Design of Learning Spaces for Enhanced Learning @ Skoltech

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Faculty, students,,,, build Skoltech together!
''Universities build a new University

Image (c) Herzog de Muron

Oct 2013

2016-xx-yy
''SOON''

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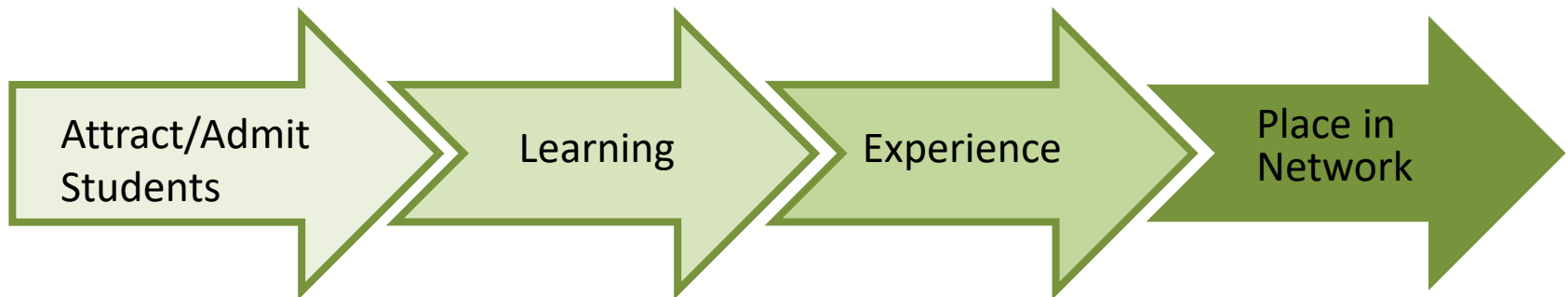Skolkovo Institute of Science and Technology

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Education Goals
> base for the design of Learning Spaces

- **Educate students in integrated science, technology and innovation based Master's and Ph.D. programs, empowering a new "Skolkovo generation" with the skills, knowledge and competence to enable them to bridge the gap between fundamental science and innovation, to become transformative members of society, and to make economic and social impact in the Russian Federation and around the world.**

Attract/Admit Students → Learning → Experience → Place in Network

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Skoltech - Education for Innovation

→ Learning outcomes responsive to the input of stakeholders

→ An education in the process, skills, self-confidence and leadership of innovation

→ Programs that are based on modern thought on learning and contain a blend of innovation and problem-based education

→ Master's and Doctoral students work side by side with researchers and professors of all ranks – a continuum of peers

Learning

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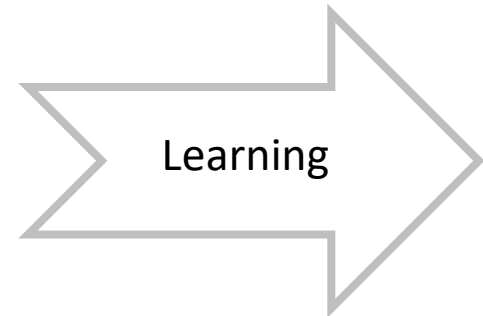
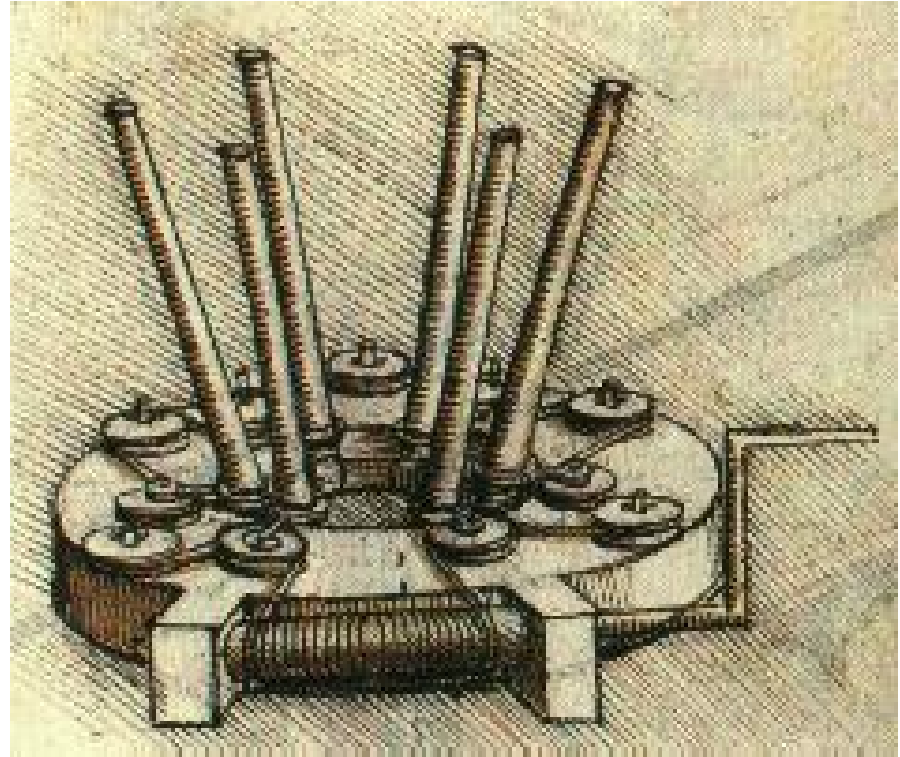# Skoltech Education With Many Opportunity Cycles for Practice including **prototyping**

