CREATIVE THINKING AND PROBLEM SOLVING

DESCRIPTION:
Problem solving has traditionally focused on constraining human behaviors to optimize system performance, but inhibiting behavior has the unwanted side effect of inhibiting creativity and innovation as well. In today’s complex and ever-changing environment, stifling creativity and innovation are dangerous strategies. Creative Problem Solving will explore methods for solving problems with creativity while accounting for human limitations and explore reasons that innovation can be challenging. Methods for stimulating new ideas while maintaining order and stability in the laboratory setting will be presented. Cycles of innovation and stabilization, carried forward by inspired staff members, will be key to surviving in the current healthcare environment.

OBJECTIVES:
At the conclusion of this presentation, the participant will:
• Discuss problem solving skills
• Describe methods for creative problem solving
• Apply methods of creative problem solving to the laboratory environment
Creative Thinking and Problem Solving

Michele Fisher
MT(ASCP)
ASQ Certified Six Sigma Green Belt
Improvement Specialist III
The ones who are crazy enough to think that they can change the world, are the ones who do

-Steve Jobs
Can you reprogram her?
A problem of quality...

suppression of creativity & innovation
I am a surgeon who studies creativity, and I have never had a patient tell me that "I really want you to be creative during surgery" - Charles Limb
quality assurance

stabilizing

process improvement

disruptive

By Frits Ahlefeldt
Analytical thinking
Analyze the Problem

3 easy steps!

Identify the problem

Clarify it

Find the cause
Identify the problem and goal
possibilities

To desire

From discontent

options

what are we looking at?
what risk is there?
What risk in NOT doing?

choose

resources
support
Goals

By Frits Ahlefeldt
Clarify the problem

Remember: We don't have problems, only challenges...

By Frits Ahlefeldt
“If I had one hour to save the world, I would spend 55 minutes defining the problem and only five minutes finding the solution”

Dr. Albert Einstein
Theoretical physicist
1879 - 1955
never accept that the current reality is the only reality
understand the magnitude of the problem
don’t assume that what you are told about the problem is true
recognize that things change with time
clearly understand what is known and what is not known; eliminate ambiguity
act on what actually is, rather than on what you believe is true
pay attention to things that “don’t matter”

Shigeo Shingo
Problem statement

Employees are expected to process between 10 and 15 samples per hour. During the period in which increased errors occurred, the average number a samples processed for all employees on the shift was 7.5 samples per hour.

The employees on this shift are idle.
Kit inventory is 0% accurate electronically, occupies 2 rolling shelves of space, and takes over 4 minutes to retrieve supplies causing supply ordering errors and delays in testing.

Kit inventory is problematic.
Find the cause
Question everything

Are you with us or against us?

By HikingArtist.com
The Five “Why?”s
Warning!

HikingArtist.com
### System Factors

<table>
<thead>
<tr>
<th>Factor</th>
<th>Influence</th>
<th>Ask</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Institutional</strong></td>
<td>Economics</td>
<td>Were pressures in the market or new regulatory requirements a factor?</td>
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<tr>
<td></td>
<td>Cultural</td>
<td>Are there other external influences?</td>
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<tr>
<td></td>
<td>Regulatory</td>
<td></td>
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<tr>
<td><strong>Organizational Senior</strong></td>
<td>Organizational structure</td>
<td>Is there a culture that increases non-standardization, poor work or safety habits?</td>
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<tr>
<td>Management</td>
<td>Policy standards, communication</td>
<td></td>
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<tr>
<td></td>
<td>Safety &amp; risk culture/priorities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Finances</td>
<td>Is executive/manager support sufficient?</td>
</tr>
<tr>
<td><strong>Work Environment</strong></td>
<td>Staffing, skills mix</td>
<td>Does workload correlate with adequate staffing?</td>
</tr>
<tr>
<td></td>
<td>Workload, shift patterns</td>
<td>Was design or adequacy of the environment or operation of equipment a factor?</td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Administrative/manager support</td>
<td></td>
</tr>
<tr>
<td><strong>Team/Unit</strong></td>
<td>Communication written &amp; verbal</td>
<td>Was communication or lack of information involved (i.e. unclear, too late)?</td>
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<tr>
<td></td>
<td>Team leadership</td>
<td>Did interactions influence performance?</td>
</tr>
<tr>
<td></td>
<td>Team structure/dynamics</td>
<td>Is decision support available?</td>
</tr>
<tr>
<td><strong>Individual</strong></td>
<td>Knowledge, skills, competence</td>
<td>Were issues of staff training/competency a factor?</td>
</tr>
<tr>
<td></td>
<td>Decision making</td>
<td>Is situational awareness a needed skill?</td>
</tr>
<tr>
<td></td>
<td>Physical, mental health condition</td>
<td>Is fatigue or workload a factor?</td>
</tr>
<tr>
<td><strong>Task</strong></td>
<td>Design and clarity</td>
<td>Were appropriate rules/procedures – or the lack thereof a factor?</td>
</tr>
<tr>
<td></td>
<td>Protocol accessibility</td>
<td>Are instructions clear?</td>
</tr>
<tr>
<td></td>
<td>Test result accuracy/accessibility</td>
<td></td>
</tr>
<tr>
<td><strong>Customer/Patient</strong></td>
<td>Complexity, seriousness of condition</td>
<td>Was there a lack of understanding with the recipient?</td>
</tr>
<tr>
<td></td>
<td>Communication barriers</td>
<td>Were unclear expectations a factor?</td>
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<tr>
<td></td>
<td>Personality and social issues</td>
<td></td>
</tr>
</tbody>
</table>
Degree of change

