Standardized Work with TWI: Eliminating Human Errors in Production and Service Processes

The presentation is a supplement to the practical workshop described in the book
Standardized Work with TWI: Eliminating Human Errors in Production and Service Processes
The history of the TWI program

Early ’50s
- The Formation of the TWI program in the US

1950s–’60s
- Transfer and Implementation of the TWI program in Japan

1980s–’90s
- The revival of the TWI program in the US

1990 - now
- Replicated success worldwide with TWI
The key role of the supervisor in the TWI program

The image was copied from the following internet address:
Five needs for a supervisor

**SKILLS**
Training Within Industry
- Skills in Improving Methods
- Skills in Leading
- Skills in Instructing

**KNOWLEDGE**
- Knowledge of the Work
- Knowledge of the Responsibilities
The definition of standardized work

Writing down the best currently known way of performing operations at any workplace with consideration of **Occupational Health and Safety, quality, ergonomics and correctness**; and then training all employees in it.
Challenge

Be the first to write down **5 examples** of standardized work from your own life.
Training Within Industry - a key element of standardized work

Training Within Industry

Instructions
- Documentation of expert knowledge

Methods of work
- Improvement

Training
- On-the-job training

Standardization should be applied to processes which are special, repeated frequently or which were selected for standardization due to, e.g., high complexity.
Learn to make the plane using the template
Task No. 2
Write down the instructions

• Work in a group

• Write the instructions with text only - no images. The more precisely they are described, the greater the chance that another group can make the plane.

• People from the Green Group are requested not to look at the templates of red planes. Conversely, people from the Red Group must not peek at templates from the Green Group.
Task No. 3
Trying

Try to make the plane using the descriptive instructions from another group

• Use only the descriptive instructions prepared by the different color group

• After making the plane, give it to the authors of the instructions you used so that they can check it
The learning curve
What situations can on-the-job instructions be used in?
Features of a Good Standard

1. WHAT?
   - What steps should be taken?
   - SEQUENCE OF OPERATIONS

2. HOW?
   - How is a specific step properly performed?
   - WAY OF PERFORMING OPERATIONS

3. WHY?
   - Why should the step be performed in this way?
   - REASON FOR PERFORMING OPERATIONS

4. HOW LONG?
   - How long should the specific step take?
   - TIME DURATION OF OPERATIONS

5. WITH WHAT?
   - What tools should the specific step be performed with?
   - TOOLS FOR PERFORMING OPERATIONS

6. VISUALIZATION
   - Because people notice 83% of information VISUALLY

Slide No.: 13  Standardized Work with TWI  www.leantrix.com
Applying instructions to on-the-job training

What methods of sharing knowledge do you know?
Methods of on-the-job training

Description only
The learning curve

- Read: 10%
- Heard: 20%
Methods of on-the-job training

Presentation only
The learning curve

- Read: 10%
- Heard: 20%
- Seen: 30%
Methods of on-the-job training

Training in accordance with the TWI JI method
The learning curve
## The construction of the TWI JI method

<table>
<thead>
<tr>
<th>Steps of the TWI JI method</th>
<th>Key points for steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
</tr>
<tr>
<td>2.</td>
<td>1.</td>
</tr>
<tr>
<td>3.</td>
<td>1.</td>
</tr>
<tr>
<td>4.</td>
<td>1.</td>
</tr>
</tbody>
</table>

**Slide No.: 21**

Standardized Work with TWI

www.leantrix.com
## The construction of the TWI JI method

<table>
<thead>
<tr>
<th>Steps of the TWI JI</th>
<th>Key points for steps</th>
</tr>
</thead>
</table>
| 1. Prepare the learner | • Put the learner at ease  
• State the job  
• Find out what the learner already knows  
• Get the learner interested in learning  
• Arrange the learner’s position so that they are able to see everything |
| 2. Present the operation | • Presentation 1. The instructor performs the job describing every major step.  
• Presentation 2. The instructor performs the job describing every major step and the key points.  
• Presentation 3. The instructor performs the job describing every major step, the key points, and the reasons for the key points. |
| 3. Try out performance | • Presentation 1. The learner performs the job in silence – the instructor pays attention to any bad habits and corrects them immediately.  
• Presentation 2. The learner performs the job describing every major step.  
• Presentation 3. The learner performs the job describing every major step and the key points.  
• Presentation 4. The learner performs the job describing every major step, the key points, and the reasons for the key points. |
| 4. Follow up | • Put the learner on his or her own and define tasks to do  
• Designate whom to go to for help  
• Check frequently  
• Encourage questions  
• Taper off coaching as appropriate |
Motto of the TWI JI method

If the learner hasn’t learned, the teacher hasn’t taught!
### Construction of a Job Breakdown Sheet

<table>
<thead>
<tr>
<th>MAJOR STEPS</th>
<th>KEY POINTS</th>
<th>REASONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A LOGICAL SEGMENT OF THE OPERATION WHEN SOMETHING HAPPENS TO ADVANCE THE WORK.</td>
<td>ANYTHING IN A STEP THAT MIGHT 1. MAKE OR BREAK THE JOB 2. INJURE THE WORKER 3. MAKE THE WORK EASIER TO DO, I.E. “KNACK”, “TRICK”, SPECIAL TIMING, BIT OF SPECIAL INFORMATION</td>
<td>REASONS FOR EACH KEY POINT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WHAT?</th>
<th>HOW?</th>
<th>WHY?</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHOD</td>
<td>MAN</td>
<td></td>
</tr>
</tbody>
</table>
A **major step** is a part of work that results in progress.

