The Teacher of the Future

Dr. ir. Alexandru Iosup, representing a whole team*

* Education is teamwork. Many thanks, team. Inaccuracies/mistakes are mine, not team’s.
Major Technical University in the Netherlands (Top-20 in the World*)

- “P-in-een” of an important BSc track <40%
- Completion “in time” of the BSc <35%

Exercise: The Blame Game

- Team work, first 2 minutes
  1. Form team of 2-3 persons
  2. Think about own experience
  3. Convince your team before proposing an answer

- Open discussion, next 2 minutes
  - Tell everyone the answer

Q: Who is responsible for the current outcome of higher education?

Voting on best answer
We’re In This Together (My Answer)

- New generation of students
- New types of students, especially multi-culti
- It’s not you, it’s me
- New ambition of our faculty, but cannot select students

https://quotablequoteunquote.files.wordpress.com/2008/08/walkingcomputergeek.jpg
We’re In This Together (My Answer)

• New generation of students

• New types of students

The main challenges for the future?

Every student counts!
Every student is different!

• New ambition of our faculty, but cannot select students

Let’s Extrapolate to Europe:
The Workforce Gap in ICT

Source: e-Skills for Jobs in Europe, 2014
Let’s Extrapolate to Europe: The Workforce Gap in ICT

The main challenges for the future?

Every student counts!
Every student is different!

Source: e-Skills for Jobs in Europe, 2014
Let’s Extrapolate to Europe: The Workforce Gap in ICT

The main challenges for the future?

Every student counts!
Every student is different!

Q: Who is the Teacher of the Future?

Source: e-Skills for Jobs in Europe, 2014
Who Is the Teacher of the Future?

One Iteration
Who Is the Teacher of the Future?

1. The Hierarchy of Needs for Teachers

2. A Vision for Education

3. An Approach for Education
Who Is the Lecturer of the Future?

1. The Hierarchy of Needs for Teachers

2. Every Student Counts! A Vision for Education

3. Gamification: An Approach for Education
Who Is the Teacher of the Future?

1. The Hierarchy of Needs for Lecturers

2. Every Student Counts! A Vision for Education

3. Gamification: An Approach for Education
Maslow’s Hierarchy of Needs (1943)

- Physiological
- Safety
- Affection/Belonging
- Status/Esteem
- Self-Actualize

Abraham Maslow

Maslow’s Hierarchy of Needs (1943)

- **Survival Needs**
  - Physiological

- **Safety**

- **Affection/Belonging**

- **Status/Esteem**
  - Internal
  - External

- **Self-Actualize**
  - Cognitive
  - Creative

- Abraham Maslow

Maslow’s Hierarchy of Needs (1943) + Kenrick et al. (2010)

- **Physiological**
- **Safety**
- **Affection/Belonging**
- **Status/Esteem**
- **Self-Actualize**
- **Parenting**
- **Mating**
- **Growth Needs**
Exercise: The Imitation Game
Exercise: The Imitation Game

Q: How would a hierarchy of needs for teachers look like?

- Physiological
- Safety
- Affection/Belonging
- Status/Esteem
- Self-Actualize
- Mating
- Parenting

Growth Needs

Survival Needs
The Hierarchy of Needs for Teachers
Alexandru Iosup (2015)
The Hierarchy of Needs for Teachers
Alexandru Iosup (2015)

Parenting Needs
Directing a New Education Culture
Education Family

Growth Needs
Personal Optimum
Status/Esteem

Survival Needs
Affection/Belonging
Control

Basics
The Hierarchy of Needs for Teachers (2015)

- We all know about the basics of teaching

- But:
  - Need to improve the BKO, especially for new conditions
  - Need a “diurnal” cycle (sleep=research)
  - Need much better content-authoring tools, especially for new conditions (MOOCs, blended, ...)

Survival Needs

Basics
The Hierarchy of Needs for Teachers (2015)

- Address threats, better chances of success

- But
  - Need **tools** for simple, online learning analytics (Excel?!)
The Hierarchy of Needs for Teachers (2015)

- Social needs

But

- Need a culture of “sharing is caring”

- Need a culture of professional education

- Need **tools** for management of course teams (Blackboard can be too slow, Facebook could break privacy laws)
The Hierarchy of Needs for Teachers (2015)

- Internal feeling of mastering education
- External status, recognition, glory

- But
  - Need **tools** for detailed learning analytics
  - Need governance to recognize value of education
The Hierarchy of Needs for Teachers (2015)

- Learn and create new education techniques

- But
  - Need to formulate personal vision
  - Need environment to create
  - Need **tools** to validate progress
The Hierarchy of Needs for Teachers (2015)

• Teach the teachers!

• But
  • The Education Genealogy Project
  • Need **tools** to advise and collaborate with friendly teams
  • Need **tools** for detailed analytics
  • Need **governance** support
The Hierarchy of Needs for Teachers (2015)

- Establish **a new education culture**:  
  - In research, **1,000 citations is the golden standard**

- But  
  - Need **tools** to create at large scale
  - Need **governance** support and **involvement**
The Hierarchy of Needs for Teachers
Alexandru Iosup (2015)

- **Survival Needs**
  - Course objectives
  - Monitoring
  - Trade-offs

- **Growth Needs**
  - All
  - Teach teachers
  - Learn
  - Create
  - Mastery
  - Ranking
  - Sharing
  - Joining

- **Parenting Needs**
  - Education
  - Family

- **Personal Optimum**
  - Status
  - Esteem

- **Affection/Belonging**

- **Control**

- **Basics**

- **Directing a New Education Culture**
Who Is the Lecturer of the Future?

