process. ☑ Most problem solving processes fail because not enough time and effort is spent on this stage.	
How can I put this into practice? **Diverge** ☑ Use any root cause analysis tool. ☑ Make sure to identify all the relevant information about the challenge, facts and feelings.	
Converge ☑ Select the most prominent pieces of information. Cluster similar elements together and identify overarching themes and challenges, then rank and test them.	

CPS - Idea Generation

What is it?

The generation and selection of ideas to solve the challenge.

Key Learning Points	Insights
Why should I care? ☑ This is usually the most energizing and fun part of the entire process. ☑ This is where you can let your imagination run wild.	
How can I put this into practice? **Diverge** ☑ Use any divergent tool or process to generate as many ideas as possible. ☑ Be very mindful of using the divergent thinking guidelines.	
Converge ☑ Use any convergent tool or process to select and boil the ideas down into more manageable pieces. ☑ Be very mindful of using the convergent thinking guidelines.	

CPS - Implementation

What is it?

The process for turning ideas into workable solutions.

Key Learning Points	Insights
Why should I care? ☑ This is where you turn your ideas into practical solutions. ☑ This will be your detailed action plan on how to move forward.	
How can I put this into practice? **Diverge** ☑ Identify all the steps that need to be taken to implement your ideas. **Converge** ☑ Put a detailed chronological plan in place that identifies, what, where & how things will be done, and also by whom & when.	

So What?

What Have I Learned	How I Will Use It

Brainstorming

What is it?

It is a high energy, verbal process for generating ideas.

This tool can be used at any divergent stage of the CPS process.

Description of Process

- Write the challenge statement so that it is visible to the resource group.
- Teach or remind the resource group the guidelines for divergent thinking.
- Instruct the resource group to headline their ideas to ease the capturing process.
- Encourage the resource group to call out their ideas as soon as they have them. Calling out ideas immediately:

  Helps with the process of deferring judgement.

  Will trigger more ideas from the other participants.
- Capture all the ideas so that they are visible to the resource group.

Pluses	Minuses
☑ High energy process that can generate a lot of ideas in a very short time.	☑ The process does not always fully engage everyone in the resource group.
☑ Can be a lot of fun with the right group of people.	☑ Process is limited by the abilities of the scribe to capture the ideas.
☑ Appeals to and energizes individuals with extraverted preferences.	☑ Scribe often has to short hand the ideas during the writing process.
☑ Promotes open group collaboration.	

Tip

Definitely use this tool if you know that the majority of your resource group have a preference for extraversion.

Having a second facilitator help with the scribing process will really turbo charge the process.

Stickystorming

What is it?

It is a medium energy, verbal and non-verbal process for generating ideas.

This tool can be used at any divergent stage of the CPS process.

Description of Process

- Write the challenge statement so that it is visible to the resource group.
- Teach or remind the resource group the guidelines for divergent thinking.
- Instruct the resource group to headline and write their ideas legibly on Post-It notes.

  Emphasize that it should be only one idea per Post-It note.
- Encourage the resource group to first capture their ideas on the Post-Its as soon as they have them, before calling them out.

  The process of capturing on Post-Its first gives time and space for those with introverted preferences to process and generate ideas.

  The calling out process energizes and engages those with an extraverted preference.

  The calling out process should trigger more ideas from other participants.
- Capture all the Post-Its, including duplicate ideas, so that they are visible to the resource group.

Pluses	Minuses
☑ This is a “simmering” process that can generate a lot of ideas. ☑ Engages everyone in the resource group. ☑ Process is not limited on the abilities of the scribe to capture the ideas. ☑ All the ideas are captured intact. ☑ Appeals to and energizes individuals with an introverted preferences.	☑ This process can take a while to get going. ☑ This process is not very appealing to individuals with an extroverted preference.

Pro Tip

After staging the challenge at the start of the process, give the participants sufficient time to capture their ideas on Post-Its before asking them to call the ideas out.

Hits

What is it?

This is a process of quickly focusing on the most pertinent ideas.

This tool can be used at any convergent stage of the CPS process.

Description of Process - Resource Group

- Give each member of the resource group the same number of dots, which they will use to identify the most promising ideas. Each dot is called a hit.
- Teach or remind the resource group the guidelines for convergent thinking.
- Instruct the resource group to hit the ideas that they believe hold the most promise.
- Ideas with the most hits should be worked on first.

