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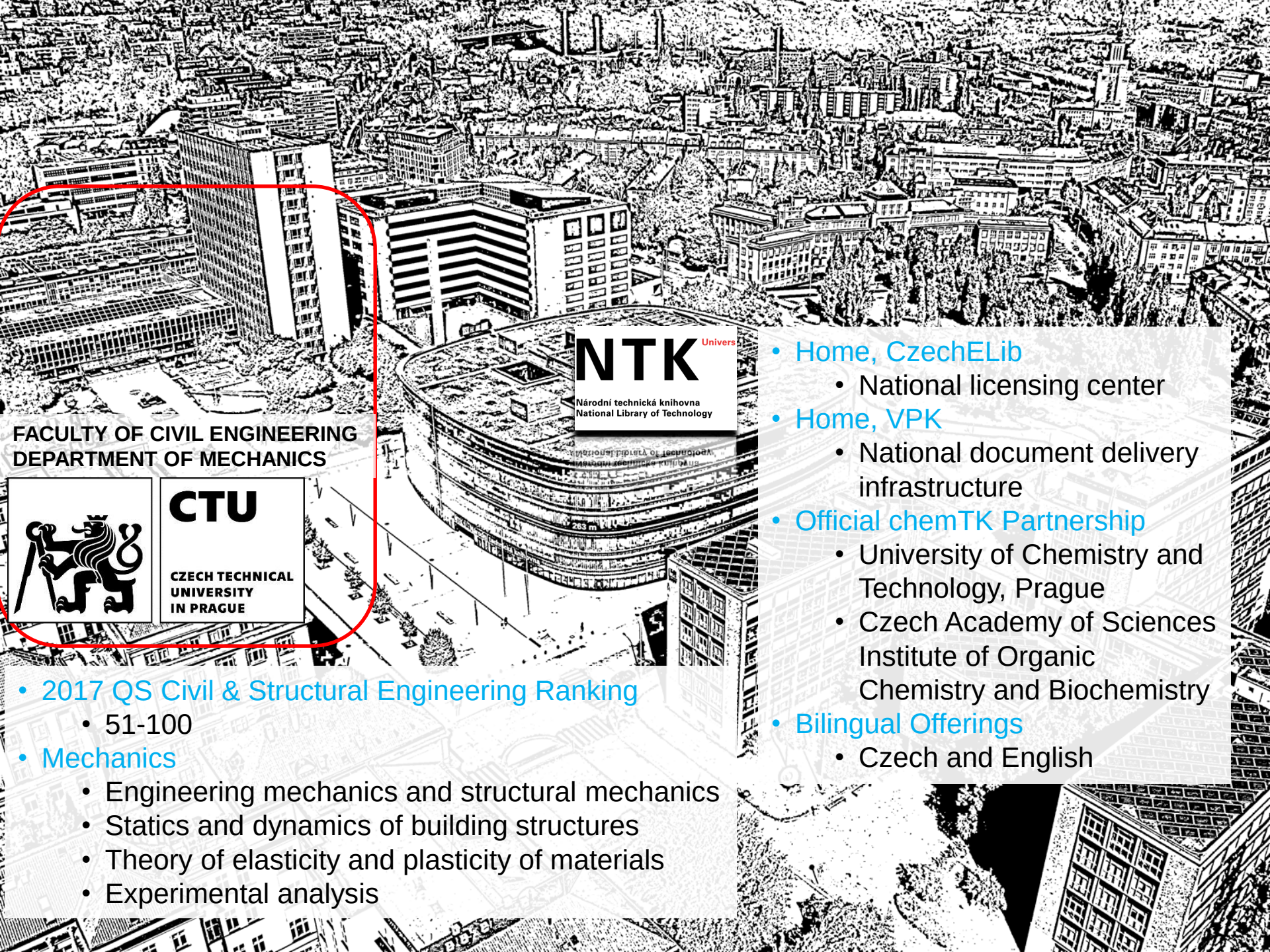
National Library of Technology