Established Path

Creative Path
Creativity

- Identify Solutions of Value

Innovation

- Putting those ideas into practice
Laughter

https://youtu.be/bFEvm336Znc
Missing the meaningful
Enabling creative thinking

- Global Brain Connectivity
- Visualization Training
- Brain Plasticity
Suspending judgment

“Are we in the right”  ➔  “Are we being effective”
Creative Thinking

• *generate* totally *new* ideas (lateral/linear techniques)

• *synthesize* from *past* experiences (intuitive techniques)
“Maybe, maybe not…”

“Elementary, my dear Watson”

“Give me numbers”

“Riddikulus”

“Attention!”

“I am delighted with that”
Creative Thinking Methods
(lateral/linear techniques)

- Alternatives
- Change Focus
- Random Entry
- Reversing
- Provocation
- Brainswarming
Generating Alternatives
Changing Focus

By Frits Ahlefeldt
Automated Specimen Tray Tower

- keep bench top clear
- move trays from processing to check-in
- utilize vertical space
Connect With Random Entry

Problem: How can I motivate my team?

Bird…
Binoculars
Robin
Chatter
Sounds

Binoculars…How can I motivate my team?
Binoculars…Eyes…Glasses…Reimbursement for Glasses
Binoculars…Sight…Google glasses…Relaxation rooms
Binoculars…Telescope…Observatory nearby…Local field trips
Reversing/Provocation
**Brainstorming**

- Dominance
- Skeptics
- Idea conformity
- Capturing ideas
- Time consuming

**Brainswarming**

- Silence
- Independent work
- Hitchhiking/new connections
- Top-down/bottom-up thinkers
Brainswarming

GOALS
- Encouraging use of PPE
  - Locate PPE together
  - Setting Expectations
    - Posters
    - Screensaver reminder
  - Rewards for compliance
    - Monthly party gifts for top compliers
    - Board displaying compliance #s

INTERACTIONS
- PPE cabinet
- Boxes
  - Various sizes
- Gloves
- String
- Various sizes
- Fabric
- Masks
- Hangers
  - Various sizes
  - Closure
- Lab coats
- Fabric

RESOURCES
Creative Thinking Methods

intuitive techniques

Incubation
Abstraction
Observation
Analogy
Chunking

By Frits Ahlefeldt
Incubation
Abstraction
Test Packet Review (TPR)

Test Packet Review (TPR) Process Overview

DCS, GM, Supervisor, MD | DCS | Reviewer | DCS
--- | --- | --- | ---
TPR Starts | Assemble and route test packet | Review test packet, identify changes | Changes identified follow: CORP-PROC-7198, CORP-PRCS-5133, CORP-PRCS-5265 as needed
Create review schedule in tracking sheet |  | Sign off test packet | TPR Ends
TPR Solution 1

Test Packet Review Coversheet

Test Name or Mnemonic: ALA U  Test Number: 0080103

NOTE: Management—please use CORP-FORM-7330 to document review comments.