Pluses	Minuses
☑ This process engages the entire group.	☑ If not administered correctly, this process can lead to group think.

Pro Tip

Using dots with a whole resource group is a three step process;

1. Ask the participants to make a mental selection of the most promising ideas.
2. With dots in hand, ask the entire group to stand as close as possible to where the ideas are displayed.
3. Encourage them to all vote at the same time, or in the shortest possible time frame.

Description of Process - Client Only

- This process can also be done with the only the client making the hits. The process is exactly the same, except that the client can use as many dots as needed or a marker pen.

Pluses	Minuses
☑ The client can really focus on the ideas that are important to him/her.	☑ The resource group in not involved in the convergence process.

Clustering

What is it?

This is a process of converging all the ideas into the most pertinent areas of interest.

This tool can be used at any convergent stage of the CPS process.

Description of Process

- Start with a converge team made of two or three members of the resource group selected at random.
- Teach or remind the converge team of the guidelines for convergent thinking.
- Instruct the converge team to group the all of the ideas generated on Post-Its into clusters with similar themes.
- The clusters should be labeled.
- The clusters should finally be ranked in order of importance.

Pluses	Minuses
☑ All the ideas generated are use in this process. ☑ Every member of the resource group has the opportunity to take part in this process at the various convergent stages of the CPS process. ☑ The Post-Its make the convergent process really easy.	☑ This process can only be used in conjunction with Sticky Storming.

Pro Tip

Share this process with the client prior to using this tool. Let the client know that he or she can participate in this process at any time with other members of the resource group, but point out that having members of the group drive this part of the process really helps with the buy-in for the final output.

So What?

What Have I Learned	How I Will Use It

Applying The CPS Process

Problem Definition	
Start with the problem statement, using: ☑ I wish (IW…) or ☑ Wouldn't it be great if (WIBGI…)	
Diverge Identify the data, facts and feelings	
Converge Select the most important data.	
Restate your problem statement as a positive challenge, using how might I (HMI…)	

Applying The CPS Process

Idea Generation

Diverge

Generate as many ideas as you can on how to solve your problem.

- Divergent thinking guidelines:
  - Defer judgement
  - Strive for quantity
  - Seek wild and unusual ideas
  - Build on other ideas
- Capture all your ideas as soon as you get them.

Converge

Focus your ideas down into more manageable pieces.

- Convergent thinking guidelines:
  - Apply affirmative judgement
  - Be deliberate
  - Check your objectives
  - Combine ideas
  - Consider novelty

Applying The CPS Process

Implementation			
Diverge Identify all the steps needed to turn your ideas into workable solutions.			
Converge Convert your steps into an action plan.	**Action Item**	**By Whom**	**By When**

So What?

What Have I Learned	How I Will Use It

Warning!

Please do not proceed until your are completely familiar and comfortable with the tools and 3 stage CPS process identified so far.

Proceeding beyond this point without this level of comfort and familiarity may result in utter confusion and frustration.

CPS - Idea Development

What is it?

The process for turning your crazy or half-baked ideas into workable solutions.

Key Learning Points	Insights
Why should I care?	
☑ Ideas coming out of the idea generation stage generally fall into three categories. - Those that are straight forward and just need to be implemented. - Those that have to be implemented in a certain order so they need to be planned out. - Those that need to be developed further because they are still half-baked. ☑ This is where those half-baked ideas get some more creative kneading.	
How can I put this into practice?	
Converge ☑ Since these ideas will not work in their raw form, first you have to identify the essence of these ideas that makes them interesting.	
Diverge ☑ How might you adapt, modify or combine the essence of these ideas with other ideas or concepts to make it work?	
Converge ☑ Boil the ideas down into more manageable pieces.	

Applying The CPS Process

Idea Development

Converge

Identify the essence of the idea that makes it appealing or interesting Even the craziest ideas have some value, the key is to first identify what that value is.

Diverge

Generate ways to leverage the essence of the idea, in combination with other ideas to generate more ideas and concepts.

Converge

Focus your ideas down into manageable pieces. If the ideas still needs more work, move back up to the first step of this development stage to make sure that you have identified the true essence of the idea, and repeat the process.

Converge

When you get to an idea that seems workable, move it to the implementation stage of the process.

Proceed With Caution!

