Introduction to Systems Thinking for Early Childhood Leaders

CEELO Leadership Academy
Washington DC

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Group

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Systems Thinking in Education
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Introduce yourself and provide a response to one of the HW reflection questions:

Reflect about yourself as a leader: How do your personal and professional qualities Align and connect with the concept of system leadership?

Synthesize your learning: What connection (e.g. similarities and differences) can you Identify between/among your Result Based Leadership learning, Heifitz’s chapters in Leadership on the Line, and The Dawn of System Leadership article?
Seeing & building shared understanding of the larger picture

Core Capabilities of System Leaders

Reflection & Generative Conversations

Co-creation & Problem-solving

Population Result(s)  Program Result(s)

Problem  Syndrome  Fix

Unresolved  Conversation

L  R

COMMON LANGUAGE

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Habits of a Systems Thinker

Seeks to understand the big picture

Observes how elements within systems change over time, generating patterns and trends

Recognizes that a system’s structure generates its behavior

Identifies the circular nature of complex cause and effect relationships

Makes meaningful connections within and between systems

Changes perspectives to increase understanding

Surfaces and tests assumptions

Considers an issue fully and resists the urge to come to a quick conclusion

Considers how mental models affect current reality and the future

Uses understanding of system structure to identify possible leverage actions

Considers short-term, long-term and unintended consequences of actions

Pays attention to accumulations and their rates of change

Recognizes the impact of time delays when exploring cause and effect relationships

Checks results and changes actions if needed: “successive approximation”
It really boils down to this: that all life is interrelated. We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly affects all indirectly.

Dr. Martin Luther King, Jr.
What connections can you make between the Habits of a Systems Thinker and your experience with Results-based Leadership?

Which Habits are especially important to your early childhood leadership work?
Seeking the Big Picture

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Your system...any system is perfectly designed to produce the results you are obtaining.

(Adapted from Carr, 2008)

If you want to see changes, view your system from an endogenous point of view.
That endogenous view (a system that can view itself internally) helps one see what influences the behavior of the system, and helps one avoid the blaming of others when things go wrong.

When things are not going well in systems, an endogenous view helps people fully examine the internal causes that influence the system’s ill behavior.

This perspective creates a rich environment for productive decision-making and improvement.
Adapted from S. Covey

*The 7 Habits of Highly Effective People*
How do your program result(s) inform and specifically impact your population results, and vice versa?

Seeing these connections is an example of seeing and understanding the larger system.

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Examples of Systems Thinking Tools

Behavior-over-time graphs

Stock/flow maps and computer models

Ladder of inference

Causal loops

Connection circles

Iceberg
Systems Thinking helps one understand what is hard to see.

Systems Thinking helps you see the system as a whole.
The Big Picture

Seeks to understand the “big picture”
Events
Patterns of Behavior
Structure of the System
Mental Models

Iceberg...
Seeing What’s Below the Surface
Recognizing Patterns and Trends

What patterns and trends do you need to be aware of as you pursue desired results of your job-embedded project?

Graphs help tell the story. They also help surface and test assumptions.
BOTG Basics

Variable/s

High

Medium

Low

Beginning

Time

Middle

Describe cause of change

End

Describe cause of change

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Collaborative efforts help surface patterns and trends of current reality and aspirations for the future.

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Image courtesy of smarnad at FreeDigitalPhotos.net
BOTG Practice

Area of professional growth

High

Medium

Low

Months or Years

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Think about your program result(s) and make a list of variables related to your project that change over time.
Possible examples of trends to graph

• Hard data:
  – Leaders with EC credentials
  – # of children in certified preschools
  – % of high quality preschools
  – 3rd grade state standardized achievement measures

• Perceptual data:
  – Legislative support for EC
  – Level of commitment to DAP
  – Quality of early childhood professional development
Other examples

• Quality of cross-sector communication
• Access to professional learning opportunities
• Awareness and skill related to DAP
• Willingness to try new things
• Commitment to children
• Attention to data
Using BOTGs to identify current and desired trends
Practice Field

Decide on a system of interest most closely related to your Population Result(s).