→ In order to meet the learning outcomes for skill and attitudes, build retention and self-efficacy it will be necessary to have rich experiences in practice:

  → In Application periods at the ends of terms

  → In January – Independent Studie Period ISP

  → In innovation project, research project and thesis

  → Integrate co- and extra-curricular elements in the learning experience

→ The opportunity to emphasize the need for sustainability in technical endeavors

→ Integrating professors with industrial experience into the process is also key to meeting our objective,

Experience

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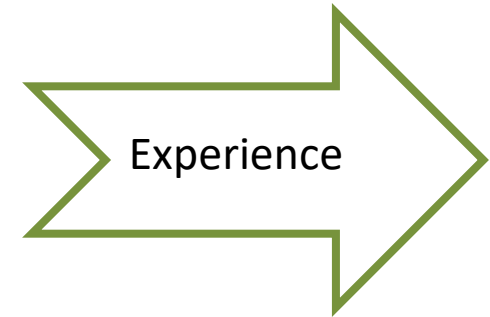
Motivation for prototyping is not new

Leonardo da Vinci

Device for a Barrel Spring, c. 1498

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The motto on the seal of MIT and KTH

→ "Mens et Manus"— "*Mind and Hand* traces the ideas about science and education that have shaped MIT.

→ Science and Art, Vetenskap och Konst (Swedish) for KTH where Art refer to artifacts.
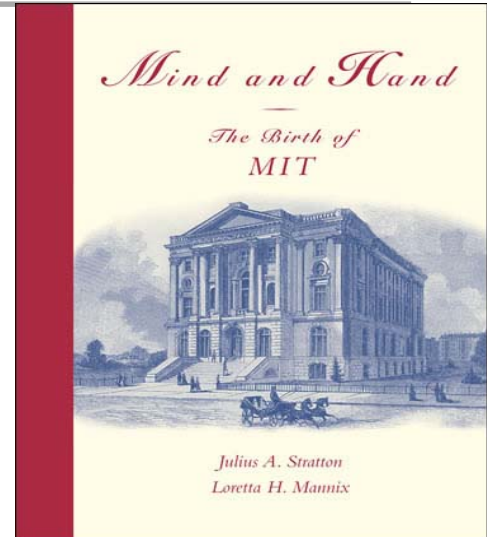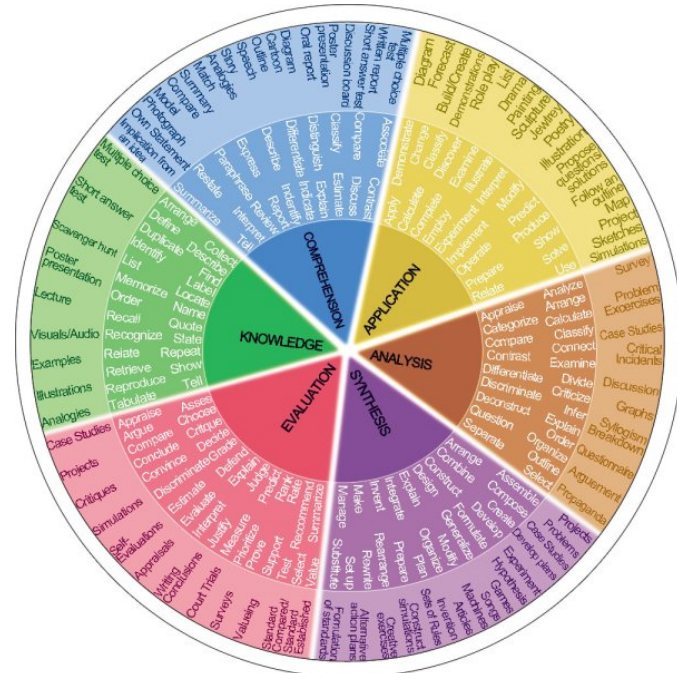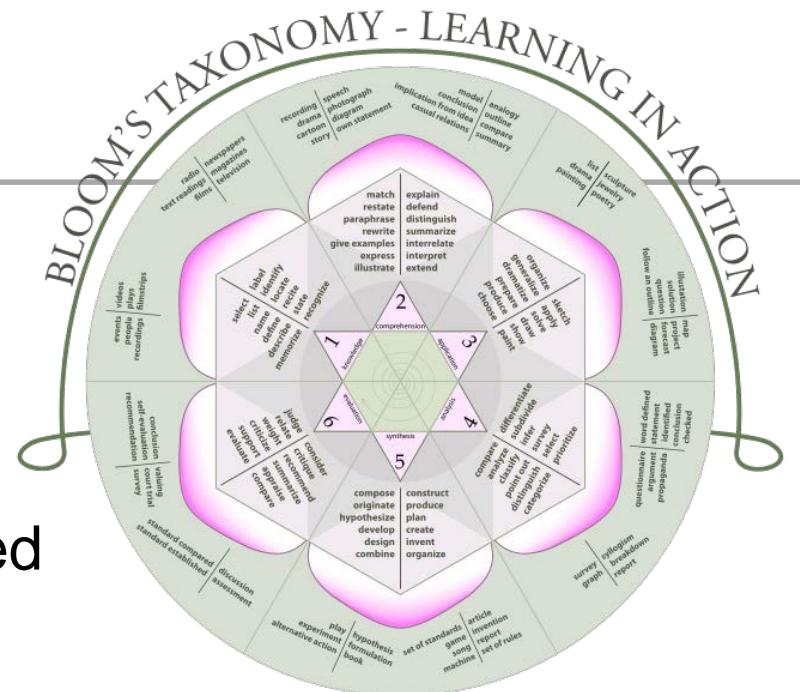
Bloom's taxonomy

→ **Bloom's Taxonomy** is a classification of <u>learning objectives</u> within education proposed in 1956 by a committee of educators chaired by <u>Benjamin Bloom</u>, who also edited the first volume of the standard text, *Taxonomy of educational objectives: the classification of educational goals*[1]

→ **Balance between different learning styles/activities**

Skoltech Learning Outcomes for MSc Programs

- 1. Disciplinary Knowledge and Reasoning
  - Mathematics and science
  - Applied science and engineering
  - Innovation and entrepreneurship
  - **Interdisciplinary thinking**
  - **Contemporary methods and tools**
- 2. Thinking Beliefs and Values
  - **Cognition and modes of reasoning**
  - **Attitudes and learning**
  - Ethics, equity and other responsibilities
- 3. Relating to others: communications and collaboration
  - **Communications and working in international settings**
  - **Teamwork**
  - **Collaboration and change**
- 4. Leading the Innovation Process
  - Making sense of the global, societal, environmental and business context
  - **Visioning – inventing new technologies**
  - **Visioning – conceiving and designing**
  - **Delivering on the vision – implementing and operating**
  - **Delivering on the vision – entrepreneurship and enterprise**

