Learning by doing!

„Folding Paper Airplanes Incredibly Fast“
Coaching-Kata Exercise

Gerardo Aulinger
The Kata are like a Trojan horse, a means to develop scientific working and thinking habits for everyone.

Targeted, scientific thinking and acting are skills that are not taught enough in our schooling system and should be learned and practiced by everyone! This little exercise is intended for you to try Kata at business and home with your colleagues, children, and friends!
Why do we need an **exercise**? Because Kata are difficult to explain, but easy to understand by „experiencing“!

**The Improvement Kata:**

This is the scientific Kata (or Learning routine) which we intend to **learn and understand**!
We want to better understand 3 of the 4 Roles of the Coaching Cascade: form groups of 3 persons with 1 person per role

1. **Employee in the process: Am I able to work according to standard?**
   Works cyclically, according to standard. His task is it to try to achieve the required performance in a given time and quality. As he is working productively, he has no time left for improvement. Nevertheless he is responsible for signaling problems immediately, and relay them to the process-improver as detailed as possible.

2. **Process-Improver: Is the (production-)process running according to plan?**
   (often „Hancho“, „Mentee“ or „process owner“) Observes the process and is looking for deviations from the standard. Reacts to disturbances and fault reports coming out of the process. Develops process and standard according to the Improvement-Kata and performs experiments according to PDCA. Finds and produces solutions in dialogue with the employee and the coach.

3. **Coach: Is the improvement process running according to plan?**
   (often „Master“ or „Mentor“)
   Ensures that the Mentee is working scientifically and experientially according to the Improvement-Kata, maintaining and practicing the routine. The development of the Mentee, and not the development of the process is his main focus. He regularly asks the 5 questions of the Coaching-Kata. He does not deliver nor suggest any solutions. He is responsible for setting targets and ensuring that they can be reached.

4. **Coach-Coach: Is the coaching process running according to plan?**
   Ensures that the Coachings are taking place regularly, structured and target oriented – according to Coaching – Kata. Makes sure that conditions – time, organization structure, etc.- enables that.
Our factory has received an order to produce 210,000 paper airplanes per year. We will need the Kata to master this Challenge!

This really sounds very challenging! I have no clue how we can achieve this!

Our target: 1 airplane in 30 Sek*

*210.000 Stk, 240 working days per year, 1 shift per day, 440 min net working time per day
Assembly Instructions in 15 Steps

Steps correspond Excel Process Steps Analysis Tool. Printed paper should not be pre-folded nor pre-cut.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. Take off!

Demonstrate flight stability by 4 meter long flight!
The game lasts approx. 2 hs: as soon as the Target-Condition is clear, we start **Coaching and Experimenting** towards it.

1- Planning Phase

- **Introduction, Process Analysis, Target-Definition**
  - Understand the Current Condition, approx. 20 Min
  - Define the Target Condition, approx. 20 Min

2- Executing Phase

- **Iterate towards Target Condition**
  - Coaching Cycles, 3-5 min each
  - Testing Hypothesis, approx. 5 Min
These are the Materials you need for each group

- 1 Laptop with Excel Process Step Analysis Tool
  (Download: www.verbesserungkata.de/psat)

- 30x printout paper airplane per group

- One scissor, one pencil, one eraser per group

- 2x name tags per group

- 1x Process Steps Analysis Form

- 1x Target Achievement Form per group

- 2x Coaching Forms per group

- 3x Coaching-Kata per group
Set up the **table** like this…

1. „Assembly operator“ or „Employee in process"

2. „Learner“ or „Process improver“

- Laptop with Excel-Process Step Analysis Tool on table
- Assembly instructions and airplane print outs
- Assembly space on table
- Name tag
1. Cut out name tags
2. Complete your name using a black marker
3. Fold name tag and place it in front of you
1. Cut out name tags
2. Complete your name using a black marker
3. Fold name tag and place it in front of you
Preparing the **Kata Coaching Excercise**