Letting Traditional Boundaries Blur:

A Case Study in Co-Developing STEM “Excellence” Courses

S. Krueger, 38th Annual IATUL Conference Bozen 2017
19.6.2017



FACULTY OF CIVIL ENGINEERING
DEPARTMENT OF MECHANICS

CTU
CZECH TECHNICAL UNIVERSITY IN PRAGUE

NTK
Univers
Národní technická knihovna
National Library of Technology

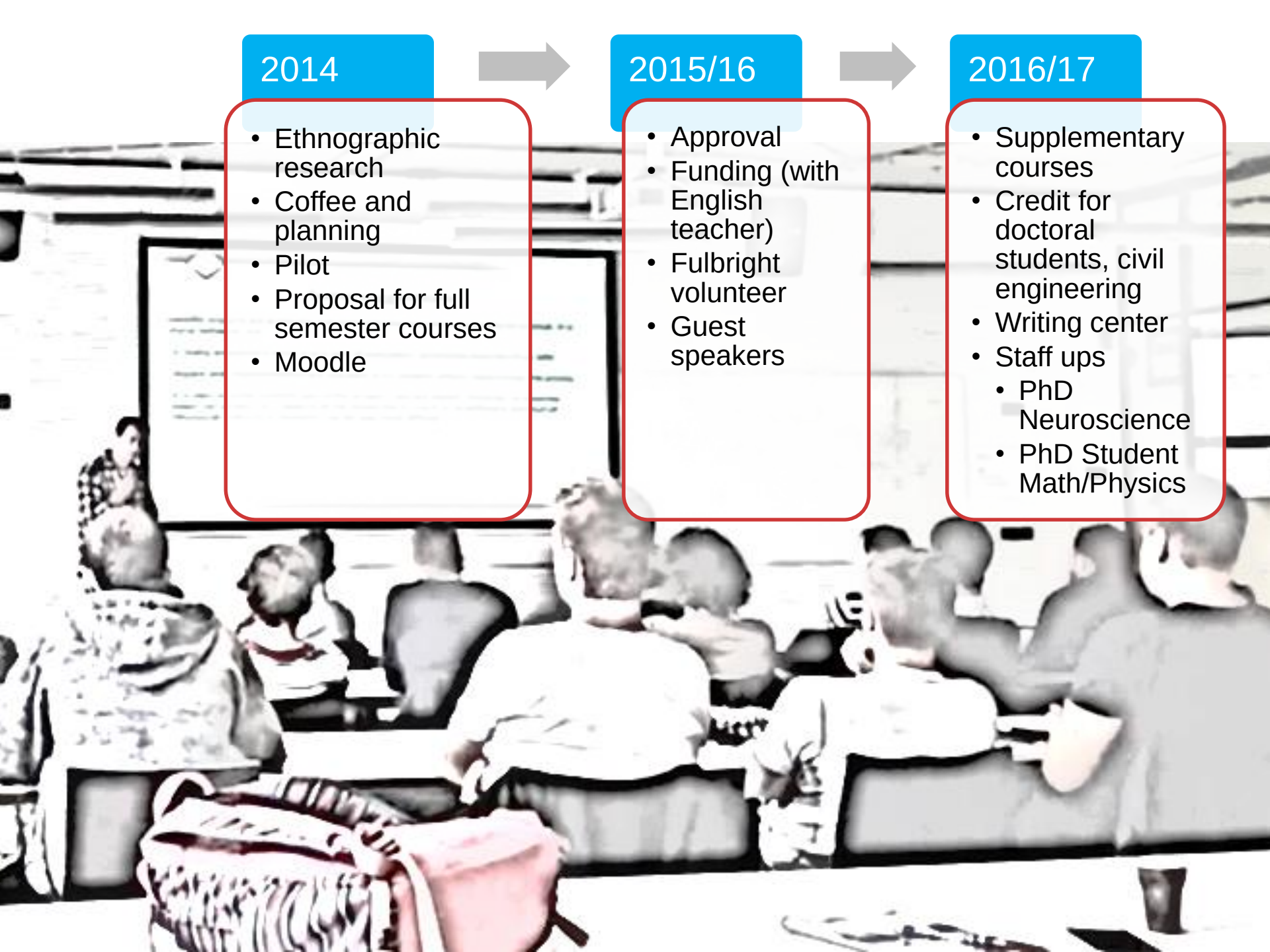
- 2017 QS Civil & Structural Engineering Ranking
  - 51-100
- Mechanics
  - Engineering mechanics and structural mechanics
  - Statics and dynamics of building structures
  - Theory of elasticity and plasticity of materials
  - Experimental analysis

