

Developing the Next Generation of Lean Leaders: How to Engage Young Minds and Beginners

ALAN GOODMAN, MILWAUKEE AREA TECHNICAL COLLEGE



Hot in Carlsbad!

About the presenter: An opportunity to share your mild, medium, and spicy fun facts, creating an atmosphere of intrigue, laughter, and connection.

MILD 🌟 I sell Desserts!

MEDIUM 🌟🌟 The Stork is real!

SPICY!!! 🌟🌟🌟 That time where i could have been living next to the White House...





A Little About Me

- Philadelphian
- Husband (23 Years), Father of 3
- Alumnus - Hampton University (BS), Temple University (MBA)
- Award Winning Entrepreneur / Founder - A Goodman's Desserts
- Lean Six Sigma - Expert / Professor / Consultant
- Board Member - Milwaukee College Preparatory School (K-8)

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Why teach Lean to children?

- To activate critical thinking
- To enhance creativity in decision-making
- To develop deeper awareness of causality
- To build resiliency in problem solving
- To prepare our children to be leaders in their chosen career

What are the Learning Objectives?

- Build a general understanding of Lean terms, tools, and concepts
- Developing eyes for waste
- Teaching tool identify areas for improvement in day-to-day activities

Does Anyone Remember This Scene?



The Problem at the Art Museum



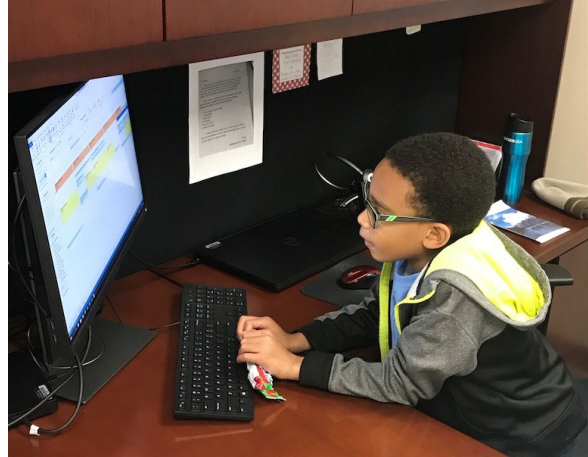
Learning Problem Solving Early

- Problem-solving skills often start to emerge during the preschool years - at about the age of 3
- Problem-solving plays a vital role in children's cognitive development
- It encourages creativity because it allows kids to view situations from different perspectives



Problem Solving is Deemphasized

- In Middle School there is less of an emphasis on problem solving specific education
- The focus is on meeting State requirements for English Language Arts (ELA) and Math Achievement



So how do we introduce Lean?

- In Summer / After School Camps
- Students Practice and Apply Lean principles and tools through in-class discussions and activities
 - Hands on activities
 - Games
 - Online curriculum
 - Simulations
 - Case Studies
 - The Personal Improvement Project

Lean: How to do Everything Better

A SUMMER CAMP STORY

Hybrid Lean Camp

- Lean Summer Camp started in 2019
- The camp was held virtually for 4 days with the 5th day in person
- The camp had 15 High School students from Milwaukee, Illinois and the Philippines!
- The camp curriculum was created via a partnership between STEM and MoreSteam, a global provider of online and blended Lean Six Sigma training



The Lean Camp Agenda

- Day 1: Waste, Process Mapping, PDCA, Charter
- Day 2: Operational Definition, Hypothesis Testing, RCA
- Day 3: 5s, Fishbone, 5 Why's, Standard Work
- Day 4: Variation, Little's Law, Kanban
- Day 5: Pilots, Implementing a Solution, Graphical Analysis

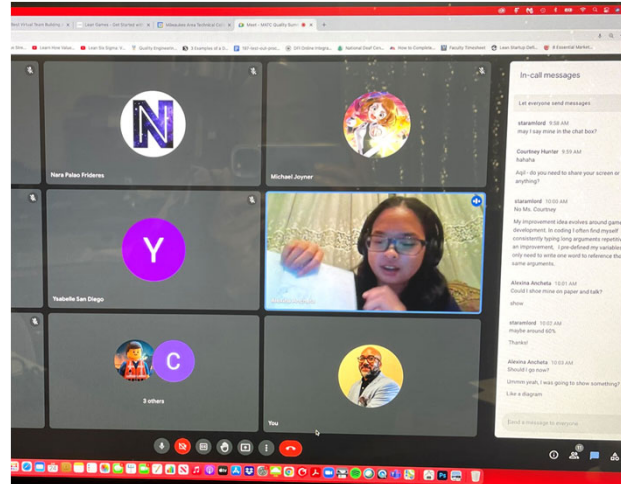
Lean Camp Games / Activities

- The Tennis Ball Game
- Chick Fil A Process Mapping
- Paper Airplane Standard Work
- 5S Numbers Game
- The Puzzle Process

In Total We Have 20+ Activities!

