Teaching standard STEM topics with a key competence approach

Module 10 : HOUSEHOLD APPLIANCES (ENGINEERING)

OVERVIEW AND AIM

- Household appliances are a standard topic of engineering, offering a vast field of practical application examples.

- Children's first experiences with technology happen at home. Although such a rich context offers a lot to teach important features of engineering, they are not often used as a context in the curriculum, even less so in a hands-on manner.

- This module explores ways of incorporating engineering concepts and practices into STEM education in the context of household appliances.

TEACHING AND LEARNING DIMENSIONS

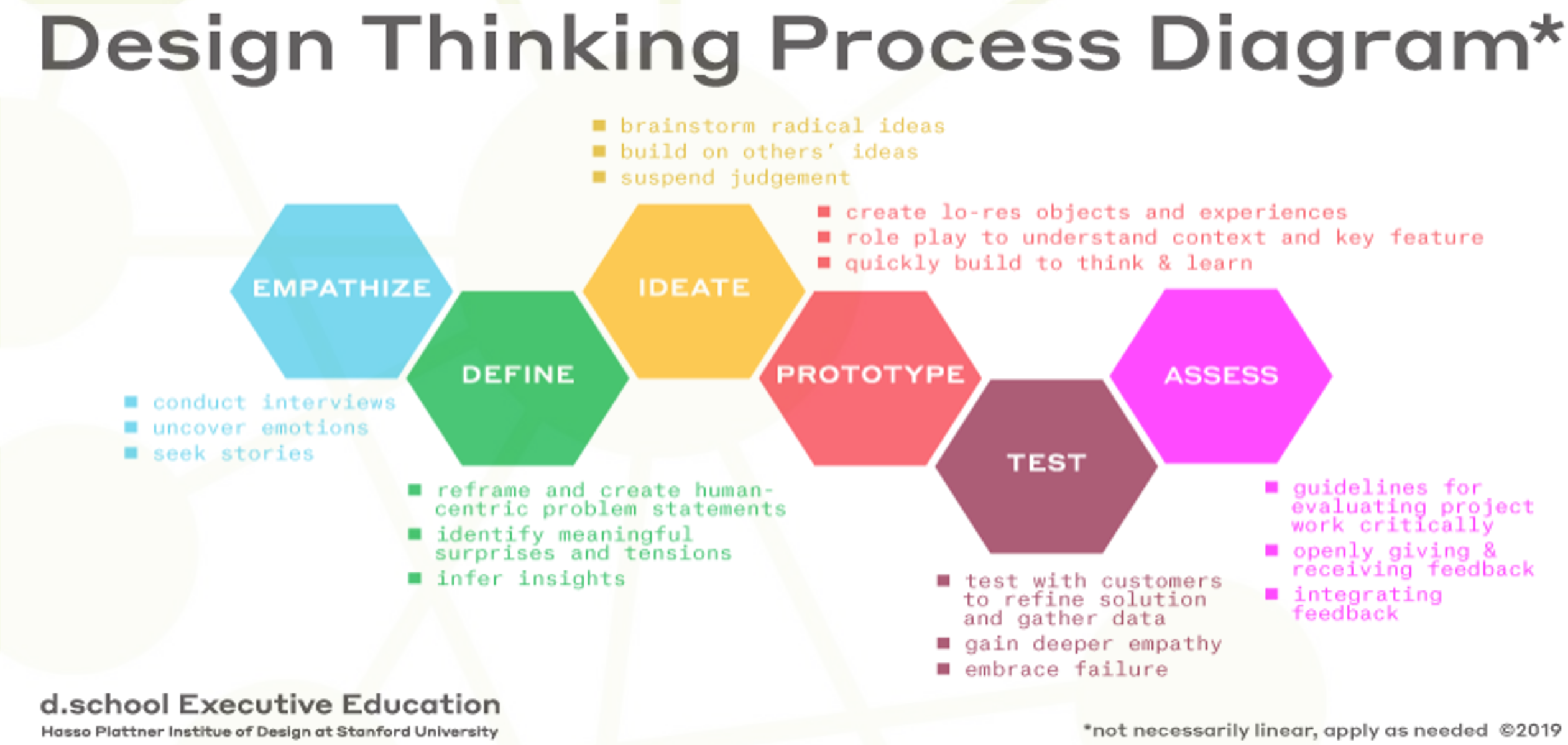
- Research shows that teachers have difficulties in delivering engineering practices into their classrooms. Also, many future teacher programs lack courses on engineering education.

- Pedagogical practices like design thinking would help teachers to make key aspects of engineering visible to students. In this module, we will frame activities from a design thinking perspective.

- Design thinking is a creative problem-solving process. A way to start understanding design thinking is with this process from the Stanford d.school (see Figure below). It includes empathize, define, ideate, prototype, test, and assess stages; nonetheless, this process is not absolute, and is not always linear.

- In this module, future teachers are expected to generate creative solutions to a challenging problem by developing or improving a technology and to work like engineers. For instance, they are asked to design and build their own vacuum cleaner, blender, hair dryer or any other home appliances.

- Through such practical real-world connections, future teachers will have an opportunity to see how STEM is part of their everyday world. That kind of tasks enable future teachers to develop "engineering pedagogical content knowledge.



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Co-funded by the Erasmus+ Programme of the European Union

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