- Home, CzechELib
  - National licensing center
- Home, VPK
  - National document delivery infrastructure
- Official chemTK Partnership
  - University of Chemistry and Technology, Prague
  - Czech Academy of Sciences Institute of Organic Chemistry and Biochemistry
- Bilingual Offerings
  - Czech and English

"I really appreciate what you have been doing here. It is very special and something I have been looking for a long time. The Czech academic environment lacks of such courses. The situation has changed recently, I guess, yet there are many things to be done in the future." – *student evaluation, 2017*

UNIFIER: QUEST FOR EXCELLENCE (RIGOR!)

GOAL: STUDENT, RESEARCHER SUCCESS



2014

- Ethnographic research
- Coffee and planning
- Pilot
- Proposal for full semester courses
- Moodle

2015/16

- Approval
- Funding (with English teacher)
- Fulbright volunteer
- Guest speakers

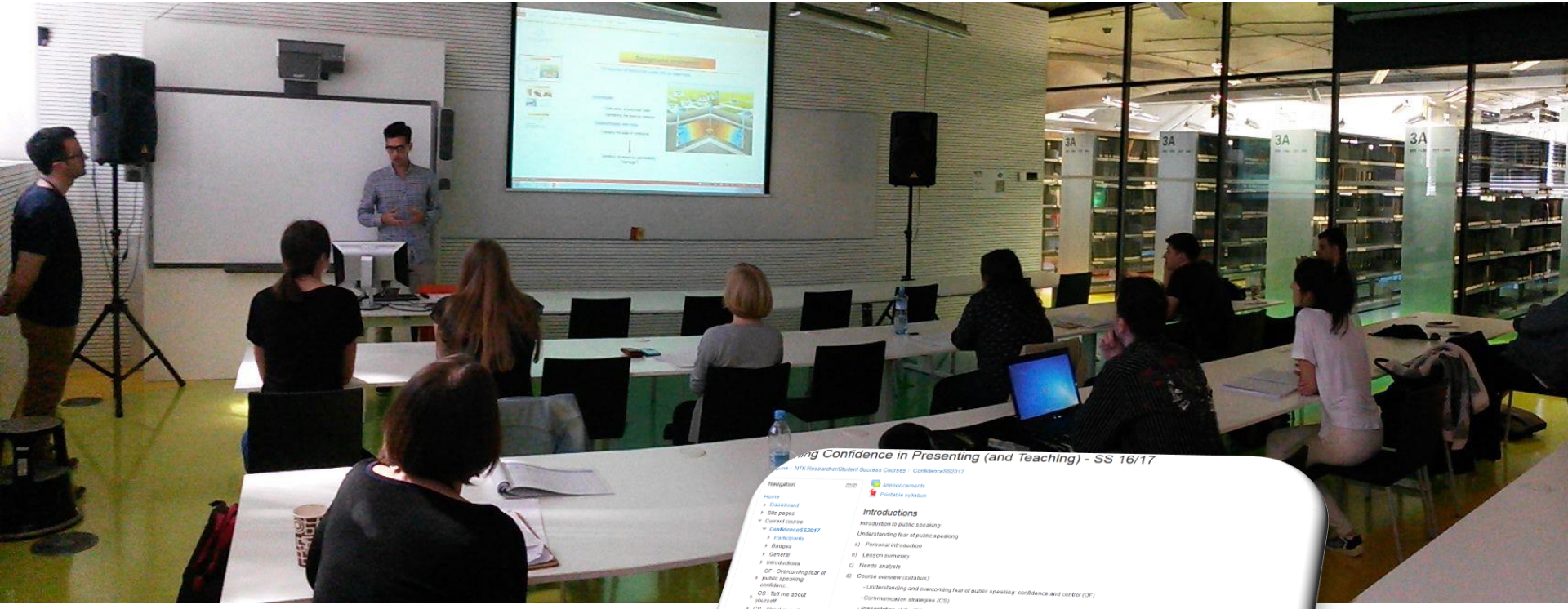
2016/17

- Supplementary courses
- Credit for doctoral students, civil engineering
- Writing center
- Staff ups
  - PhD Neuroscience
  - PhD Student Math/Physics

Content Highlights

- Scientific Writing
  - All five IL STEM standards incorporated
  - Depth “on demand”
- Presenting
  - Two semesters: gaining confidence, scientific oral presentations

https://moodle.ntkcz.cz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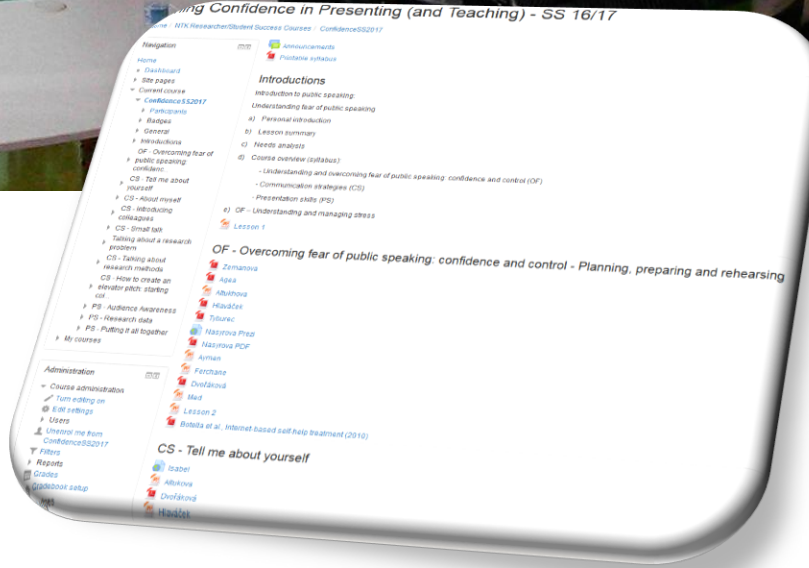

ing Confidence in Presenting (and Teaching) - SS 16/17
Navigation
Home
Dashboard
Site pages
Current course