SOP Documents Related to Assay
- Procedure/Process
- Job Aid(s)
- Form(s)
- Appendix
- Newer revision of document(s) is pending in collaboration. Released revision(s) is attached.
- No SOP included:
  - Routed in task or with orderable code/mnemonic:
  - Other:

Example Reports
- Millennium Chart 1
- Millennium Chart 2
- Connect Chart 1
- Connect Chart 2
- EPIC Chart
- No EPIC chart found
- EELR Chart
- No EELR chart
- Internal Test Directory (ITD)

Calculations
- Calculation included
- Biennial Calculations under InfoCard number: _ABC-AUDIT-CALC-2020_
- No applicable Calculations

Reference Interval Report
- Reference Interval Report Included
- No Reference Interval Report Included

Component problems noted?  ☐ No  ☐ Yes
If yes, indicate in the DCS Comments section below.
TPR Solution 2

Goal to Simplify ≥ 25% 66% reduction
Goal 80% Compliance Avg 6 months 88%

Test Packet Review Guidance List

| Test Name(s) & Test Codes: |

LABORATORY SUPERVISORS
Review the SOP, Test Directory, and Example Reports. The checklist below can be used as a tool to help guide your review. Notify your department DCS or designee when your section of the checklist is complete. Note that changes just need to be identified and will be addressed after Test Packet Review is complete.

☐ Check when SOP is not routed with packet; see coversheet.

<table>
<thead>
<tr>
<th>Indicate changes needed or not applicable</th>
<th>SOP Item to Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select</td>
<td>PPE – All PPE beyond universal precautions are adequately described.</td>
</tr>
<tr>
<td>Select</td>
<td>Engineering Controls – Engineering controls used during the procedure are adequately described.</td>
</tr>
<tr>
<td>Select</td>
<td>Specimen – Specimen requirements for performing the test are described and are equivalent to those listed in the test directory.</td>
</tr>
<tr>
<td>Select</td>
<td>Review: patient preparation; specimen collection, labeling, storage, preservation, transportation, processing, referral; specimen acceptability/rejection, time limits for additional examinations</td>
</tr>
</tbody>
</table>

ITD | Reports | Comments
--- | --- | ---
| An “X” indicates shared information |  | Indicate any changes that will be needed.

Place for comments while reviewing

Where same info is located in .pdf (TD & Reports)

Role based guidance provided
Tracking what you review
Definitions added
Observation

To steal ideas from one person is plagiarism.

To steal from many is research.

Wilson Mizner
Analogy
Chunking

1) Look at these letters for 10 seconds and try to memorize as many of them as possible:

2) Now do the same thing with these letters:
### Chunking

<table>
<thead>
<tr>
<th></th>
<th>Standardization</th>
<th>Tracking System</th>
<th>Storage System</th>
<th>Visual Cues</th>
<th>Cycle Counting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Staff know low and high inventory limits</td>
<td>Electronic tracking system</td>
<td>Defined storage location (labels)</td>
<td>For some reagents, expiration dates are written on a sticky note and fixed to the outside of the box they are stored in.</td>
<td>Inventory checks and communication between 7/7</td>
</tr>
<tr>
<td>2</td>
<td>Set min/max inventory amounts</td>
<td>Use of new or expiring lot report</td>
<td>dedicated supplies locations</td>
<td>The in use lot of reagent is labeled with a bright pink sticker and stored in an area away from the unvalidated lot.</td>
<td>Frequent cycle counting practices</td>
</tr>
<tr>
<td>3</td>
<td>SOPs for put away practices</td>
<td>PTL Signals</td>
<td>Risk: in-use lot of reagent stored next to unvalidated lot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>dedicated putaway individuals</td>
<td>Risks: not knowing what is coming in shipment beforehand</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Creative Solutions to Innovation!
Innovation Blockers

By HikingArtist.com
Fear of Failure

“What’s the worst that could happen?”

HikingArtist
“The values that people cling to most stubbornly under inappropriate conditions are those that were previously the source of their greatest triumphs.”

Jared Diamond, *Collapse: How Societies Choose to Fail or Succeed*
Cultural Blocks

Tradition, Taboos

Technology

Narcissism

Stoicism, Work ethic

Scientific bias, Right-brain emphasis
Environmental Blocks

- Distractions
- Mistrust
- Lack of Support
- Autocratic Management
Intellectual Blocks

Wrong Language
Wrong Method
Wrong Information
Poor Expressive Skills
Holding Your Gains
Summary

First Step
- Know what you know;
- know what you don’t know

Second Step
- Leave the gate open

Third Step
- Let’s roll!
Resources


Limb, Charles. Your Brain on Improve.

Markman, Art. The Abstraction Method of Problem Solving - Adobe 99U.


