

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?

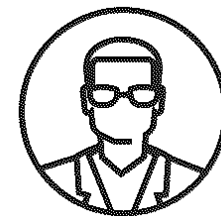
What will be the role of the faculty members in the learning/teaching processes of the future?



The students



Curricula and Research



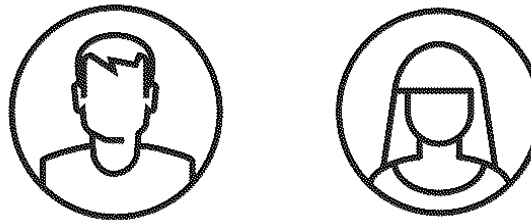
The faculty members

“The future is already here –
it's just not evenly distributed.”
William Gibson

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The students

21st-Century Skills

Foundational Literacies

How students apply core skills to everyday tasks



1. Literacy



2. Numeracy



3. Scientific literacy



4. ICT literacy



5. Financial literacy



6. Cultural and civic literacy

Competencies

How students approach complex challenges



7. Critical thinking/
problem-solving



8. Creativity



9. Communication



10. Collaboration

Character Qualities

How students approach their changing environment



11. Curiosity



12. Initiative



13. Persistence/
grit



14. Adaptability



15. Leadership



16. Social and cultural awareness

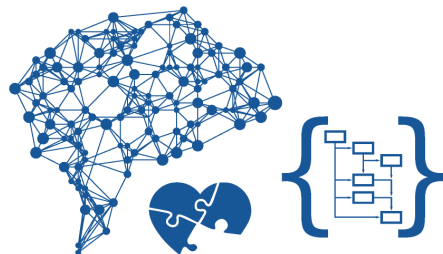
Lifelong Learning

Source: New Vision for Education, World Economic Forum 2016

Top 10 skills

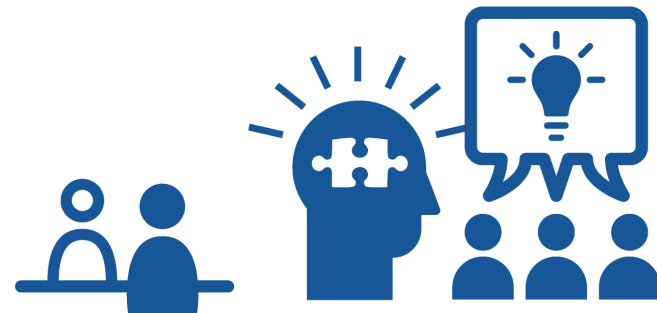
in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

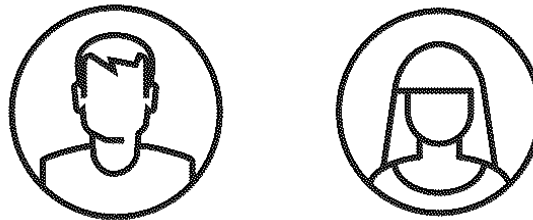


in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity

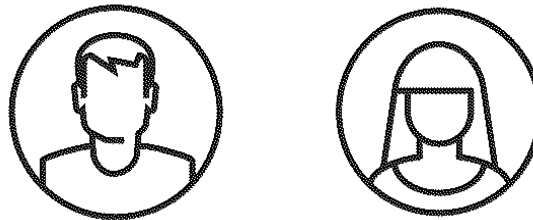


Long professional careers (+40 years) with many changes
Need a toolkit for (unknown) professional challenges
Universities as the *go to* institution for lifelong learning

