

Divergent Problem Solving as a Process



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An Experiment in Progress

Problem Solving as a Process

How Teaching a Structured Thinking Process Improved Productivity, Innovation, Culture, and Employee Satisfaction at DPS Telecom

An Experiment in Progress

The 3 Big Ideas

1. When a skill or activity is described as “Magic” or “Art”, that is an indication of an **undefined process**
2. Soft things like problem solving, and creativity are processes - *which means they can be defined and they can be taught*
3. **A Process = Predictable Results**



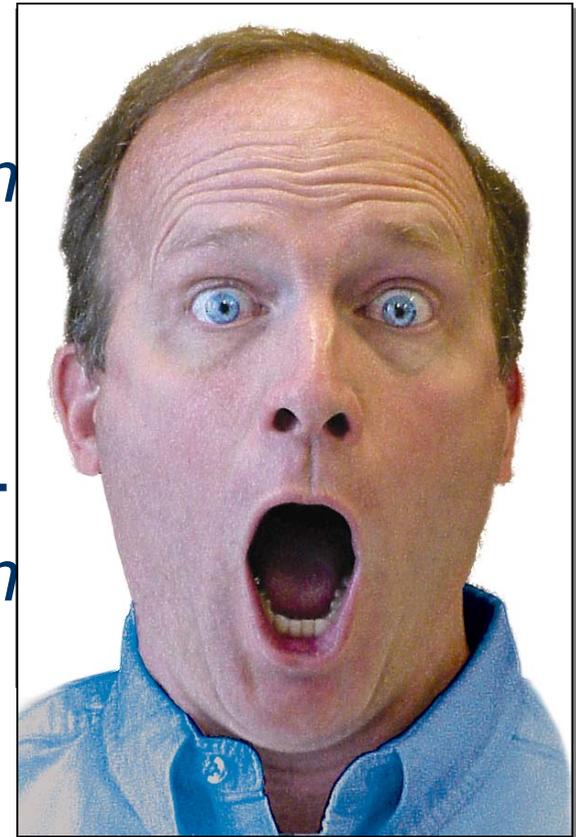
It Began as a Tool for Engineering

- Engineering had a problem that “couldn’t be fixed”
- Gathered group together to review where they were
- Just because they are really smart – does not mean they have structured problem solving skills



How did I get there?

- It is a great feeling when...
*you are the **only one** who can innovate and solve big problems!*
- It is a horrible realization when...
*you are the **only one** who can innovate and solve big problems!*



How Do I Fix This?

- I asked myself – “What did I do to solve this?”
- I made a list of the steps I took to solve the problem
- I realized that I had a process

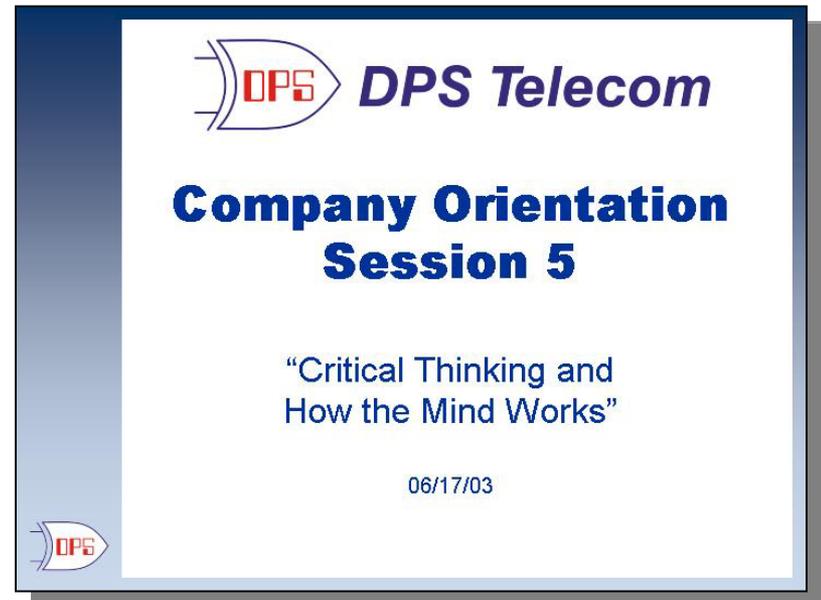
and then it hit me...



***We train for physical processes,
why not for thinking and problem solving?***

Phase 1: A New Training Program

- I defined a program for critical and creative thinking concepts
- I added it to the standard new employee orientation training program
- I took the material on tour through all departments



New Employee Orientation Module

It Was Big!