1. Divide participants in groups of 3 per table: who will have which of the 3 roles?
2. Fill out and fold name tags, place on table
3. Employee in process: get familiarized with the assembly of the airplane
   - fold approx. 2 planes, understand the assembly sequence, speed is irrelevant at this point
   - Read instructions sheet (2nd sheet on Excel Tool)
   - write step numbers 1 to 15 in column „Process step“
   - Complete the processes name in the white field top right
   - With button **Activate (delete everything)** activate stopwatch
   - Use ENTER to test tool and practice some time stopping
5. Repeat assembly processes five times, time each repetition with the Excel-Tool:
   - Employee in process says „Start“ and after every single step „one ready!“, „two ready!“ etc.
   - Don’t forget to save your times on your computer!
   - Do not improve the process during the 5 cycles
6. **Current Condition with PA4-Sheet:** Copy TC from green column to PA4, use a pencil
   - Copy values from Target columns „step“ and „running“ from Excel-Tool with pencil to the left to columns of the PA4-sheet
7. **Total Target Assembly Time in PA4:** defining a **challenging Target Condition** is very important for your learning success. A target of 30 seconds is recommended, write this value at the bottom of the Target Column of the PA4-Form
8. **Correct Target Step Times with Excel Tool:** press the green button **AUTO**, write „30 secs“ when asked. Copy the automatically calculated numbers to column 3, 4.
9. **Prepare coaching boards (one pinboard per group):**
   - pin PA4 left, note target on Form 5 and draw 5 columns with the 5 times you stopped

The Coaching Board is ready! The Coaching Cycles can begin!
Instructions Prozess Steps Analysis Tool 4.5

With these three buttons you can optimize the size of the sheet on your computer display.

The stopwatch must be ACTIVE in order to be able to stop your step and cycle times.

The stopwatch must be INACTIVE in order to edit text areas.

Here you can complete the name of your process.

Here you can see it the watch is running and the time elapsed.

Processes can be broken down to as many as 150 single steps.

The length of the sheet can be adjusted anytime just by clicking these buttons.

The 5 time-takings consist of cumulated, step and total times.

The shortest step time is marked in orange...

Target-times can be corrected by hand to define the target condition to achieve.

…the and taken over as Target-Step-Time. That’s why the Total Target Time is always shorter than the 5 times taken.

© Copyright Verbesserungkata.de, 2015
5- Target Achievement

Process:

Learner:

Coach:

**Airplane Assembly time**

Process indicator (incl. unit)

```
<table>
<thead>
<tr>
<th>Process indicator</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0:30 Min</td>
</tr>
<tr>
<td></td>
<td>4:42 Min</td>
</tr>
<tr>
<td></td>
<td>3:41 Min</td>
</tr>
<tr>
<td></td>
<td>4:17 Min</td>
</tr>
<tr>
<td></td>
<td>3:33 Min</td>
</tr>
<tr>
<td></td>
<td>3:57 Min</td>
</tr>
</tbody>
</table>
```

**Attention!**

*Scaling above differs from scaling below!*

Target = 0:30 Min

© Copyright Verbesserungskata.de, 2015
Set up the **Coaching Board** like this...

1. **Filled out PA4-Form**
2. **Target Achievement form with 5 bars**
3. **Coaching Form**
4. **Coaching Kata Form or 5Q-Card**
5. **Only use pencil when Filling out forms**

2. „**Learner“ or „Process improver“**
3. „**Coach““

(Attention: we do not coach the **assembly worker**!)
COACHING KATA

The 5 Questions*

1. What is the Target Condition of this process?
2. What is the Current Condition now?
3. What Obstacles do you think are preventing you from reaching the Target Condition?
4. What is therefore your Next Step and what do you expect to learn from it?
5. When can we go and see what you have learned from taking that step?

The 5 Questions on the front side of this Card and Question 1. on the rear side must be asked every time and always with the same wording as written here.