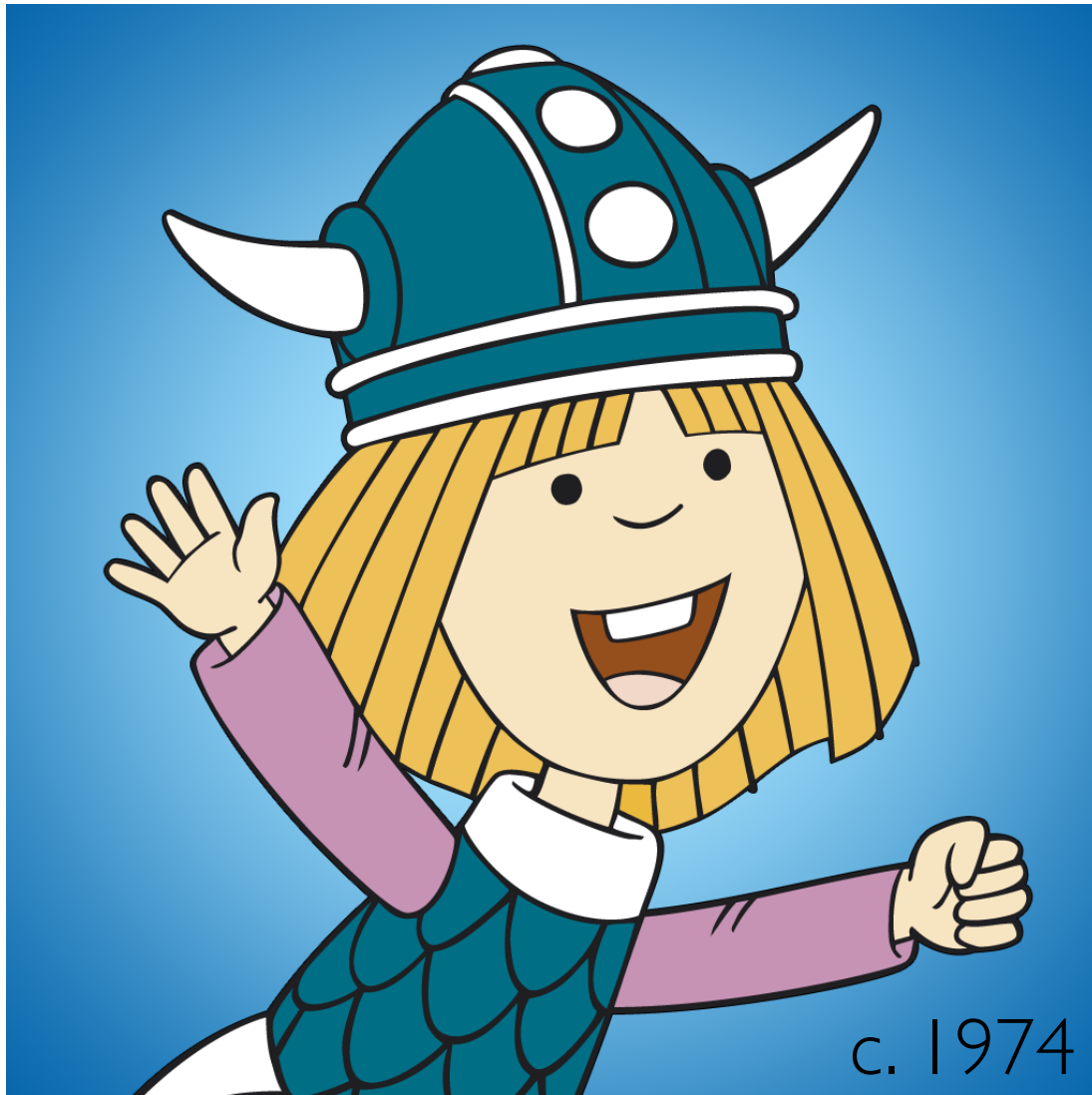


The students

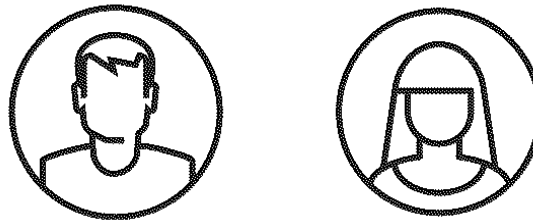
Students are significantly and qualitatively different from the students at IST 30 years ago



The students



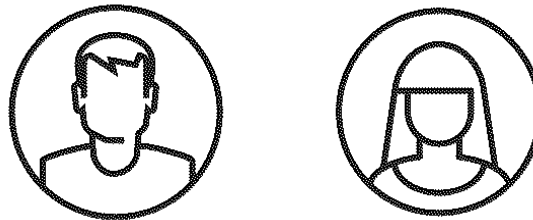
Has teaching and learning changed as dramatically as students (and technology) have?



The students



Two personal examples (and what I have learned)



The students



Richard A. Muller

Physics and Technology for Future Presidents

An Introduction to the
Essential Physics
Every World Leader
Needs to Know

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

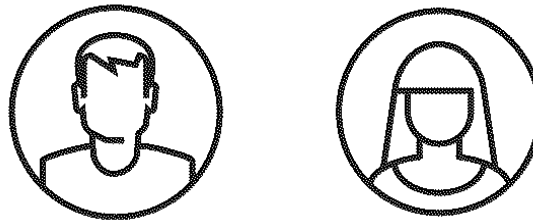
ACM *Objects First* approach

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



The students

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Curricula and Research

STEAM

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]

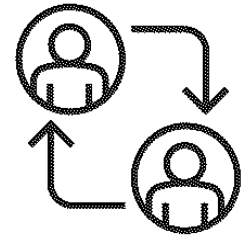






What is truly unique?

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



Research

More mix (students/topics/degrees/background)
More flexibility and uniqueness in the students' paths
More research-like activities



Curricula and Research

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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



The faculty members

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

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



Social interactions
Diverse knowledge paths
Research immersion

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



Curators
Originals
Role models & mentors