Critical Thinking Training Program

Overview: Problem Solving and Creative Thinking

1. It Must Be Learned
2. How the Mind Works
3. Bias
4. Rationalization & Lazy/Fuzzy Thinking
5. The Power of Optimism
6. Why Thinking is Important
7. Analysis vs. Discussion
8. Divergent vs. Convergent Thinking
9. The DPS Thinking Toolkit

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It Must Be Learned

Logical Thinking:

- A right answer
- Timed test
- Easier to measure and compare
- Reaction based

Creative Thinking

- Is there really a problem?
- A lot of potential answers
- A lot of potential action plans
- Results can be tailored to needs
- Requires tools & techniques that are "different"
- Can be easily misused and regarded as "pointless"



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The Amazing Tool that Everyone Has

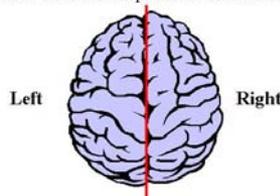
- Millions of dollars are spent every year in an attempt to recreate the capabilities of the human mind.
- Most of our "Thinking" takes place in the subconscious mind in ways that we are not aware of.



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Left Brain, Right Brain Function Separations

- The left side of the brain performs the logical, mathematical and reasoning functions
- The right side of the brain performs the creative functions.



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Ability to Focus and Concentrate

- Music has an effect on our ability to concentrate

- If silence is the 0% norm:
 1. Music with words is -10%
 2. Music without words is +15%

- This is because music stimulates neurons in the right side of the brain while words stimulate the logical left side of the brain.

At first, music without words will cause a lot of people to become sleepy – this is a result of several factors:

1. Not used to creative internal thinking – need external stimulus.
2. Not used to focusing.
3. Quiet time is reserved for falling asleep.



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Bias – when it is good

Bias: An unconscious belief that conditions, governs, and compels our behavior.

- Biases are not all bad – we would be dysfunctional without them!
- They enable us to repeat an action we have taken before without going through all of the mental steps that led to the original act.
- They enable us to process new information extremely rapidly by taking mental shortcuts.

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It Was Full of Tools...

Critical Thinking Training Program

Bias – when it gets in the way

- They are the unseen killers of objective truth.
 - We give high value to new information that is consistent with our biases at the expense of truth
 - We give low value, even reject, new information that is inconsistent with our biases – thus preserving them.
 - Most biases are hidden from our consciousness so we are not aware of their effects, good or bad, on our analysis, conclusions, and recommendations.

"It's not what I don't know that scares me, it's what I know that just ain't so." – Roy Rogers

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Rationalization & Fuzzy Thinking

- We trust evidence that supports our judgments and throw out evidence that does not.
- This is lazy thinking. We must challenge our biases and previous experiences.
- Rationalization statements:
 - "I've seen that before"
 - "I've already tried that."
 - "It can't be done"
 - "I know a better way"
 - "Just because it's different doesn't make it better"

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The Power of Optimism

The Giddy Optimist

- Assumption: Everything will go right
- Sees himself skipping across the finish line pretty and smiling
- Reality: Not everything goes right
- Usually makes a single path plan.
- Perceives unforeseen problems as fatal, heart wrenching and totally self-defeating – caught off guard and stunned. Not sure what to do next.
- Easily disillusioned



The Empowered Optimist

- Not everything goes wrong.
- Sees himself as a bloody action hero staggering across the finish line – the bad guys are all dead – He wins.
- Makes lots of contingency plans.
- Has thought of what might go wrong.
- Assumes things will go wrong & is prepared to create new plans.
- Views obstacles & problems as tests to be passed.
- Question: How is this different from pessimism?



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Why is Thinking Important?

- Thinking creates options for achieving desired results.
- Planning organizes options for achieving desired results.
- Success executes plans until you achieve desired results.
- Analysis learns what happened during execution to improve your thinking and planning to ultimately be way more successful.



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Discussing a Problem

- Talking about a problem is NOT the same as analyzing a problem.
 - What most people call analysis is simply talking about a problem "really hard." They say what happened, why it's not their fault, why they can't guarantee it won't happen again, and maybe why it is that other guy's fault.



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Analyzing a Problem

- Analysis focuses on:
 - The process involved
 - Describing the problem
 - Identifying what solutions would look like
 - Identifying root causes of the problem
 - Plans to collect data
 - Metrics to track processes
 - Plans to measure problem, solve the problem, and learn from the results going forward
- The neat thing about analysis is that the focus is SOLVING PROBLEMS, not assigning blame.

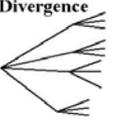
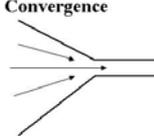


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You Could Solve Anything...

Critical Thinking Training Program

The Divergent vs. Convergent Process

<p>Divergence</p>  <ul style="list-style-type: none"> ▪ Create lots of alternatives ▪ Different points of view ▪ Different methods and approaches ▪ Different outcomes and results 	<p>Convergence</p>  <ul style="list-style-type: none"> ▪ Sort through the alternatives ▪ Pick a handful of the best ▪ Develop them further
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Several rounds of divergent – convergent thinking will produce some highly effective ideas and approaches.

