E-learning in Clinical Biochemistry

Can it be effective?

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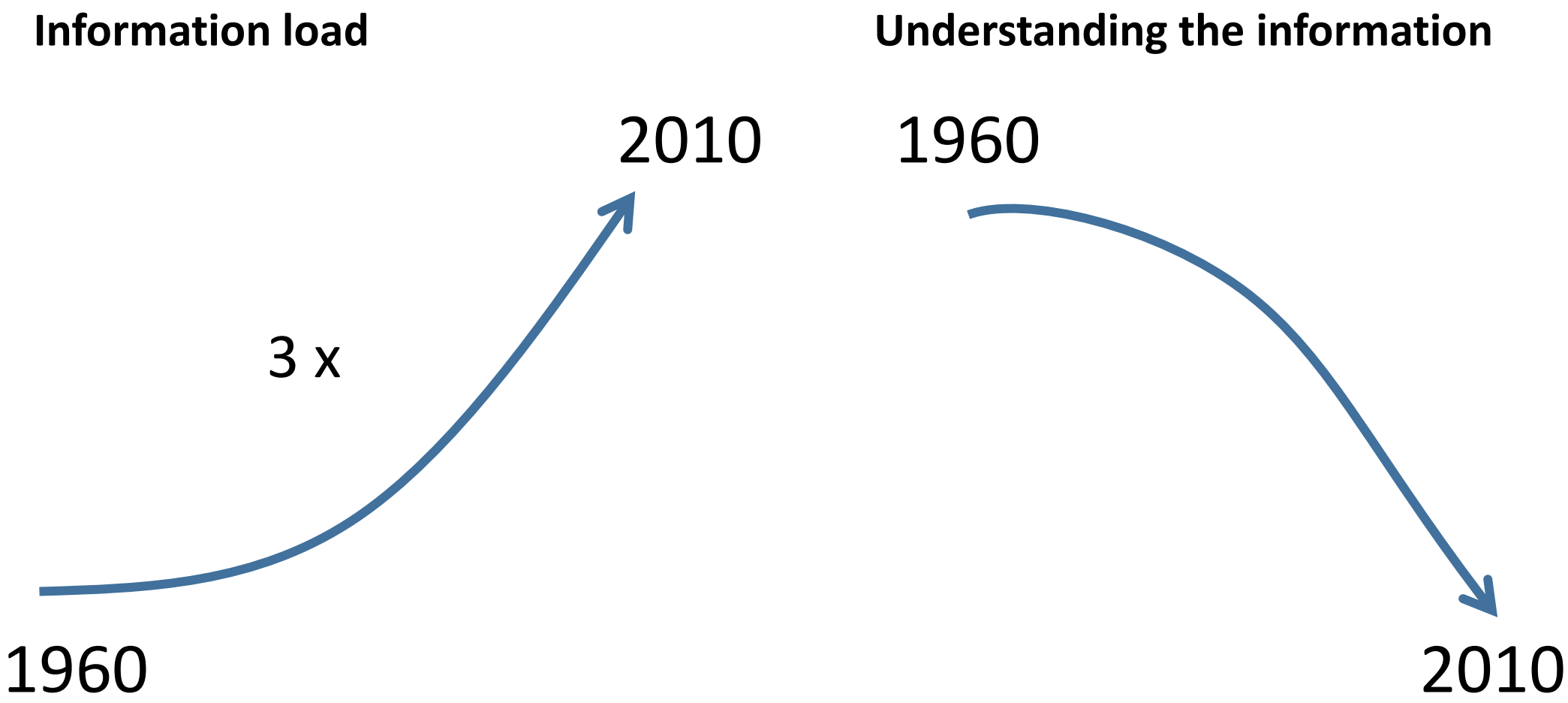
Propagace přírodovědných oborů prostřednictvím badatelsky orientované výuky a popularizace výzkumu a vývoje, reg. č. CZ.1.07/2.3.00/45.0028

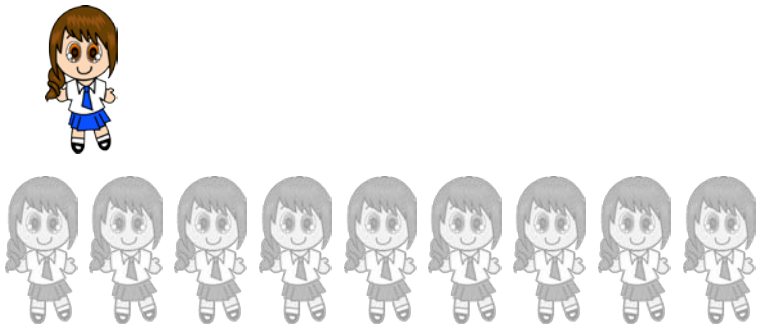
Summary

- E-learning can be an effective supplement of laboratory medicine education system
  - e-learning cannot be successfully implemented without changes in „traditional“ system
- When used appropriately, e-learning can:
  - intensify learning
  - improve getting feedback from students
  - generate objective data about effectivity of learning process
- Our examples
  - E-biochemistry (https://moodle.mefanet.cz)
  - Webinars (e-seminars)
  - „Healthy kitchen“ concept

