A (random) walk to the future of higher education in Portugal

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Higher education in 2030 or how to prepare for society/jobs that do not yet exist?
How should we shape learning and teaching in higher education when all the info, the best contents & professors are available online?

What will be unique of universities in the landscape of higher education?

What will be the role of the faculty members in the learning/teaching processes of the future?

The students
Curricula and Research
The faculty members
“The future is already here – it's just not evenly distributed.”
William Gibson
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The students
New Vision for Education

To thrive in the 21st century, students need more than traditional academic learning. They must be adept at collaboration, communication and problem-solving, which are some of the skills developed through social and emotional learning (SEL). Coupled with mastery of traditional skills, social and emotional proficiency will equip students to succeed in the swiftly evolving digital economy.

In 2015, the World Economic Forum published a report that focused on the pressing issue of the 21st-century skills gap and ways to address it through technology (New Vision for Education: Unlocking the Potential of Technology). In that report, we defined a set of 16 crucial proficiencies for education in the 21st century. Those skills include six “foundational literacies”, such as literacy, numeracy and scientific literacy, and 10 skills that we labelled either “competencies” or “character qualities”. Competencies are the means by which students approach complex challenges; they include collaboration, communication and critical thinking and problem-solving. Character qualities are the ways in which students approach their changing environment; they include curiosity, adaptability and social and cultural awareness (see Exhibit 1).

In our current report, New Vision for Education: Fostering Social and Emotional Learning through Technology, we follow up on our 2015 report by exploring how these competencies and character qualities do more than simply deepen 21st-century skills. Together, they lie at the heart of SEL and are every bit as important as the foundational skills required for traditional academic learning. Although many stakeholders have defined SEL more narrowly, we believe the definition of SEL is evolving. We define SEL broadly to encompass the 10 competencies and character qualities.

As is the case with traditional academic learning, technology can be invaluable at enabling SEL. The advantage of SEL as we explore in Chapter 1 of the report, social and emotional skills are critical to the workforce of the future. The kinds of skills that SEL addresses, such as problem-solving and collaboration, are increasingly necessary for the labour market. According to one estimate, 65% of children entering grade school will ultimately work in jobs that don't exist today, putting creativity, initiative and adaptability at a premium. Another study shows that jobs are increasingly.

## Top 10 skills

<table>
<thead>
<tr>
<th>in 2020</th>
<th>in 2015</th>
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<tbody>
<tr>
<td>1. Complex Problem Solving</td>
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<tr>
<td>2. Critical Thinking</td>
<td>2. Coordinating with Others</td>
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<tr>
<td>3. Creativity</td>
<td>3. People Management</td>
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<td>4. People Management</td>
<td>4. Critical Thinking</td>
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<tr>
<td>5. Coordinating with Others</td>
<td>5. Negotiation</td>
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<tr>
<td>6. Emotional Intelligence</td>
<td>6. Quality Control</td>
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<td>7. Judgment and Decision Making</td>
<td>7. Service Orientation</td>
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Source: Future of Jobs Report, World Economic Forum
Long professional careers (+40 years) with many changes
Need a toolkit for (unknown) professional challenges
Universities as the go to institution for lifelong learning

The students
Students are significantly and qualitatively different from the students at IST 30 years ago.

The students
Has teaching and learning changed as dramatically as students (and technology) have?
Two personal examples
(and what I have learned)

The students
Physics and Technology for Future Presidents
An Introduction to the Essential Physics Every World Leader Needs to Know

Richard A. Muller
1st year Physics Architecture
*No person left behind*

Learning physics from critical reading/writing essays/weekly quizzes on issues in the media

Not much math or equations but lots of *back of the envelope* calculations

Training for *physical intuition*
Computational Physics + Java
2nd year LEFT 2004 - 2006
ACM Objects First approach

Open Source Physics (Java based)
http://www.opensourcephysics.org/

Warm up mini projects
Classroom used for project co-design and discussion
 Semester long open ended project
Final presentation + website (in 2004)
Feedback
Short turnover times
Project oriented
Working in teams
Projects that students connect to/co-design
Tech (user) savvy
Instant gratification + non trivial rewards

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Curricula and Research
STEM + ARTS = STEAM
One of the main trends is to enhance the so called *campus experience*
Improve student life

Massive investments in infrastructures to support life of students on campus [dorms, libraries, study/labs rooms, sports, dining]
What is truly unique?

Networking and interacting face to face with peers

Face to face connection with diverse top experts/faculty members

Research experience
Facilitate networking and interactions between students, and with faculty members.

Campus life and architecture | classroom interactions & formats | curriculum & degree design | on campus extracurricular activities | social media | diverse pool of students
Rethink physical environment for informal and formal interactions + collaborative + team workspaces
Breaking the barriers to enhance the student-faculty interactions

Less formal *ex cathedra* interactions

More informal (and intense) interactions
[office hours, fora, discussions, project work]
UROP @ MIT
Provide academic credit for research work at all levels

My personal experience
Started doing research as 3rd year student
Supervised more than 20 undergrads
Enhanced the students’ academic performance (no credits, though)
Contributed to the buzz in the group
Novel high risk research directions first explored by undergrads
More mix (students/topics/degrees/background)
More flexibility and uniqueness in the students’ paths
More research-like activities
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The faculty members
Ways of Curating

Hans Ulrich Obrist

‘THE MAN WHO MADE CURATING AN ART’

NEW YORK OBSERVER
The (good and the bad of the) generation gap

student intake will always be at 18 years old

average age of permanent faculty between 50 and 52.5
[assuming uniform distribution of ages between 30-35 and 70]

The faculty members
Involve younger non permanent faculty/researchers in the teaching activities to facilitate connections with students

The faculty members
Can we expect constant pedagogical innovation from the permanent faculty members?

The faculty members
Rethink/remember what it means to be a tenured professor

Tenure is an important cornerstone of universities: it is a key guarantee of academic freedom, scientific independence, free thinking/speech

The faculty members
What is the meaning of *tenure* in terms of academic responsibility & citizenship?

The faculty members
A tenured professor must permanently exert his/her academic freedom, scientific independence, free thinking/speech. This also means to innovate, to be non-conformist, to bring new ideas, to inspire the new generations. As scholars, this includes teaching.
Curators
Non-conformists engaged in a continuous innovation process, both in research and in teaching
Source of inspiration/role models for the students

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Not like up to now! Closer to the learning profiles of the students

Social interactions
Diverse knowledge paths
Research immersion

Curators
Originals
Role models & mentors

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