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Types of Learning Spaces

→ Physical vs Virtual

→ Focus on Physical learning spaces with integrated technology

→ The connection to KTH and MIT early on (1990 to 2000)

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From Learning styles => type of spaces

→ From a list of 30+ learning activities we came up with 4 main categories of learning spaces

→ 1. Performance Space

→ 2. Team Space

→ 3. Informal Social Space

→ 4. Reflective Spaces

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1. Performance Spaces

→ Like auditorium, big seminare rooms,,,for

- → Lectures

- → Presentations

- → Seminaries

- → Colloquiums

- → Ceremonies, celebrations

- → Thesis defense

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2. Team Space

→ Like group&seminare rooms, laboratories for

   → Group work, workshops

   → Discussions, seminars

   → Mentoring

   → Design studios

   → Lab work

   → Prototyping

   → Exhibitions

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3. Informal Social Space

→ Like open spaces, café, entrée zones rest areas for

> → Meeting people
>
> → Walk and talk
>
> → Take a "fika" (Swedish for coffee break)
>
> → Mentoring
>
> → Exhibitions
>
> → Celebrations
>
> → Party time

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4. Reflective Spaces

→ Like library reading rooms, individual spaces for

- → Reading

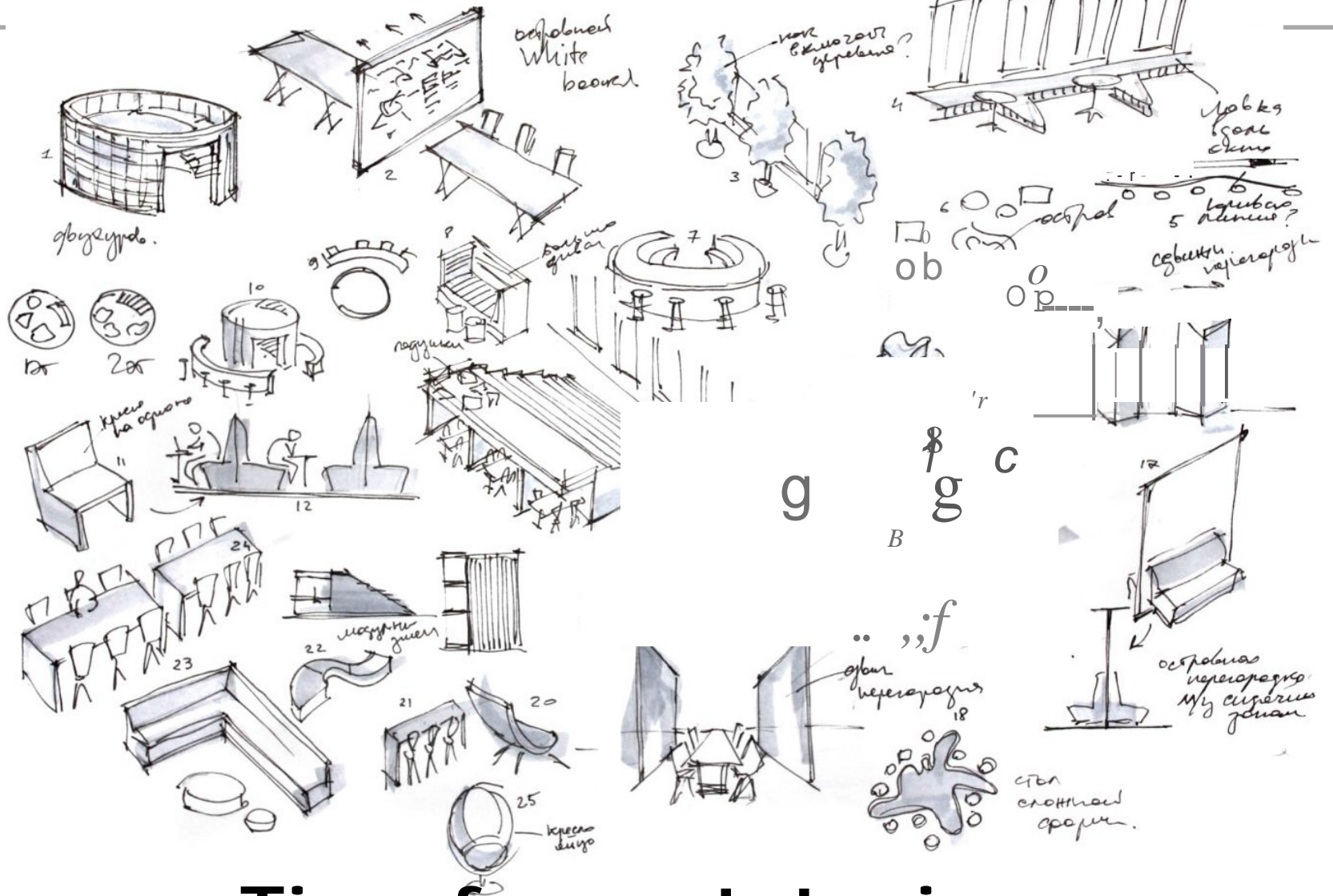- → Working quietly "alone together"