Choice 1: A system where all children are valued, healthy and thriving and ready to succeed in school.

Choice 2: A system where all schools and the adults who serve children are prepared to meet the needs of all children.
Directions:

1. Make a list of variables that change over time and are important to your population result(s).

2. Choose your top 8 by taking turns choosing. No need to come to a consensus.

3. Divide the variables up and individually use the half sheet BOTG templates to graph your changing elements over a specific period of time. Refer to data wall if necessary. But remember, these are trend lines and not exact data point graphs. The shape of the line is most important.

4. Take turns telling the stories of your graphs. Make changes as needed.
How could you use BOTGs in your leadership position to gather information you currently do not have? And, how could you use BOTGs in your work?
The use of mapping tools like connection circles and causal loops help define system structure and make it visible to others.
Arrange your BOTGs in a circle
Use the arrows to connect pairs of BOTGs that have cause and effect relationships:
When one element causes a change in another element
Eliminate the bottom left hand element.
“What impact does elimination or significant change in one element have on the rest of the system?”
What insights did you gain from your system map? Which changing element could serve as a leverage focus?
Independent work

• Choose to work on your population result(s) or your program result(s)
• Repeat the process that you just did with BOTGs and a connection circle.
• Draw in your journal or use available blank paper.
When you are finished, share your connection circle with a Fellow or Coach. In your connection circle, which elements seem to have the most arrow tails and thus could be considered leverage areas?

Which habits did we practice today?
Causal Loop Diagrams (CLDs) aka Feedback Loops

Can you find a loop in your connection circle map? If so, draw it on a blank piece of paper and be ready to share.

Feedback: As different parts of a system affect each other, causes become effects which in turn become causes.

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Causal Loop Diagrams (CLDs) show circular causal relationships (feedback) within a system. CLDs can show “how” and “why” a system operates the way it does.

There are 2 types of feedback loops: Reinforcing Loops and Balancing Loops.
Today, I learned...

Tomorrow, I hope to learn...
Good Morning Everyone!

Welcome to Day 2 of Systems Thinking!

Facilitator: Tracy Benson Ed.D, President/CEO- Waters Foundation, Systems Thinking Group

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What is one connection you can make between last night’s bowling celebration and a Systems Thinking Habit(s), BOTGs, connection circles or causal loops?
Habits of a Systems Thinker

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- Recognizes that a system’s structure generates its behavior
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- Checks results and changes actions if needed: “successive approximation”
THE DAY I REALIZED I COULD COOK BACON WHENVEVER I WANTED.
WEARING HIGH HEELS

I LOOK AMAZING

WOW, UNCOMFORTABLE

I’LL NEVER STAND AGAIN

MY FEET MELTED

PLEASE KILL ME

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Tap the deck to draw a challenge card and spin the spinner.
Causal Loop Diagrams (CLDs) aka Feedback Loops

Can you find a loop in your connection circle map? If so, draw it on a blank piece of paper and be ready to share.

Feedback: As different parts of a system affect each other, causes become effects which in turn become causes.
Causal Loop Diagrams (CLDs) show circular causal relationships (feedback) within a system. CLDs can show “how” and “why” a system operates the way it does.

There are 2 types of feedback loops: Reinforcing Loops and Balancing Loops.
- Things are getting out of control!
- I can’t keep up!
- We are really on a roll now!
- It’s spreading like wild fire!