Proceed only when you are completely familiar and comfortable with the tools and 4 stage CPS process identified so far. Proceeding beyond this point without this level of comfort and familiarity may result in utter confusion and frustration.

- If you are starting with a wish go to page 28
- If you are starting with a problem go to page 30

CPS - Problem Definition - Starting With A Wish

What is it?

The process of clarifying where we might want to focus our creative energy.

Key Learning Points	Insights
Why should I care? ☑ This is an invitation to create a new and better future.	
How can I put this into practice? **Diverge** ☑ Generate as many wishes as you can, using positive stems: - I wish …. - Wouldn't be great if ….	
Converge ☑ Select the wishes that are the most appealing to you, or have the most promise.	

Applying The CPS Process

Problem Definition - Starting With A Wish

Diverge

Generate as many wish statements as possible, using positive stems:

- I wish ….
- Wouldn't be great if …

- ☑ Focus on your goals, aspirations and dreams.
- ☑ What are some of the challenges that you are facing?
- ☑ What would you like to do differently?
- ☑ Imagine yourself in the future.

Converge

Review and select the wishes that:

- ☑ Are **important** to you.
- ☑ Over which you might have **influence.**
- ☑ Need new **ideas.**

Converge

Restate your wishes using a positive stem.

Select one that you would like to explore further.

CPS - Problem Definition - Starting With A Problem

What is it?

The process of clearly identifying all the elements of the problem.

Key Learning Points	Insights
Why should I care? ☑ This is a very important step in the CPS process. ☑ The tendency is to solve the immediate problem, which may be a symptom rather that the root cause of the problem.	
How can I put this into practice? **Diverge** ☑ Generate all the data surrounding the challenge, facts and feelings.	
Converge ☑ Review and select the most important data.	

Applying The CPS Process

Problem Definition - StartingWith A Problem

Diverge

Generate all the data around the challenge, facts and feelings.

- ☑ What is the history of this problem?
- ☑ What has already been tried?
- ☑ Who is involved?
- ☑ How much is it costing?
- ☑ What does your gut tell you?
- ☑ How are you going to measure success?
- ☑ What is stopping you?

Converge

Review and select the most important data.

- ☑ Cluster and label.

CPS - Problem Definition - Formulating The Problem

What is it?

The process of clearly identifying the core of a problem and stating it in a manner that invites solutions.

Key Learning Points	Insights
Why should I care? ☑ This is the most important step in the CPS process. ☑ A problem well-stated is a problem half-solved. Charles Kettering ☑ Time, energy and effort spent on the symptoms rather than on the core of a problem is pure waste.	
How can I put this into practice? **Diverge** ☑ Restate the problem is as many ways as possible using positive stems: - How might we / I …. - In what way might we / I…. - How to …. **Converge** ☑ Select the statement that is the most appealing to you, or has the most promise.	

Applying The CPS Process

Problem Definition - Formulating The Problem

Diverge

Restate key data about the problem as positive questions that invite solutions.

- Use positive stems:
  - How might I ….
  - In what way might I….
  - How to ….
- Rephrase the barriers, challenges, and opportunities.
- Phrase the problem from different perspectives.

Converge

Review and select the wishes that:

- Are **important** to you.
- Over which you might have **influence.**
- Need new **ideas.**

Converge

If needed, restate your problem using positive stems.

Select one that you would like to explore further.

So What?

What Have I Learned	How I Will Use It

Reflections

I now realize that my focus when teaching the CPS tools and process prior to undertaking this project was mainly on sharing knowledge of Tool-set and Skill-set, with very little attention on Mind-set. My primary take away from this project is that without a shift in Mind-set, it is unlikely that the learner will apply the tool or skill post workshop. Engaging the learner prior and post workshop are key elements in facilitating the Mind-set shift, which I hope to achieve by using the TIM strategies of giving purpose and motivation to heighten the learner's anticipation, and that of shaking hands with tomorrow to extend the learning into the practical application of the tools and process post workshop.

Based on my new knowledge of the chunking process and the primary-recency effect, I will also significantly change how I teach the CPS tools and process in the future. My plan is to deepen the expectations of the learner by delivering the new materials in chunks of the smallest amount of Tool-set or Skill-set that have the most meaning for the student, at intervals when the learner is the most receptive according to the primary-recency effect. This is a significant Mind-set shift for me, as in the past I was focused on ensuring that I always delivered the entire CPS process together with as many tools as I could cram in the time available.

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