The DPS Thinking Toolkit

The best way to get a good idea is to first get a lot of ideas...

First you need a tool kit:

1. Mindset
2. Notebook
3. List of Questions
4. Mentors
5. Books

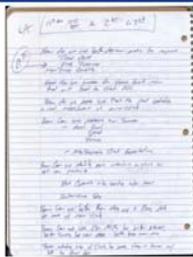


Mindset

1. "I'm creative, I have expertise, and I want solutions."
2. Don't worry about rules, practicality, or foolishness during the idea phase.
3. Don't worry about being wrong – don't even worry about being vague.
4. *"The quality of your life will be determined by the quantity, not the quality, of your thinking."*

Note Book Methods

- List making and problem solving
- Index Methods
- Mini-diary
- To do lists
- Phone numbers and important dates
- Calendar in the back



Lists of Questions - an aide for divergent thinking

- This is how you dimensionalize a problem
 - List all of the possible questions
 - What are the outcomes?
 - What's missing?
 - What does a solution look like?
 - What might go wrong?
 - What are the signs to decide when you are in trouble?
 - What are the major events and timeline?
 - Etc...
 - Change your perspective – How many different ways can I look at this problem?

Explain a problem verbally to a friend

- Have you ever had a problem and when you went to explain it to someone else, you realized the solution in the middle of your explanation!
- Why is this?
 1. You're describing the problem instead of trying to solve it
 2. Different areas of your brain are stimulated

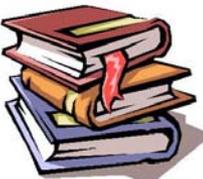


It Wowed Everybody!

Critical Thinking Training Program

Books

- Take advantage of the 1000s of man-years of experience found in books.
- Don't think you can figure it all out yourself.
- Try to shorten your learning curve.



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Mentors

- Be open to feedback from those with experience.
- Experience will always trump brains.
- Seek out people who can guide you and give you greater visibility of your problem.



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Critical and Creative Thinking Summary

1. It Must Be Learned
2. How the Mind Works
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Workshop: What areas can I apply these tools and concepts this week?

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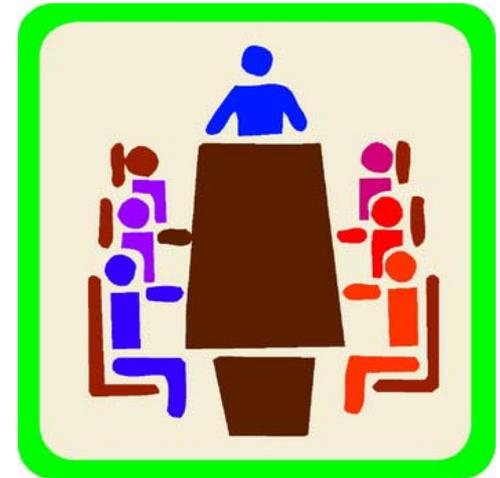
But Not a Whole Lot Changed!

- Some things did stick:
 - Notebook methods
 - Use of printable white boards for WSWS and group think
 - Attitude towards problem solving
 - Use of question lists to stimulate divergent thinking and create actionable ideas



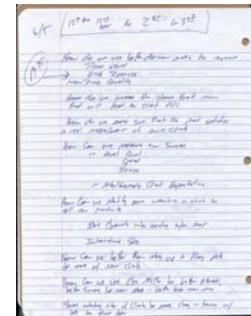
Phase II Plan

- Narrowed down on the tools
- Focused on just the managers and key staff
- Enlisted their help in designing the program
- We emphasized doing 10 things 400 times, rather than 400 things 10 times



The Phase II Program

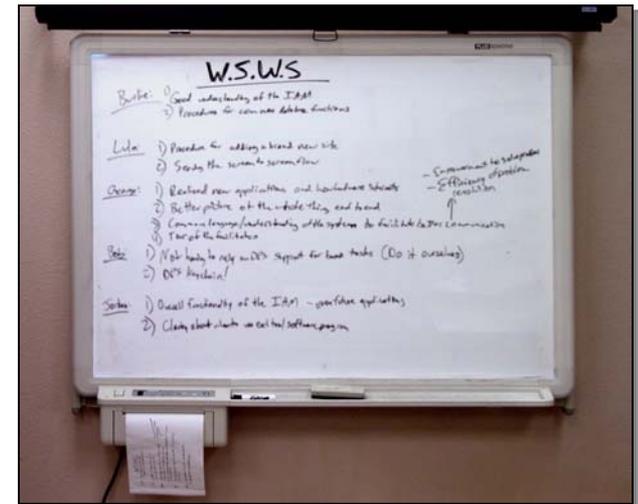
- Printable white boards for W.S.W.S. and group think
- Notebooks – common “DPS Way” method and format
- Weekly think time and think groups
- Collect best practices after every project
- Questions workshops – stimulates divergent thinking
- Strategy vs. Tactics workshops