The more information we receive, the …



Evolution of a teacher, students and teaching strategy

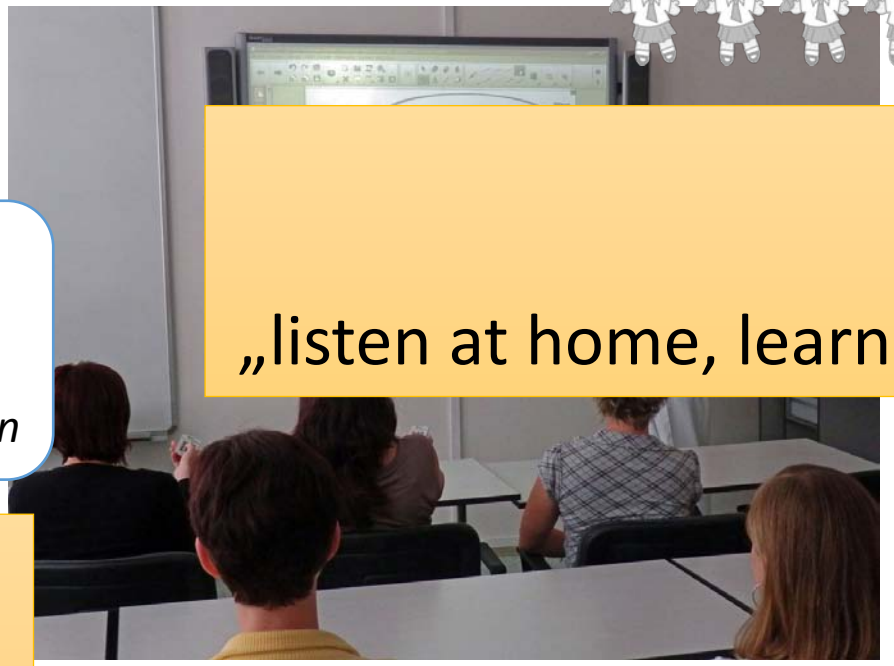


„College is a place where a professor's lecture notes go straight to the students' lecture notes, without passing through the brains of either."

Mark Twain

Goal = give information

„listen at school, learn at home"



Goal = understand

„listen at home, learn wherever you want"

Evolution of learning context

Lecture

Discussion

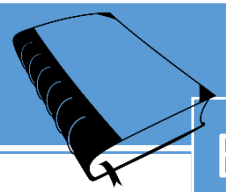
Informal learning

Information can be consumed

everywhere

Evolution of study material

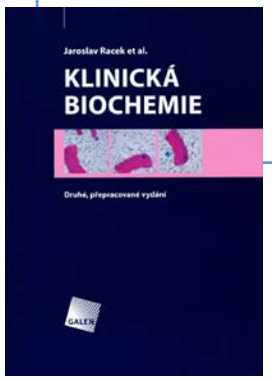
Printed Book



Text

Pictures

No devices, no internet



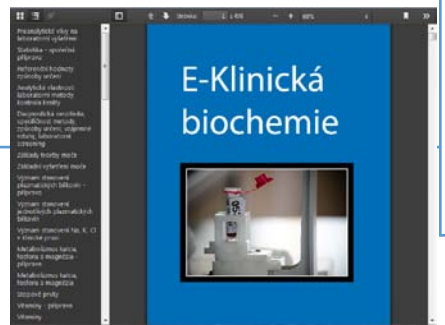
Electronic version of printed book

Text

Pictures

(Multimedia)