Major step answer the question: **What are you doing?**
The descriptive instructions for tying the Fire Underwriter’s Knot

Instructions for tying the Fire Underwriter’s Knot

1. Pick up the wire.
2. Hold it with your left hand, between your thumb and your index finger, 6 inches from the end.
3. Untwist the loose ends, forming a V.
4. Straighten the loose ends between the thumb and index finger of the right hand.
5. Hold the wire at the beginning of the V.
6. Take the right-hand loose end with the right hand, making a clock-wise loop, bringing the loose end across in front of the main strand.
7. See that the loop is about 1 inch in diameter and that the stub sticks out to the left of main strand about 2 inches. Hold the wire at the junction of the loop and the main strand.
8. Take the other loose end with your right hand.
9. Make a counter-clockwise loop. To make this loop, pull the wire forward, pass it underneath the stub, behind the main strand.
10. Pass the loose end through the right-hand loop, from back to front.
11. Hold the ends evenly between the thumb and the index finger of the right hand.
12. Pull the knot taut.
13. Shape the knot between the thumb and the index finger of left hand as it is pulled taut.
Aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it
deosn't mttae in waht oredr the ltteers in a wrod are, the
olny iprmoatnt tihng is taht the frist and lsat ltteers be at
the rghit pclae. The rset can be a toatl mses and you can sitll
raed it wouthit porbelm. Tihs is bcuseae the huamn mnid
deos not raed ervey lteter by istlef, but the wrod as a wlohe.
**Key Points**

**Key points** are all the elements which can lead to the proper or improper performance of a job or employee injury, as well as the actions which make work easier (“tricks”, intuition).

Key points answer the question:

**How do you perform a given major step?**
# The Standard Work Instruction - SWI

<table>
<thead>
<tr>
<th>Prepared: Adam Smith</th>
<th>Area</th>
<th>Operation</th>
<th>Cycle Time C/T:</th>
<th>Date</th>
<th>Instruction Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checked by: Adam Moore</td>
<td>Prod</td>
<td>Tying the Fire Underwriter’s Knot</td>
<td>28</td>
<td>06/01/2015</td>
<td>A/4/2015</td>
</tr>
</tbody>
</table>

## Pictures

1. Untwist and straighten
   - Time [s]: 8
   - Key Points:
     - 1. About 5 inches
   - Reason: 1a. Too long – must cut ends; too short – tie the knot again
   - 1b. Enhances measurement of distance

2. Make a right loop
   - Time [s]: 2
   - Key Points:
     - 1. In front
   - Reason: 1. The knot will not tie correctly. If you pull the cable in the front, the knot will not tie in the last step

3. Make a left loop
   - Time [s]: 4
   - Key Points:
     - 1. Pulling end toward you
     - 2. The knot will not tie correctly. If you won’t have a loop, the knot will get untied under pressure
     - 3. Enhances remembering that most the cable has to be pulled by the right loop from the back

4. Put end through loop
   - Time [s]: 3
   - Key Points:
     - 1. Ends even

5. Pull taut
   - Time [s]: 11
   - Key Points:
     - 2. Sliding loops down
     - 3. Firmly
     - 3. So it won’t come apart

## Materials:
- Wire set

## Tools:
- None

## Symbols:
- Quality
- Safety
- Correctness
- Tricks
Preparation of Standard Work Instructions (SWIs) for the operation of making paper planes.
Task No. 5
Unification of SWIs

• Work in 2 groups (green and red)

• Create one SWI for planes

• It shouldn’t be a compromise - it has to be the best method of making the plane!
# A reminder of the construction of the TWI Job Instruction method

## Steps of the TWI JI

<table>
<thead>
<tr>
<th>Steps of the TWI JI</th>
<th>Key points for steps</th>
</tr>
</thead>
</table>
| 1. Prepare the learner | - Put the learner at ease  
- State the job  
- Find out what the learner already knows  
- Get the learner interested in learning  
- Arrange the learner’s position so that they are able to see everything |
| 2. Present the operation | - Presentation 1. The instructor performs the job describing every major step.  
- Presentation 2. The instructor performs the job describing every major step and the key points.  
- Presentation 3. The instructor performs the job describing every major step, the key points, and the reasons for the key points. |
| 3. Try out performance | - Presentation 1. The learner performs the job in silence – the instructor pays attention to any bad habits and corrects them immediately.  
- Presentation 2. The learner performs the job describing every major step.  
- Presentation 3. The learner performs the job describing every major step and the key points.  
- Presentation 4. The learner performs the job describing every major step, the key points, and the reasons for the key points. |
| 4. Follow up | - Put the learner on his or her own and define tasks to do  
- Designate to whom to go to for help  
- Check frequently  
- Encourage questions  
- Taper off coaching as appropriate |
Thank you!

Any questions?
All materials included in the presentation are taken from the book

**Standardized Work with TWI:**

*Eliminating Human Errors in Production and Service Processes*

This presentation is an integral part of the book and cannot be used without purchasing it.

A list of publications (bibliography) which this presentation was based on is included in the book.