ConfidenceSS2017
Participants
Badges
General
Introductions
OF - Overcoming fear of public speaking: confidenc
CS - Tell me about yourself
CS - About myself
CS - Introducing colleagues
CS - Small talk
Talking about a research problem
CS - Talking about research methods
CS - How to create an elevator pitch: starting col
PS - Audience Awareness
PS - Research data
PS - Putting it all together
My courses
Administration
Course administration
Turn editing on
Edit settings
Users
Unenrol me from ConfidenceSS2017
Filters
Reports
Grades
Gradebook setup
Introductions
Introduction to public speaking:
Understanding fear of public speaking
a) Personal introduction
b) Lesson summary
c) Needs analysis
d) Course overview (syllabus):
- Understanding and overcoming fear of public speaking: confidence and control (OF)
- Communication strategies (CS)
- Presentation skills (PS)
e) OF - Understanding and managing stress
Lesson 1
OF - Overcoming fear of public speaking: confidence and control - Planning, preparing and rehearsing
Zemanova
Agea
Altukhova
Hlavacek
Tiburec
Nasirova Prezi
Nasirova PDF
Ayman
Ferchane
Dvořáková
Med
Lesson 2
Botella et al., Internet-based self-help treatment (2010)
CS - Tell me about yourself
Isabel
Altukova
Dvořáková
Hadlek

Individual follow-up
(or: where the rubber meets the road)

[SK email to student, 26.4.2017] Sorry for this long email; I think we should meet in person to go over questions, but...if you have time, please work a little on your paper before we meet.