R-Reinforcing Loop
B-Balancing Loop
+/s – adds to or same direction
-/o – subtracts from or opposite direction
Reinforcing Feedback

• Creates a reinforcing or compounding effect
• Examples of reinforcing feedback:
  – Rumors: “I told only one person, but soon everyone knew!”
  – Virus: “Only few had the virus at first, but soon it became an epidemic.”
  – Fads: “That fashion fad caught on quickly because soon everyone had to have it.”
Reinforcing Feedback
Causal Loop Diagram

Exercise -> Energy + S

Energy -> Exercise + S

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First Grade
Problem-solving

Mean Words → Hurt Feelings

Say "sorry" → Break up the group → Play a game with only one team

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Alex
Daniel
Nathan
Kathy

Fight
Mean words

Breaking up the group
Think of groups that don't have friends
Hurt feelings
Core Theory of Success

Quality of Relationships

Quality of Results

Quality of Actions

Quality of Thinking

Reinforcing

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Finding and feeling the balance

Steadiness
Homeostasis
Stability
Sustainability
Equilibrium
“We are experiencing some subtle ups and downs.”

“I can sense that things are beginning to settle down.”

“We seem to be achieving balance and stability.”

“Our system is close to reaching our goals.”
Balancing Feedback

• Creates an equalizing or oscillating effect
• Examples of balancing feedback:
  – Room temperature: “When the thermostat is working, the room temperature tends to be constant when it is hot outside.”
  – Exercise: “When I play basketball, my cardiovascular system and muscles are working very hard. I appreciate timeouts that give me short rest, and then I am able to get back in the game and play hard again.”
  – Supply and demand: “When fewer items are available, the price can be high, but when many are available, they tend to go on sale.”
  – Television volume: “Sometimes I have to turn the volume down during commercials to keep the volume at a constant level.”
Amount of Alcohol

# of Pins knocked down (aka bowling score)

Reinforcing

Nothing in this world can grow forever!

Balancing or Reinforcing

Ability to aim & focus

Amount of Alcohol

# of Pins knocked down (aka bowling score)
Choose one element in your connection circle. See if you can use it to create a simple loop.

Is your loop reinforcing or balancing? Be prepared to tell the story of your loop.
Archetypes capture “common stories” that occur repeatedly in diverse settings.
What do they look like?

They are drawings with multiple, interconnected feedback loops.
Archetypes are **lenses** or **perspectives** from which to see causal connections that create system behavior.

And, they help you anticipate possible problems before they occur.
We will learn and focus on 3.

- Fixes that Backfire
- Shifting the Burden
- Success to the Successful
  - Drifting Goals
  - Escalation
  - Accidental Adversaries
  - Tragedy of the Commons
  - Growth and Underinvestment
  - Limits to Success
  - Revolution
  - Story Structure
Has the need to respond quickly to a problem been greater than the importance of investigating potential unintended consequences?

Did the response help to reduce the problem in the beginning, but overtime, did consequences actually contribute to the original problem?
Fixes that Backfire

Problem Symptom

Fix

Unintended Consequence
Fixes that Backfire - “I Love Lucy”

Keeping up with the packaging line

Supervisor’s belief that workers can go faster

“Speed it up!”

Eat and hide chocolate
Second archetype for today is

Fixes that Backfire

Shifting the Burden

- Success to the Successful
- Drifting Goals
- Escalation
- Accidental Adversaries
- Tragedy of the Commons
- Growth and Underinvestment
- Limits to Success
- Revolution
- Story Structure

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Ever have days like this?
Safety

Systems thinking habits and tools can help.
How can we address problems that continually pop up no matter what we do to try and solve them?

What happens when we develop dependencies on short-term, quick-fix solutions to problems?

How can we focus on more long-term fundamental solutions?
Shifting the Burden

1. Problem Symptom
2. Symptomatic Solution
3. Fundamental Solution
4. Side Effect

Diagram:
- Problem Symptom → Symptomatic Solution
- Symptomatic Solution → Fundamental Solution
- Fundamental Solution → Side Effect
- Side Effect → Problem Symptom

Symbols:
B, R
Symptomatic Solution: Use of caffeine

Side Effect: Dependency on caffeine

Problem Symptom: Fatigue

Fundamental Solution: Energy-enhancing activities

Takes away from efforts to develop long-term solutions

p.20
Side-Effect: I depend on Wanda to fix my computer problems all the time.