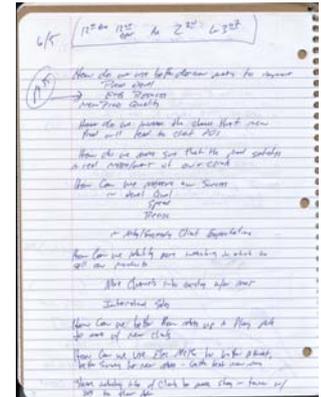
Printable White Boards for WSWS

- Provides outlet for venting
- Encourages participation from everyone
- The power of “He who holds the pen...”
- No random discussion only by most vocal members – everyone gets a turn
- Group votes & prioritizes list creating “buy in”
- Every meeting creates an actionable outcome



Notebooks – common “DPS Way” method and format

- Index up front for major events
- Heavy duty, full size (8.5” x 11”)
- Name and contact in front, calendar in back
- Place to capture and reuse notes and ideas
- Reinforces conversations and memory
- Standard place to:
 - Frame questions for problem solving
 - Schedule work and time management
 - Master To-Do lists
 - “Notethink” sessions and free form topical essays



Weekly Think Time

- Must be away from the office and computer
- Set your weekly goals:
 - Allows you to be proactive instead of reactive
 - List of questions, topics, or issues
 - Review last session's items
- Leave plenty of white space so you can go back and add – paper is cheap
- Use it to make you more effective. It's not a diary, it's not a work of art
- Write it down! Slow down and collect your thoughts



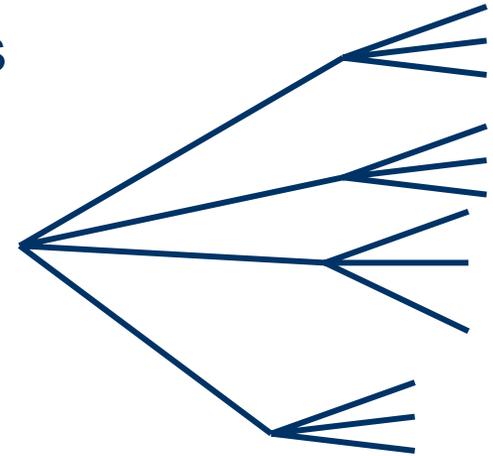
Collect Best Practices

- Post-mortem meeting immediately after project or event:
 - What did we do well?
 - What went wrong?
 - What would we do differently?
 - Lessons Learned?
- Convert workshop output into policies, plans, and procedures



Creating Solution Options (Divergent Thinking)

- Brainstorm multiple investigation paths (as many as you can develop)
- Rephrase the problem – Look for different angles and combinations
- Key questions:
 - What could go wrong?
 - What do I have / What am I missing?
 - What would I need to know?
 - What would Bob ask? He want? He do?
- Never get to the bottom of your list - if you're getting close, STOP and create some more options.





Strategy vs Tactics



- Day to day tactics change regularly
- The ultimate goal and the strategies to achieve it rarely change
- Explains why employees believe that management changes their mind all the time, they don't understand the difference



Phase 2 Outcomes

- Managers latched onto idea that they need thinking time to work ON the business, not just IN the business
- Fast and effective communication between team members and other departments
- Helps eliminate people feeling personally hit for things going wrong.
- Helps focus people on solving problems, not making excuses
- Problems that previously required my total involvement were able to be solved by my managers.



The Overall Impact on DPS Telecom

- The culture is becoming more and more results oriented
- Problems and opportunities are attacked with enthusiasm and
A PROCESS! = Predictable Results
- Fast, effective, fluent communications
- Continuous improvement and best practices reporting has become a standard process, not the exception



Personal Lessons Learned

- Any process can be taught
- Mastery comes from repetition
- The impact is higher if they help design the programs
- Rockefeller Habits workshop: CEOs are seen as Superman, you need other respected champions.
- Make regular time to work ON the business, not just IN the business
- Wherever you see something described as “art”, it means an undefined process



“He will win whose army is animated with the same spirit”

- *Sun Tzu, Art of War*

Q & A

- Resources:

- Printable white boards: www.plus-america.com
- Personality profiling: www.jobmatching.com
- Critical thinking and problem solving books:
 - [The Thinker's Toolkit : 14 Powerful Techniques for Problem Solving](#)
 - [101 Creative Problem Solving Techniques: The Handbook of New Ideas for Business](#)
 - [PhotoReading Whole Mind System](#)
- Any questions?
Email me at Bob@askBobBerry.com