- → Contemplation

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The design process!

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The design process!

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The design process!

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Time for prototyping

Cohort space 2 plan

Class room 10-12 seats

Print area

Class room 10-12 seats

Class room
up to 15 seats

Stu9ent me_f ing r9om
10-12 seats

Student meeting
room 10-12 seats
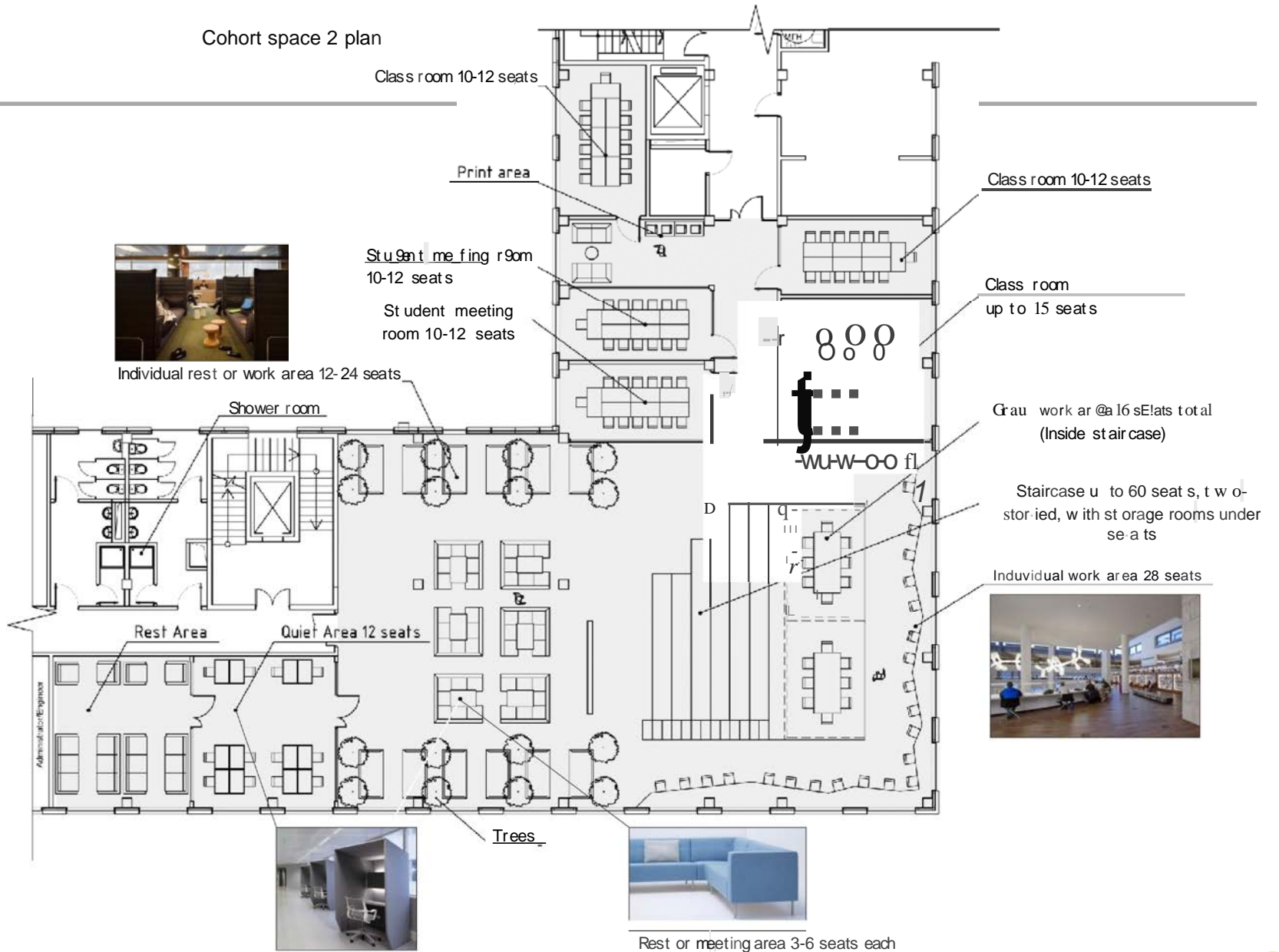
Individual rest or work area 12-24 seats