Symptomatic Solution:
Wanda is good with computers. Ask Wanda to help.

Problem Symptom:
Ongoing Computer Problems

Fundamental Solution:
Wanda teaches me how to fix my own computer problems.

Takes away from efforts to develop long-term solutions
Scrabble Challenge

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Third archetype for today is

- Fixes that Backfire
- Shifting the Burden

Success to the Successful

- Drifting Goals
- Escalation
- Accidental Adversaries
- Tragedy of the Commons
- Growth and Underinvestment
- Limits to Success
- Revolution
- Story Structure
Success to the Successful

Success of A

Allocation to A instead of B

Success of B

Resources to A

Resources To B

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Mental Models

Mental models are deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action.

Slumber  Pillow
Dream    Night
Bed      Blanket
Quiet    Pajamas
Nap      Snooze
Information & experiences around me

I notice certain information & experiences.

I add my own meaning. (cultural & personal)

I develop beliefs based on the meaning I add.

I do something based on my beliefs.

My beliefs affect what I choose to notice in the future.

Ladder of Inference

Adapted from The Fifth Discipline Fieldbook. Last modified 5/05 © 2017 Waters Foundation www.watersfoundation.org
Using the Ladder of Inference

• Reflection
  – Try to suspend judgment
  – Become more aware of your own thinking and broaden your observations
Using the Ladder of Inference

• Reflection
  – Try to suspend judgment
  – Become more aware of your own thinking and broaden your observations

• Inquiry
  – Inquire into other’s thinking and reasoning
  – Ask open-ended questions that seek clarification
Using the Ladder of Inference

• **Reflection**
  
  – Try to suspend judgment
  
  – Become more aware of your own thinking and broaden your observations

• **Inquiry**
  
  – Inquire into other’s thinking and reasoning
  
  – Ask open-ended questions that seek clarification

• **Advocacy**
  
  – Make your thinking and reasoning visible to others by describing what influenced your thinking and your actions
| Left: What you were thinking | Right: What was said |
Applying the Ladder of Inference to the Interpretation of Data

1. Information, data & experiences available to me
2. What data do I choose to pay attention to? What stands out for me?
3. What meaning do I place on the data I select? How do I interpret this data?
4. What conclusions do I make? What beliefs do I hold based on my interpretations?
5. What actions should we take based on our conclusions?

My beliefs affect what I choose to notice in the future.
**Ladder of Inference as Tool for Debrief or Reflection**

**Information & Experiences:**
Based on my previous experiences what was I expecting?  
What did I notice? What did I pay attention to?  
How did my mental models influence what I noticed, heard and saw?  
Was I aware of my perceptions / mental models?

**Personal & Cultural Perspective:**
How did I interpret this experience – what are my assumptions?  
What influenced my experience of this event?  
Do others share my perceptions?  
What questions do I have?

**Beliefs:**
What do I believe based on my interpretation of my experience?  
What information led me to develop my beliefs?  
Did my beliefs affect what I noticed?  
Have any of my perceptions or beliefs changed?  
What actions will I take?

**NOTES:**

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Mental Models

What are some of the current mental models you see as you are working on your job-embedded project? Provide quotes or phrases to capture the different points of view you recognize that are at play.
What role do mental models play as you work on your job-embedded project?

What are some mental models you may be holding (about the system, about others) that may be barriers to achieving your desired outcomes?
# Iceberg Sharing Protocol

## Peer Coaching: Adapted Tuning Protocol
Choose who will be the first presenter (each fellow will take a turn being the presenter and when not presenting, will serve as a peer coach).