Identifying Improvement Opportunities

- The students discussed their Lean improvements that they identified around the house during our virtual portion of the camp



Lean Games

- MoreSteam built the Mini Lean Arcade and allowed our campers to use it for free!
- The campers played head-to-head in games focused on key Lean topics
- The 8 Wastes, 5S, Spaghetti Charts and Value Added Flow Charts



| Lesson | Topic | Viewed | ~Time (hr) |
|-----------------------------|--------------------------|--------|------------|
| Session 1: Mini Lean Arcade | | | |
| 1.1 | Lean Arcade: Intro | 📍 | 0.10 |
| 1.2 | The 8 Wastes | ✓ | 0.15 |
| 1.3 | 5-S Approach | ✓ | 0.25 |
| 1.4 | Spaghetti Charts | ✓ | 0.25 |
| 1.5 | Value Added Flow Charts | ✓ | 0.20 |
| 1.6 | Lean Arcade: High Scores | ✓ | 0.10 |
| | | | 1.05 |
| Total Estimated Hours: 1.05 | | | |

The Catapult Group Project

- On the last day of camp we had several students participate in the traditional Lean Catapult group experiment
- The goal was to determine how to hit the target by making small improvements to the catapult
- The catapult has 4 adjustable areas that impact distance, height and accuracy



The Kanban Pizza Game

- This exercise teaches how to effectively manage a workflow
- We timed the students on each round and allowed for adjustments to the workflow to fulfill the orders quickly and efficiently



The Kanban Pizza Game - The Results

- The students tracked the unfinished pizzas (WIP), Inventory and Finished Pizzas
- The group was penalized for remaining inventory and WIP
- Over 4 rounds, the students improved the workflow from completing 1 pizza in Round 1 to 21 in Round 4
- They improved by rearranging the duties and order of the process

| | WIP | Finished | Score |
|---------|------------------|----------|----------------------|
| Round 1 | 4 Crust 10 IG | 1 | $10 - 16 - 10 = -16$ |
| Round 2 | 4 Crust 18 IG | 5 | $50 - 16 - 18 = 16$ |
| Round 3 | 6 Crust 8 IG | 6 | $60 - 24 - 8 = 30$ |
| Round 4 | 9 Crust 18 IG | 21 | $210 - 54 = 156$ |

6 pizzas

$3 \times 6 = 18$ Cheese
 $3 \times 4 = 12$ Pep
 $7 \times 2 = 14$ Veggie

The Spaghetti Tower

- The students competed to construct a Spaghetti Tower using the concepts from PDCA
- The younger participants tend to find this exercise easier than the adults



The Lego Production Game

- The students work against the clock to construct as many of the prototype lego “Happy Houses” as possible
- They utilize concepts such as the 8 Wastes, Kanban, Work Cells and Kaizen



This Video Always Makes Me Smile!



The Personal Project

- Alexina, our student from the Philippines, presented her “Book of Hacks” to highlight improvements that she implemented around her house
- In just **15 hours** we created new problem solvers!
- We call it ‘Nerd Vibes’



The Tennis Ball Game

The Tennis Ball Game is a Favorite!



The Tennis Ball Game

- The Scenario:
 - I own a tennis ball factory and need to test my in house processes for the transition from finished tennis balls to packaging.
 - I need to get x tennis balls from 1 container to the other quickly to ensure continuous flow.

The Tennis Ball Game

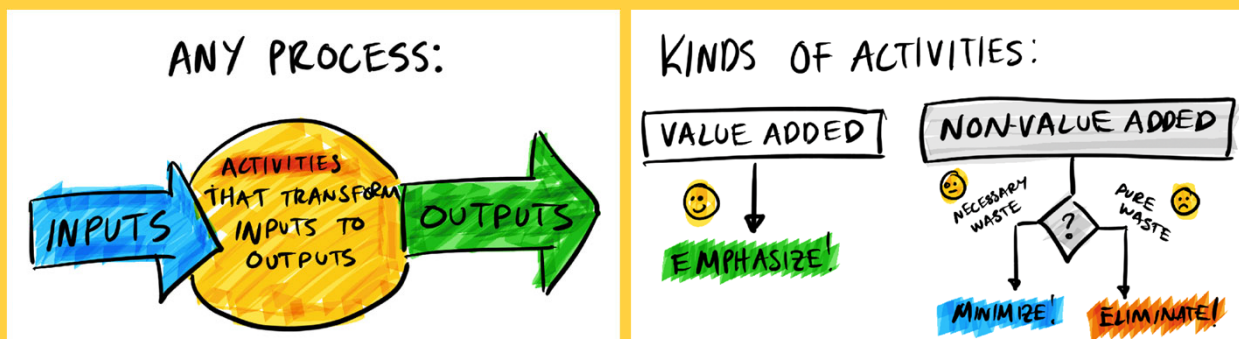
- The Problem:
 - Packaging: “The Tennis Balls are arriving too late.”
 - What does this mean?
 - How do we measure our current performance?
 - What are some areas of improvement (i.e. Find the Waste)?

The Tennis Ball Game

- The Rules:
 - Transfer the Tennis Balls from one container to the other
 - Each person must touch the ball with both hands
 - No throwing or tossing of the balls is allowed
 - This is a timed exercise

The Chick-fil-A Dilemma

What is a Process Map?



The Chick-fil-A Dilemma

- The Scenario:
 - I just moved to the US from a remote island off of the coast of New Zealand
 - I have never experienced Fast Food but someone at the airport told me to try something called Chick-fil-A

The Chick-fil-A Dilemma

- The Question:
 - How do I get there?
 - What do I do when I get there?
 - How do I get my food?



What is the Goal?

Form a Non-Profit to:

- Continue to expand Lean Camps into the local Black and Brown communities / replicate this model locally nationally
- Develop a curriculum (i.e. Junior Achievement) to grow on demand / virtual learning
- Provide intensive Lean training to “Hi-Pots”
- Partner with corporations/non profits for:
 - Funding for Professional Development of Future Leaders
 - Youth internships to solve existing problems / develop future solutions

The Ask

- * Invest in Lean for middle and high school (i’ll share our model)
- * Partner with schools in underprivileged communities
- * Connect with Companies for summer internships in OPEX
- * Contact me for questions / partnerships