Your experiment was interesting, but you need to do still quite a lot of work to make the article logical and understandable to others:

1. I **only edited the English in the abstract** for now, because the rest of the text needs quite some work on your side. It's no problem for me to edit the rest of the English, but you must clean up the text yourself before I do that.

2. I have attached here **sample author guidelines for a journal that publish articles like yours**. Please READ THESE and fix your text, using the comments I have provided, before I do more edits.

Basically, you need to make sure the article has the **appropriate structure** (pp. 7-8, author guidelines). This is missing in your case. I can tell where the things are, but YOU as the author must include the appropriate headings, etc.

3. Note that this journal has mandatory highlights: 3-5 bullet points. I suggest you write some highlights for yourself to help you clarify what you are trying to say in your article. I can tell you did the experiment and that you somehow wish to link results not only to the theory but to *[X/excluded here for privacy]*, but you don't explicitly state this. You MUST do this.

4. You should **check the citations** and I recommend putting them into the format suggested in the author guidelines. And include DOIs for everything which has a DOI.

Areas we cover, (ideally) saving scientific mentors time and effort

- Publication, submission guidelines
  - Awareness, proper formats
- Articles, presentations
  - Structure and flow
- Language
- Organization
  - Tools and techniques (ranging from citations to data)
- Neutral “ear” for life, career planning issues

LESSONS FROM THE FIELD

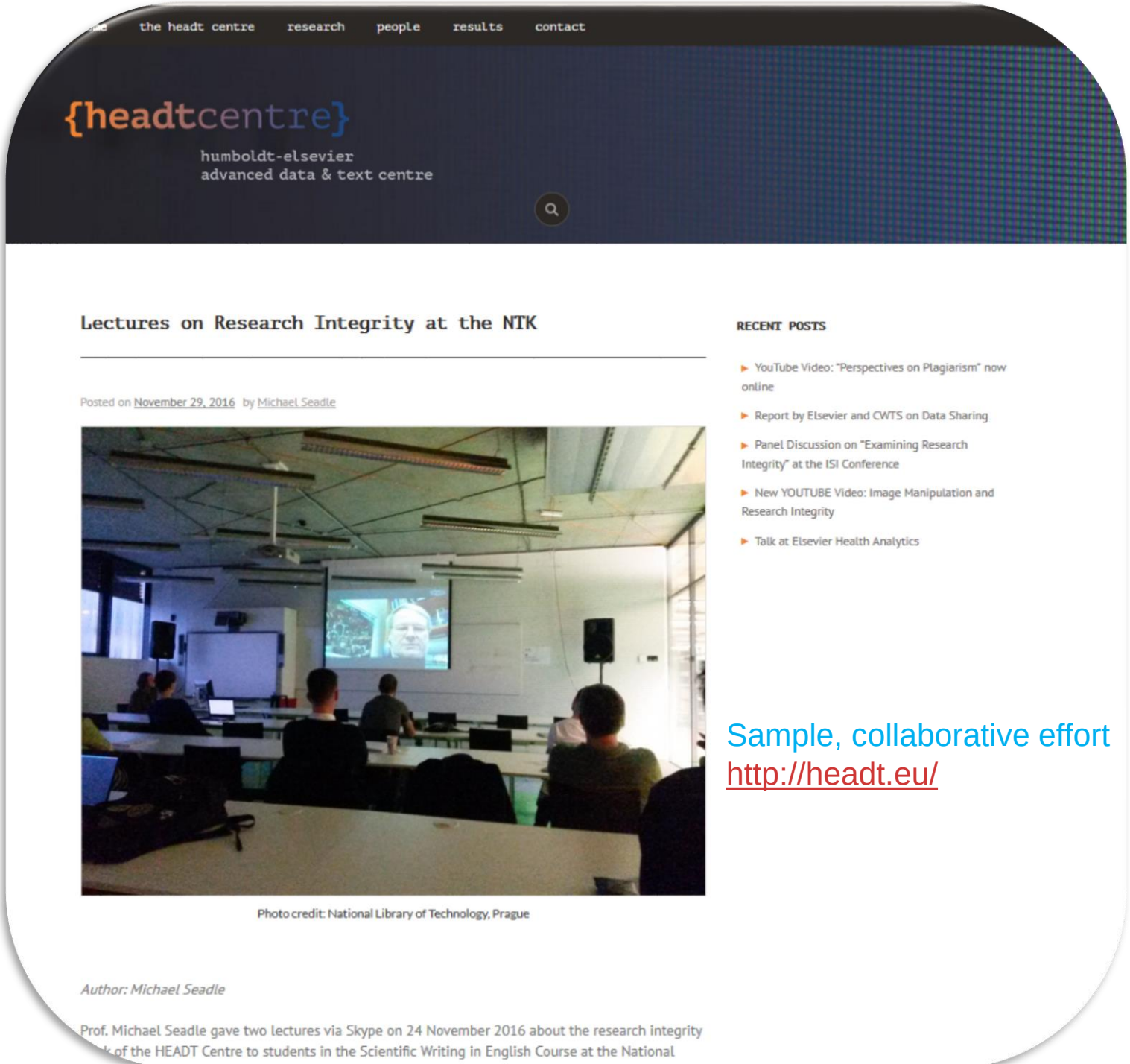
Catalysis, not embedding (?)