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 min</td>
<td>One fellow shares his/her Iceberg by describing each level of analysis: events, patterns and trends, structure and mental models. The levels can be described in any order, and the presentation will include the learning and leverage actions.</td>
</tr>
<tr>
<td>3 min</td>
<td>The peer coach(es) pose questions of clarification with the presenting fellow responding to those questions.</td>
</tr>
<tr>
<td>3 min</td>
<td>The peer coach(es) provide feedback</td>
</tr>
<tr>
<td></td>
<td>“I really like...”</td>
</tr>
<tr>
<td></td>
<td>“I wonder if...”</td>
</tr>
<tr>
<td></td>
<td>“Have you considered...”</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
<tr>
<td>4 min</td>
<td>General discussion as to how the clarifying questions and feedback will help increase learning and identify leverage actions related to the job-embedded project</td>
</tr>
</tbody>
</table>

### Notes:

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<table>
<thead>
<tr>
<th></th>
<th>System Boundaries</th>
<th>Patterns &amp; Trends</th>
<th>System Structure</th>
<th>Perspectives/ Mental Models</th>
<th>Leverage Actions</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td><strong>Defines a clear focus for the iceberg and articulates relevant system boundaries.</strong></td>
<td>Selects most significant patterns and trends and creates BOTGs that offer an accurate representation of those trends. BOTGs include both actual and perceptual data, as appropriate.</td>
<td>Presents an in-depth understanding of the structure of a system.</td>
<td>Reflects a wide diversity of perspectives and mental models relevant to the issue.</td>
<td>Identifies key leverage points and cites compelling evidence for each</td>
<td>Explanation of the iceberg includes a set of well-articulated learnings or insights that reflect thoughtful analysis of, are congruent with, and are strongly supported by information in the iceberg diagram.</td>
</tr>
<tr>
<td>3</td>
<td><strong>Defines a focus and articulates a reasonable set of system boundaries.</strong></td>
<td>Selects relevant patterns and trends and creates BOTGs that offer an accurate representation of those trends. BOTGs include both actual and perceptual data, as appropriate.</td>
<td>Presents a basic understanding of the structure of a system, identifying interdependencies.</td>
<td>Reflects multiple perspectives and mental models relevant to the issue.</td>
<td>Identifies one or more key leverage points and cites evidence for each.</td>
<td>Explanation of the iceberg includes a set of learnings or insights that are congruent with and supported by information in the iceberg diagram.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Attempts to define a focus of the system.</strong></td>
<td>Selects patterns and trends and creates BOTGs that are related to the system. BOTGs may be poorly constructed or contain clear errors.</td>
<td>Presents a limited understanding of the structure of a system with little or no reference to interdependencies.</td>
<td>Reflects limited perspectives and mental models relevant to the issue.</td>
<td>Identifies a leverage point but fails to offer support as to the reasoning behind its selection.</td>
<td>Explanation of the iceberg is tangentially related to the information in the diagram.</td>
</tr>
<tr>
<td>1</td>
<td><strong>Fails to define or describe the system to be analyzed</strong></td>
<td>Creates BOTGs that are unrelated to the system, inaccurate or fails to create graphs at all.</td>
<td>Presents little understanding of the structure of a system.</td>
<td>Presents no mental models or ones that are unrelated to the issue.</td>
<td>Identifies no leverage points or ones that are not germane or supported.</td>
<td>Explanation of the iceberg is unclear or inadequate.</td>
</tr>
</tbody>
</table>
What did you learn from your iceberg peer coach?

Reflecting on your iceberg, what might you see as leverage actions that you may not have considered before?
Mind Full, or Mindful?
Habits of a Systems Thinker

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Checks results and changes actions if needed: “successive approximation”
Based on what you have learned and experienced during this 2-day session, how do you plan to practice the Habit of a Systems Thinker that you identified as a growth area during Day 1?
Habits of a Systems Thinker

You know you're a SYSTEMS THINKER if you pay attention to...

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What approaches, exercises or strategies will you plan on using for our 2-day session to intentionally practice and continue your development as a Systems Thinker?