1. The Hierarchy of Needs for Lecturers

2. Every Student Counts! A Vision for Education

3. Gamification: An Approach for Education
2014: How to spend 1 Billion?  
A: ICT and Gamification for education!

Q: What is gamification?  
A: The use of techniques designed for gaming in non-gaming settings, e.g., in education.

http://goo.gl/V97zSW
2014: How to spend 1 Billion?
A: ICT and Gamification for education!

What is the intuition behind gamification?
How can gamification be used at TUD?
Does it work in practice?

http://goo.gl/ILSNeb
Do You Know This Person?
Designing a course is like creating a complex puzzle.
I in the Box
I in the Box
I in the Box
I in the Box
I in the Box
I in the Box
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Content Unlocked!
• Richard Bartle’s “Players who suit MUDs”, Myers-Briggs, etc.
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Exercise: The “Who Are You?” Game

Q: Which best describes you?

- **Acting**
  - **Winners**: competitive/single-winner challenges
  - **Achievers**: more/more difficult challenges

- **Interacting**
  - **Socializers**: team/discussion-based challenges
  - **Explorers**: open/creative challenges

- **Players**
  - Richard Bartle’s “Players who suit MUDs”, Myers-Briggs, etc.
Assessment That Motivates!

10,000 points for a 10
+50 for good activity
+1,000 for most challenging activity

Badges, unlocked content
Designing a course is like creating a complex puzzle.
Does gamification work?
Gamification works!

Gamification Works!

**Extra work due to gamification, relative to traditional [\% all students]**

- Gamified, BSc 2014
- Gamified, BSc 2013
- Gamified, BSc 2012
- Gamified, BSc 2011
- Traditional, BSc 2010

Bonus: Every year, we make the course more difficult.
What Happens When A Student Does Not Like the Course Topic?

I want to thank you for showing that even though I'm not that good at written exams, I still can excel at other points in my study. I'd love to have a copy of my badge, as physical reminder of a course that made me eager to learn about things. Even when some of those things will never really have my interest.

This course, and the way it was given, learned me a few things about what motivates me, and only for that reason it was totally worth getting up for every lecture.
Designing a course is like creating a complex puzzle
Gamification works!

Lumaxart Trophy Winner
Gamification works!

TU Delft Masterclass 2015: 8 new courses

TU Delft Data Science: ICT tools to help out

Who Is the Teacher of the Future?

1. The Hierarchy of Needs for Lecturers

2. Every Student Counts!
   A Vision for Education

3. Gamification Works!
Who Is the Teacher of the Future?

1. The Hierarchy of Needs for Lecturers

2. Every Student Counts! A Vision for Education

3. Gamification: An Approach for Education
Every Student Counts! (my vision)

1. Enable “smart stuff”, both individually and in teams.
2. Achieve all learning objectives, including learning the process.
3. Activate all students to deepen vital skills, for a lifetime.
4. Educate great professionals, but also great citizens: to shoulder the society, to educate others, to be responsible and ethical.
5. Develop, validate, and share the education techniques that enable points 1—4 in *your* environment.

Exercise: The Critical Thinking Game – What is “smart stuff”?

- Team work, first 2 minutes
  1. Think about own experience
  2. Convince your team before proposing an answer

- Open discussion, next 2 minutes
  • Tell everyone the answer

**Q:** What would be for you “smart stuff”?  
Voting on best answer
Q: What’s in a name?
A: Over 250,000,000 active players

Social Gaming =
100,000k+ social players

1. Mechanics
   Explore, do, learn, socialize, compete +

2. Dynamics, incl. Rewards
   Player stats, badges, others +

3. Game Content*
   puzzles, challenges, extra-projects, culture

* Art class pending.
Our Work At GamificationU, >10+ Operational Years Since 2007

- **B.Sc. Courses**
  - TI140x Computer Organization (5 years, ongoing)
  - Bachelorseminarium (5 years, evolving form, I stopped 2013)

- **M.Sc. Courses**
  - IN4392 Cloud Computing (3 years, co-teaching)
  - IN4391 Distributed Computing Systems (2 years, new course)
Content Looks the Same …
Except It’s Not!

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Industry

state-of-the-art

Topics touch today’s research

Social relevance

Photos: (left) courtesy Google Inc. (middle) http://www.flickr.com/photos/dimitrisotiropoulos/4204766418/ (right) personal library of A. Iosup.
Innovation [2/3]: through Diverse Gamification Elements

- Too many to list here
  - Scoring system is but one element
  - Badges? Only for B.Sc., some “random” Manga cum laude

- Onboarding (dynamics)
  - Entry quiz
  - Story every lecture

- Social Learning (dynamics)
  - In-class teams
  - Self-study as team effort
  - Involve Winners and Achievers in class
  - Involve Winners and Explorers in self-study

- Different player types
  - Ladders, ranking, end-lecture quiz: mostly for Winners
  - Content unlocking (dynamics): Explorers and Achievers

2014: How to spend 1 Billion?
A: ICT and **Gamification** for education!

Q: But, Alexandru, surely not every course can use **gamification**!? I mean, there is no technique for my concept / activity / entire course...
A: Wonderful Advances in Gaming, Last 10 Years: diverse individual challenges
A: Wonderful Advances in Gaming, Last 10 Years: diverse social challenges