Shower room

Grau work ar@a l6 sE!ats total
(Inside staircase)

Staircase u to 60 seats, two-
storied, with storage rooms under
seats

Induvidual work area 28 seats

Rest Area

Quiet Area 12 seats

Trees

Rest or meeting area 3-6 seats each

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Examples
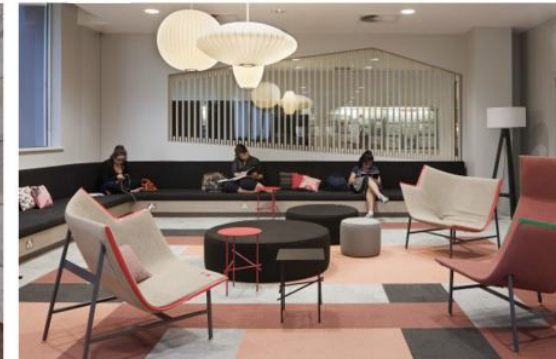
Make it real
And test it!
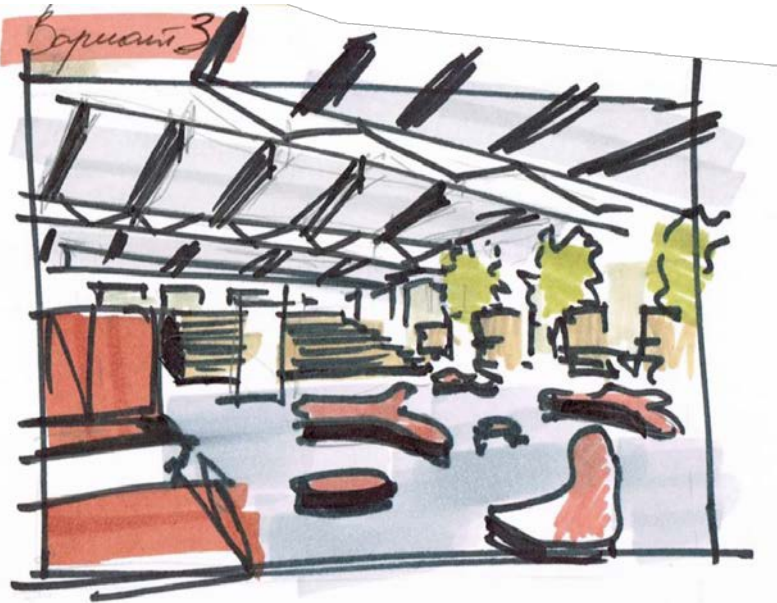
Masterskaya the Rapid Prototyping Lab

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Summary of goals 2012-15

→ Skoltech is a new type of international university in Russia, Moscow with focus on Research, Technology and Innovation

→ Small scale with focus on the bridge between research and innovation.

→ Graduate education is integrated in the (non department) Center for Research Education and Innovation CREI model

→ One campus in a large interconnected building within the Skolkovo Innovation Center

→ **Learning Spaces will support a rich set of learning activities**

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