

# SUPSI

## PROPOSALS/VORSCHLÄGE

Bürgenstock-Konferenz 2020

### «Innovationen – Bedingungen für ihr Gelingen an Fachhochschulen und Pädagogischen Hochschulen»

Call for Cases – Ateliers am Freitag, 10. Januar 2020, nachmittags, KKL Luzern

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#### Departement

DTI-ISTePS

#### Name Präsentation (Ateliers/Cases)

Drawbridge for future engineers

#### Kurze Beschreibung auf 1-2 Seiten max.

The project "**Drawbridge for future engineers**" is an example of teaching experience proposed by two colleagues who teach in courses attended by students of the first year of Engineering and Management at SUPSI and, in particular, they deal different modules such as *Introduction of Java programming* and *Industry 4.0* (managed by Eng. Giuseppe Landolfi), *Building Sciences* and *Technological Processes* (managed by Eng. Paolo Giorgetti). The idea of the project was born from the desire to introduce a multidisciplinary activity that would act as a bridge between different courses of engineering, especially between those courses that are often considered by students to be unrelated and not really close to the chosen study plan.

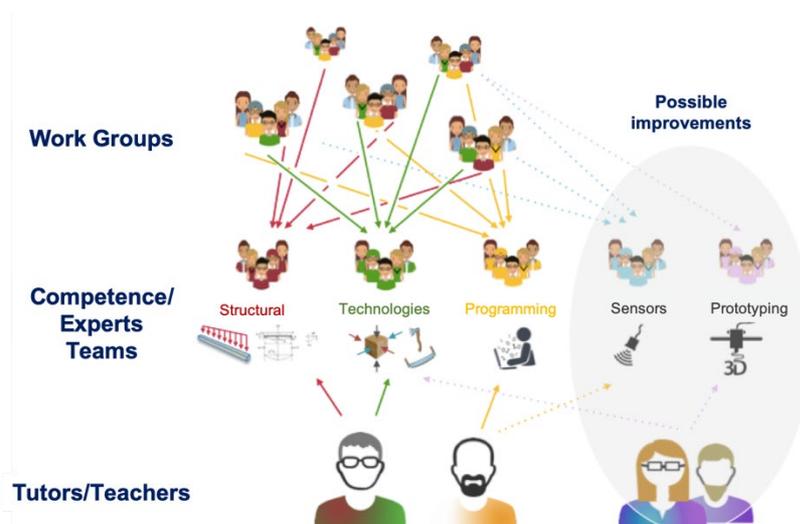


Figure 1 Work organization

Through a role-playing game, it was possible to simulate in the classroom all dynamics typical of a real design context where different professional skills must interact in order to reach a common goal and where the management of a complex project requires a systemic approach.

During the preliminary phase of the project, the class was divided into 6 groups of 4 students and each group was asked to design a drawbridge with the technologies and materials of the year 1000 AD, starting from a few requirements provided by the teachers concerning dimensions and maximum load. Within the groups, each student had been assigned randomly to a specific role with specific skills: structural, technological and programming competences (corresponding to the involved courses). The students with the same role, although belonging to different groups, were grouped into teams of experts with the aim of collaborating to deepen the topic of competence.

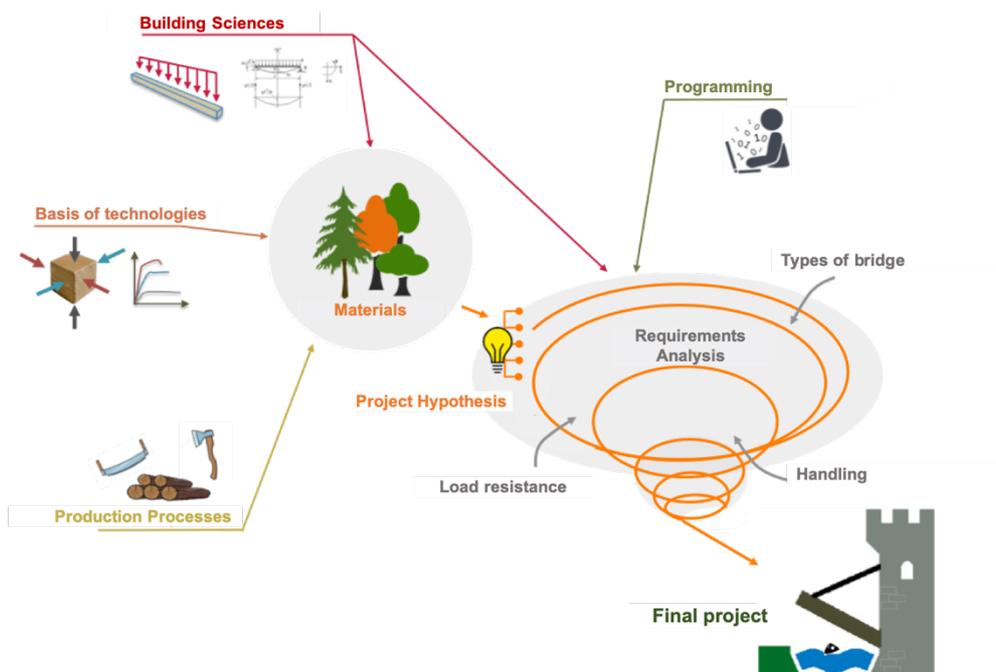


Figure 2 Schema representing the elements involved in the drawbridge design

The experience as a whole was very positive for the students who worked with enthusiasm, taking seriously the assigned roles, producing several results and all with appreciable solution elements. From the teachers' point of view, the efforts made in the preparation and management of the activities have been amply repaid both by the achievement of the predefined objectives and by the awareness of having proposed an innovative educational path. According to the teachers, this experience goes in the direction of preparing students for the world of work where multi-disciplinarity is a must which brings an added-value, especially in engineering courses where the systemic vision for approaching problems is a fundamental element. At the same time, the use of a role-playing game has made it possible to experiment innovative forms of teaching that complement the more traditional frontal lessons with cooperative learning activities, aligned with the most recent pedagogical indications.

On the basis of the experience gained, the teachers identified some points for improvement such as, for example, to extend the proposed project embracing other courses like Industry 4.0, thank to which students will be able to prototype the designed bridge by means of additive manufacturing and equip it with a set of sensors able to acquire interesting data such as loads, axes movements and environmental data.



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