Spangler, Steve. [Sick Science!]. (19.1.2011). *Color Changing Milk - Sick Science! #018*. [Video File]. Retrieved from: https://www.youtube.com/watch?v=6T3C-0-Djas

Embrace surprising effects

- No easy bandaids
- “Mushrooming”; why not collaboration instead?
- Fluid funding, curricula, staffing
- New internal training directions
  - Scholarship and publishing
  - Research methods
  - Research integrity issues
- New instructional directions (K12, OER, academic SEO…)

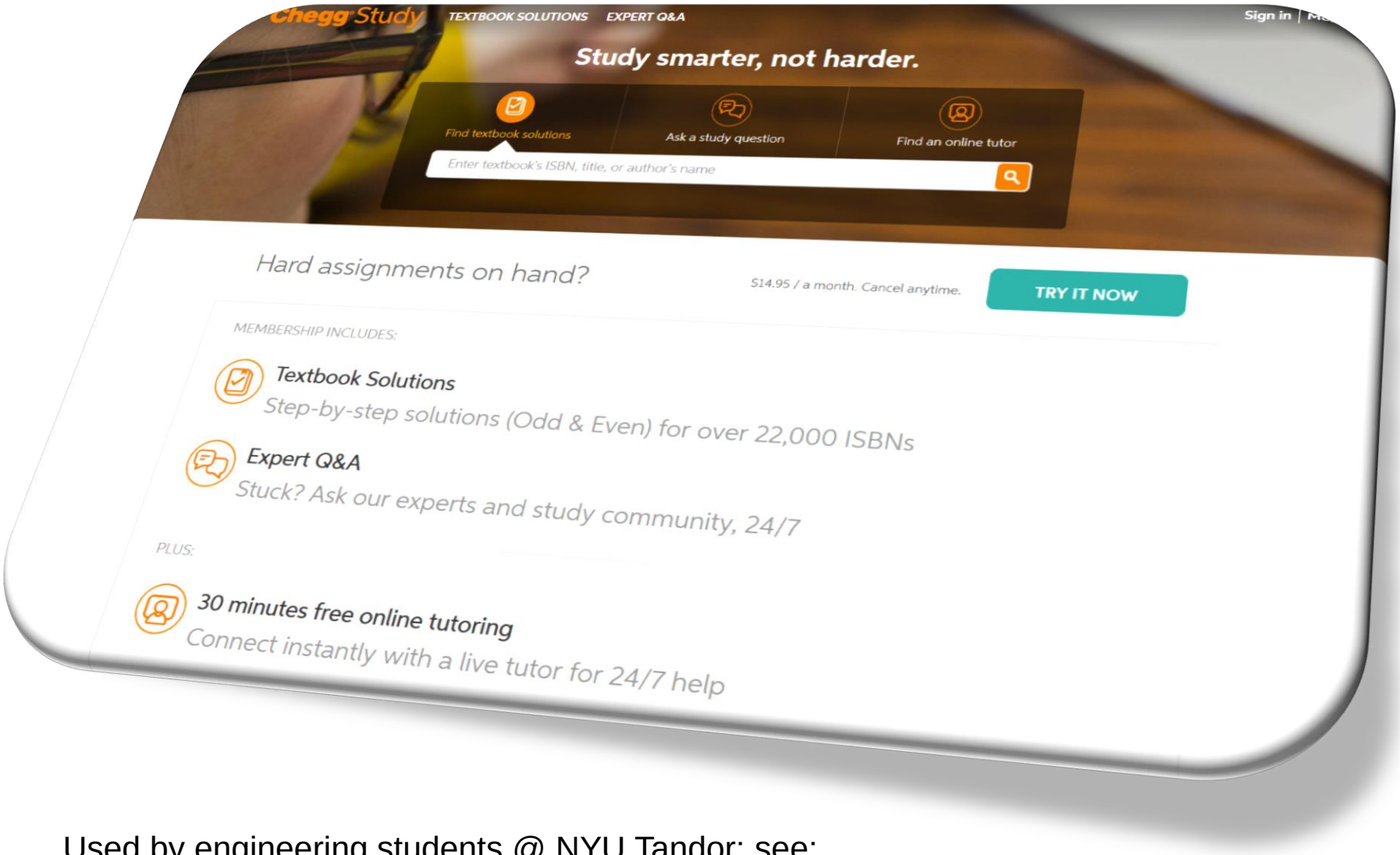
JOIN, or DIE.



Sample, collaborative effort
http://headt.eu/

IL standards: different lingo, better approaches necessary

- Student-centered language, concepts
- Crucial to map to real-world activities, because of commercial competition; e.g.:
  - **Thesis help**
    - Instead of “our” wording (e.g., *“define and articulates the need for information”* [IL STEM Standard 1])
  - **Literature review**
    - Examples in practice
  - **Trusted academic sources**
    - Not necessarily library-supported resources anymore!
    - IL STEM Standards 4, 5



Used by engineering students @ NYU Tandor; see:
https://insidescienceresources.wordpress.com/2017/02/15/apps-what-are-engineering-students-using/

[Google]. (4.3.2010). *How Search Works*. [Video File]. Retrieved from: https://www.youtube.com/watch?v=BNHR6IQJGZs

Assessment

International result:

Beneš, M., Zeman, J. (2012). Some Properties of Strong Solutions to Nonlinear Heat and Moisture Transport in Multi-layer Porous Structures. *Nonlinear Analysis: Real World Applications*. *13*(4), 1562-1580. https://doi.org/10.1016/j.nonrwa.2011.11.015

200.0 RIV points

Excellent (Pillar II, Grade A) result:

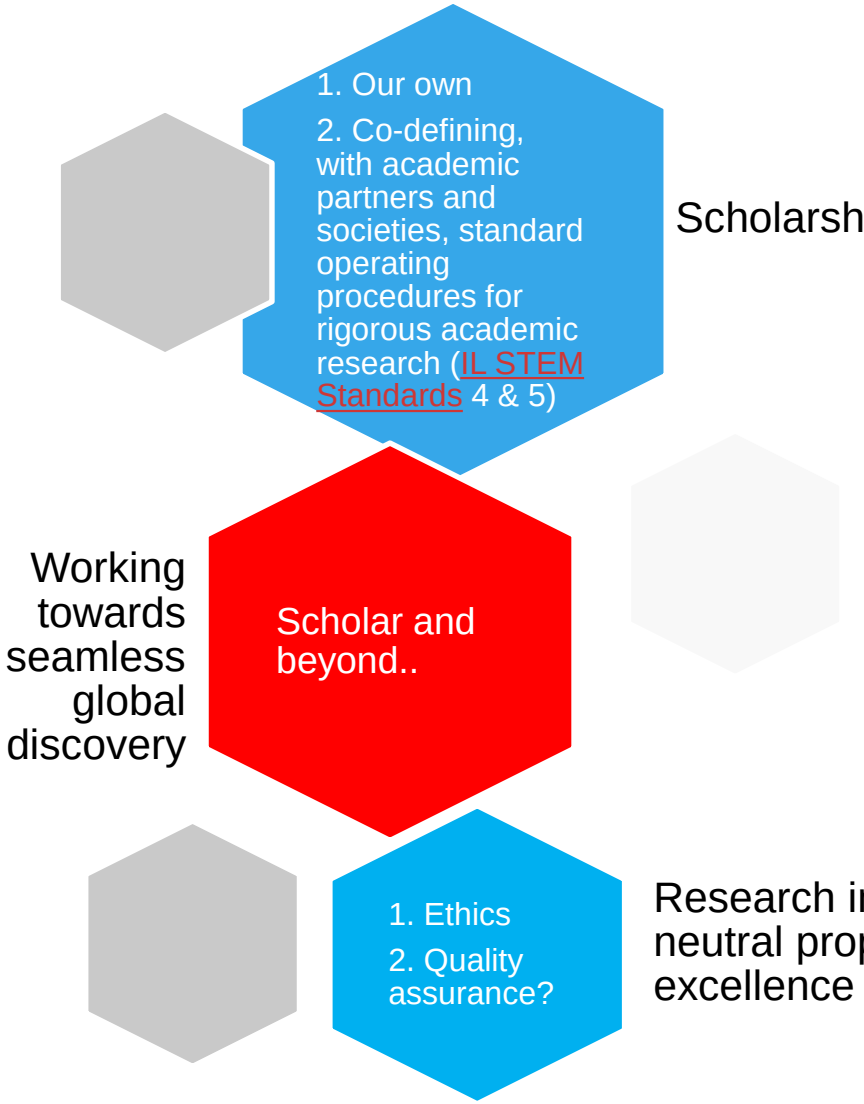
Zeman, J., Vondřejc, J., Novák, J., Marek, I. (2010). Accelerating a FFT-based solver for numerical homogenization of periodic media by conjugate gradients. *Journal of Computational Physics. 229*(21), 8065-8071. https://doi.org/10.1016/j.jcp.2010.07.010

126.5 RIV points (+ ~200 excellence points)

Assessment

- Mapping to Standards and Guidelines for Quality Assurance in the European Higher Education Area, Engineer of 2020, other
  - For EHEA:
    - 1.3 (Student-Centered Learning, Teaching and Assessment)
    - 1.5 (Teaching Staff – teaching competencies, including doctoral students and early career researchers)
    - 1.6 (Learning Resources and Student Support)
- Local hurdle: interested administrators

New horizons, if we wanted…



New horizons, if we wanted…

- Promoting trust; “seals of approval”
- How do we from the library community contribute to trust-building, on a global scale?
  - Trusted, “authentic” copies
  - Trusted journals
    - Truly global in scope
    - Independent of platform

Contact Information

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