



## **Train2Sustain – developing capacity to teach sustainability in VET**

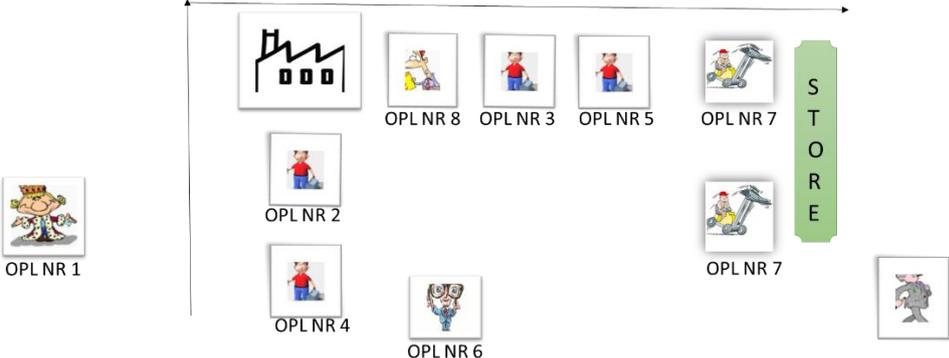
Learning Activity nr. 11

### **Ballpoint pen game (sustainability version)**

Projektnummer: 2020-1-FI01-KA202-066632

<b>ACTIVITY NAME</b>	A11 <b>Lean ballpoint pen game (sustainability version)</b>
<b>OBJECTIVES</b>	<ul style="list-style-type: none"> <li>▪ Discover all 5 basic principles of LEAN thinking and working. Especially the process is important in this game</li> <li>▪ Know how to consider sustainable aspects in the work</li> <li>▪ Understand a more efficient company can contribute to a better environment.</li> <li>▪ Understand how a more efficient company can contribute to a better social environment.</li> </ul>
<b>DESCRIPTION</b>	<ol style="list-style-type: none"> <li>1. <b>Explain the activity to the students (briefing)</b> <ul style="list-style-type: none"> <li>▪ It is an imitation of a process in a production factory of ballpoint pens.</li> <li>▪ The aim is to put built the number of ballpoint pens required by the customer.</li> <li>▪ The factory has a director (teacher), who is helped by a process guard.</li> <li>▪ On the working floor there are four production workers; all specialized in one part of the production of ballpoint pens.</li> <li>▪ A quality controller checks all the ballpoint pens before they are transported to the customer.</li> <li>▪ To transport the ballpoint pens there is the possibility to use two carriers. They can transport only 4 ballpoint pens or parts of the pen intern to the production workers and quality controller and extern to the customer.</li> <li>▪ Each activity/working task is consuming a certain number of energy units, as described in the PowerPoint document.</li> <li>▪ The factory is built in 1953. The production line is not logical anymore.</li> <li>▪ There is a store in the back of the building. The working places of the employees are far away. The quality controller works in the office.</li> <li>▪ The aim is to put this ballpoint pen of good quality on the market.</li> <li>▪ The process guard will give the KPI to the Director.</li> </ul> </li> <li>2. <b>Run the activity</b> <ul style="list-style-type: none"> <li>▪ During the first round everybody starts in the start position as shown on slide number 5 of the PowerPoint document. Use a clock to measure the time.</li> <li>▪ You get 10 minutes of preparation time, in which you start thinking about improvements. You can then eliminate wastes and experiment (how do we tackle it, etc.)</li> <li>▪ The working day takes 4 minutes.</li> <li>▪ There are a total of 3 production days.</li> <li>▪ The various activities are recorded in one-point lessons (PowerPoint document). Given the nature of the work, an employee can't make the entire ballpoint pen.</li> <li>▪ The customer demand is 28 ballpoint pens each day.</li> </ul> </li> <li>3. <b>Evaluation of the first round</b></li> </ol>