Blatt hier falten!
The 5 Questions*

1 - What is the Target Condition of this process?
2 - What is the Current Condition now?
   Go to the process, Turn Card to Reflect on the Last Step

3 - What Obstacles do you think are preventing you from reaching the Target Condition?
3a - Which One Obstacle are you addressing now?
   Turn Card to Detail the One Obstacle

4 - What is therefore your Next Step and what do you expect to Learn from it?
   Turn Card to Detail the Next Step

5 - When can we go and see what you have Learned from taking that step?

* The 5 Questions on the front side of this Card and Question 2.1 on the rear side must be asked every time and always with the same wording as written here.

Reflect on the Learnings of the Last Step Taken

2.1- What did you Plan as your Last Step and what did you learn from it?
2.2- What did you Expect?
2.3- And what did you learn from it?/from taking that last Step?
2.4- What actually happened?
2.5- What Value(s) have you measured?
2.6- Is there anything else you learned beyond what you already told me?
2.9- [Don’t forget to praise!] Thank you! Please, let us (return to the board and) write down what we have learned so far, so that we do not forget anything.

Be very specific when describing the One Obstacle to tackle next
A very detailed understanding of root cause and it’s numerical, unwanted effects are crucial in order to describe a meaningful, targeted next step! Please do not jump to solutions in this phase!

3.1- What exactly is the problem with/why...[mkw]? Can you show me, please?
3.2- Could we simulate the problem/...[mkw] right here?
3.3- What should rightly happen (so that...[mkw] can be avoided)?
3.4- Where can I see what should rightly happen (with...[mkw])?
3.5- What is actually happening (with... [mkw]?
3.6- Why/How can this mistake/this problem happen/be done?
3.7- Why is...[mkw] a problem?
3.8- What exactly is it that you do not know (about...[mkw])?
3.9- Which One Obstacle are you exactly addressing now?

Be specific when describing the Hypothesis und Experiment
Because in our Next Step we should always be testing refutable hypothesis!

4.1- How exactly will you...[mkw]? Can you show me, please?
4.2- How exactly will you take that Next Step?
4.3- And what do you expect to learn from it?
4.4- How exactly will you measure/test your expected result?
4.5- How exactly will you document your measurement(s)?
4.9- Thank you! Please, let us (return to the board and) write down what you have said so far, so that we do not forget anything.

Always take just One Step at a time

5.1- What of that next step do you think you could do today/until...[propose time]?

mkw:= try to use the mentee’s key words from the last answer he gave you in your next detailing question. He will appreciate that you are actively listening to him!
Follow the 14 folding and tearing steps one by one, have someone press enter at the Excel-Process-Steps-Analysis-Tool. Repeat 5 times to get your target condition calculated!
5- Target-Achievement

Process: [ ]
Mentee: [ ]
Coach: [ ]

Target = [ ]

Date [ ]

Process indicator [ ]
# Target-Condition (in numbers):

<table>
<thead>
<tr>
<th>Output and Process Indicator</th>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

## Current condition

<table>
<thead>
<tr>
<th>Output and Process Indicator</th>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

## Learned from last step?

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

## Only one obstacle at a time

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

## Next step and what you expect

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

## Date/Place

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

Learned from last step?

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

Was the last hypothesis refuted or confirmed?

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

Only one obstacle at a time

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

Has root cause been described and quantified?

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

Next step and what you expect

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

A refutable hypothesis with an expected, numerical effect

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

Date/Place

<table>
<thead>
<tr>
<th>Coach:</th>
<th>Mentee:</th>
</tr>
</thead>
</table>

Synchronized with step?
<table>
<thead>
<tr>
<th>Nr.</th>
<th>Process step description</th>
<th>Comments</th>
<th>Current-State</th>
<th>Target-Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Start:</td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td></td>
<td>0:00</td>
<td>0:00</td>
</tr>
</tbody>
</table>

Total time: 0:00