Smart and Keen Company - My Trolley Chip

In this module a product chain with networked components a trolley chip is produced.

This training system shall simulate an assembly on demand process in the classroom. The customer can select on the smartphone the trolley chip he would like to get. The trolley chip will then be assembled out of four different bottom parts and four different inserts with different colours. The smartphone is linked to the PLC-program which controls the assembly station.

The trolley chip assembly station consists out of two rotary magazines, one for the bottom parts and one for the inserts. According to the customer selections, the rotary magazines will rotate in the required position. In the centre is the assembly module where the chips will then be pushed together.

The complete training system is made only out of 3D-printed and standard parts. It uses pneumatic cylinders, electrical motors, sensors and is controlled by a PLC-program. All 3D-models, drawings and programs can be downloaded from the EU-Internet site. This will enable every school or training facility to build it by themselves and adjust it to their requirements.

Sequences

Scenario means a narrative scenario which is presented in an authentic situation.

Tasks means the development of the concrete tasks, the work plan, (international) division of work, ways of collaboration

Problem solving means a multidisciplinary or multinational problem solving, implementation of the tasks

Assessment means an assessment of training success

Reflection and evaluation means a meta-cognitive self-reflection and evaluation of the learning process

Content/ Material

Scenario

In this student learning module you will design the central part of the trolley chip assembly station, the assembly module.

- Voki-1
- student-module-1-design-scenario-2018-09-13.pdf
- trolley-chip-assembly-station-2018

Tasks You have to design the assembly module of the assembly station. You will use creative methods to come up with new ideas. Then you have to detail your design and decide which version you will use. You will create the 3D-CAD-models and the related drawings. At the end your design will be 3D-printed and tested. You also have to create a timeline, a specification sheet, a documentation and a presentation.

- Voki-2
- student-module-1-design-tasks-2018-09-13.pdf
- trolley-chip-assembly-station-2018-07-2018-07-lang.mp4

In the following documents you will find all the information you need to start with the design process.

- documents-tcas-design-01-2018-09-13.pdf
- 4-0-08-01-chip-bottom-version-2-print-1.stl
- 4-0-08-02-chip-insert-version-2-print-2.stl
- specifiaction-sheet-empty-2018-09-13.docx
- trolley-chip-timeline-empty.xlsx
- template-VET-A3.idw

Assessment

Create a documentation and a presentation. Print the parts, assemble and test it. If all requirements are fulfilled, it is a good design

Reflection and evaluation

The learning process and/or the results have to be reflected and evaluated. The students should come to know how they can improve themselves.

PLC guided Reflection

How to use

Scenario: View the Vokies, the video and read the pdf-document.

Tasks

Objectives and expected results**:** In this student learning module you will design the assembly module of the assembly station in a design team. You have to create 3D-CAD models and print them with a 3D-printer. You have to plan your work, define work tasks and work together in a team. You also have to create a timeline, a specification sheet, a documentation and a presentation.

Proceeding**:** View the Vokie, the video and read the pdf-document. You have to create 3 design sketches of possible solutions of the assembly module. You have to find advantages and disadvantages of the different solutions and make the decision, which one you will further detail.

Time frame**:** You will need approx. 40 hours each, when you work in a design team of 4 students. Approx. half of this time is required in the class room.

Ways of cooperation**:** You have to work together in a team and organize the communication, especially the transfer of the 3D-models. You have to adapt your design to new requirements.

Problem solving

Details of the handling**:** Before you start with the designwork you have to write the specification sheet and create a timeline to define who will do what in your design team. You should use creative methods to come up with new ideas. You have to detail your design and decide which version you will use. Then you will create the 3D-CAD-models and the related drawings. At the end your design will be 3D-printed and tested. View the drawings. Print the stl-files of the chips with your 3D-printer. If the size of the printed parts is not according to the drawings, you have to adjust your printer settings or create your own 3D-model and adjust the dimensions. You can use the empty word and excel documents to create your timeline and specification sheet. You can use the drawing template if you are using Inventor as your 3D-CAD-

software. If you are using a different CAD system, you have to design your own templates.

Assessment

It will be checked if your assembly module fulfils all the requirements of the specification sheet. Therefor the parts will be printed and tested. The drawings will be checked if they are in accordance with the valid drawing standards. The documentation will be checked if the design process is described and your decisions are explained. The presentation layout and your presentation skills will be assessed.