	<ul style="list-style-type: none"> <li>▪ The key performance indicators (KPIs) are evaluated at the end of each day: <ul style="list-style-type: none"> <li>○ Time to produce 1st ballpoint pen</li> <li>○ Number of well-supplied ballpoint pens</li> <li>○ Number of incorrect ballpoint pens</li> <li>○ Number of semi-finished products in the process</li> </ul> </li> <li>▪ Questions you could ask? <ul style="list-style-type: none"> <li>○ What happened?</li> <li>○ How did you feel?</li> <li>○ Did we meet the goals? Why not?</li> <li>○ How can we do it better (don't forget sustainability issues like energy consumption, waste)?</li> </ul> </li> </ul> <p><b>4. Improve and replay</b> During the preparation time of the second and third rounds, everybody may renovate or reduce the waste (and change the places of the workstations).</p> <p><b>5. Evaluation (debriefing)</b> <b>Hint: Remember that the second and third rounds are played in chapter 5.</b> Conclude the game regarding the LEAN principles:</p> <ul style="list-style-type: none"> <li>▪ Principle 1: What is the value for the customer?</li> <li>▪ Principle 2: Does each step in the chain add value for the client?</li> <li>▪ Principle 3: Is there a continuous flow in the process?</li> <li>▪ Principle 4: Was there Pull production? Did you only deliver what the customer asked for?</li> <li>▪ Principle 5: Could we do it even better? How can we pursue perfection?</li> <li>▪ Principle 6: Was it difficult to change the mindset in this game? And in real life?</li> <li>▪ Have you considered sustainable aspects when planning and performing the game? Do you feel you have used less energy in the 2<sup>nd</sup> and 3<sup>rd</sup> rounds?</li> <li>▪ What could the company do with the higher profit they have? What about social aspects (e.g. better working conditions, social programs for the community, etc?)</li> </ul>
<b>TIME TO PLAY</b>	<p><b>Total time:</b> 140 min. -----</p> <p><b>Preparation time:</b> 60 min (have the material beforehand) <b>Briefing time:</b> 5 min <b>Activity time:</b> 10 min. preparation time &amp; 5 min. time working day (round) <b>Evaluation time:</b> 10 min. per round</p>
<b>INDIVIDUAL or GROUP</b>	<p>Done in a group.</p> <p>Number of groups: 1 or 2 Number of students per group: 9 Adaption is possible with fewer players (leave out the customer, although he is important).</p>

	<p>If there are more students, they can observe the process and propose improvements, be the timekeeper.</p> <p>Roles: refer to the PowerPoint document</p>
<p><b>MATERIAL FOR TEACHER</b></p>	<ul style="list-style-type: none"> <li>▪ Activity explanation</li> <li>▪ Video tutorial</li> <li>▪ PowerPoint presentation</li> <li>▪ timer or stopwatch: 10 min. preparation and 4 min. working day</li> <li>▪ writing board or flap-over to write down the KPI's results</li> <li>▪ It is important to have a pen with multiple parts, to follow the instruction cards.</li> <li>▪ 7 parts pens are used for the instruction cards.</li> </ul>
<p><b>MATERIAL FOR STUDENT</b></p>	<ul style="list-style-type: none"> <li>▪ 9 one-point-lessons; instruction of the customer, production workers, quality controller, carriers, process guard and the director/game leader.</li> <li>▪ 72 ballpoint pens for two groups (if possible 36 red and 36 black ballpoint pens)</li> <li>▪ 7 plastic trays to store the parts of the ballpoint pens</li> <li>▪ 2 trays to transport the ballpoint pens</li> <li>▪ 10 centimeters ruler</li> <li>▪ 1 timer or stopwatches.</li> </ul>
<p><b>LAY OUT</b></p>	<p>A big classroom for a group of 9/18 people. Tables and chairs to make working areas and a store. Enough space to walk.</p> <p style="text-align: center;"><b>FLOOR PLAN PEN FABRIC</b></p>  <p>The floor plan diagram, titled 'FLOOR PLAN PEN FABRIC', shows the layout of 9 One-Point-Lesson (OPL) stations and a store. The stations are arranged as follows: OPL NR 1 (customer icon) is on the left. OPL NR 2 (worker icon) is below OPL NR 1. OPL NR 4 (worker icon) is below OPL NR 2. OPL NR 8 (worker icon) is at the top left. OPL NR 3 (worker icon) is to the right of OPL NR 8. OPL NR 5 (worker icon) is to the right of OPL NR 3. OPL NR 6 (worker icon) is below OPL NR 4. OPL NR 7 (machine icon) is at the top right. Another OPL NR 7 (machine icon) is below it. A vertical 'STORE' area is on the far right. A factory icon is at the top left, and a customer icon is at the bottom right.</p>