PC, no internet



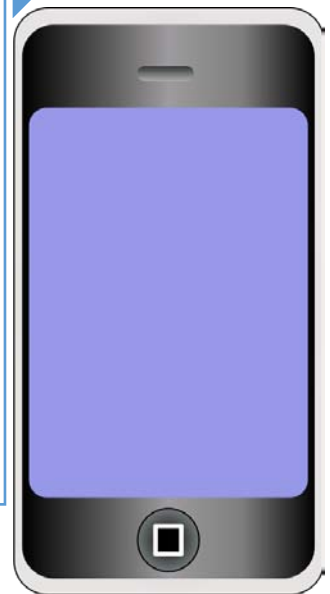
E-book, e-course, app

Text

Pictures

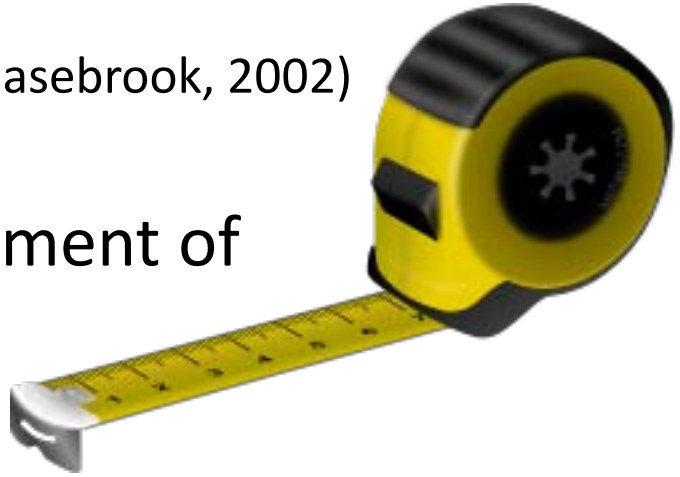
Multimedia, interactivity

Tablet, smartphones, e-readers, internet

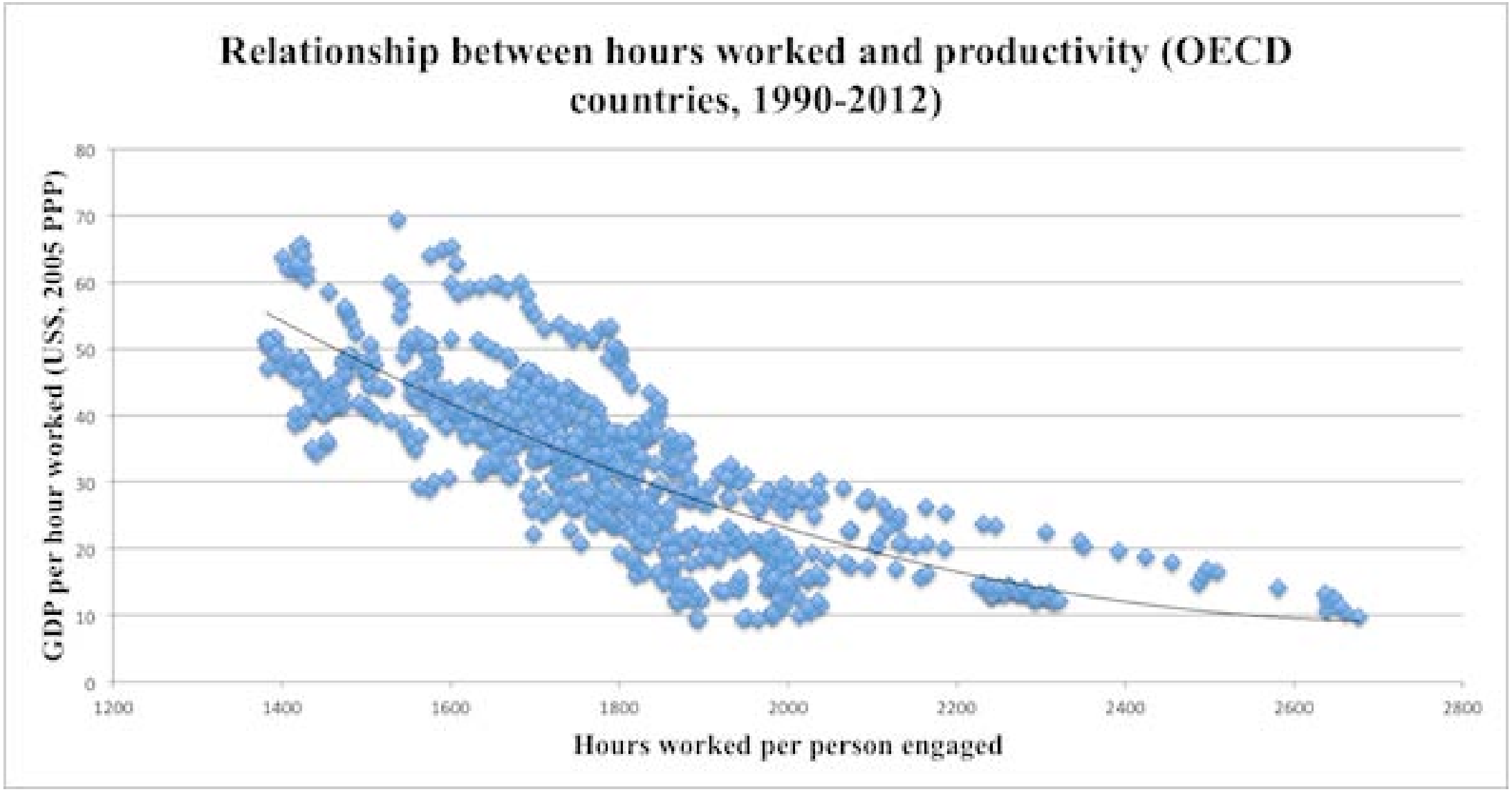


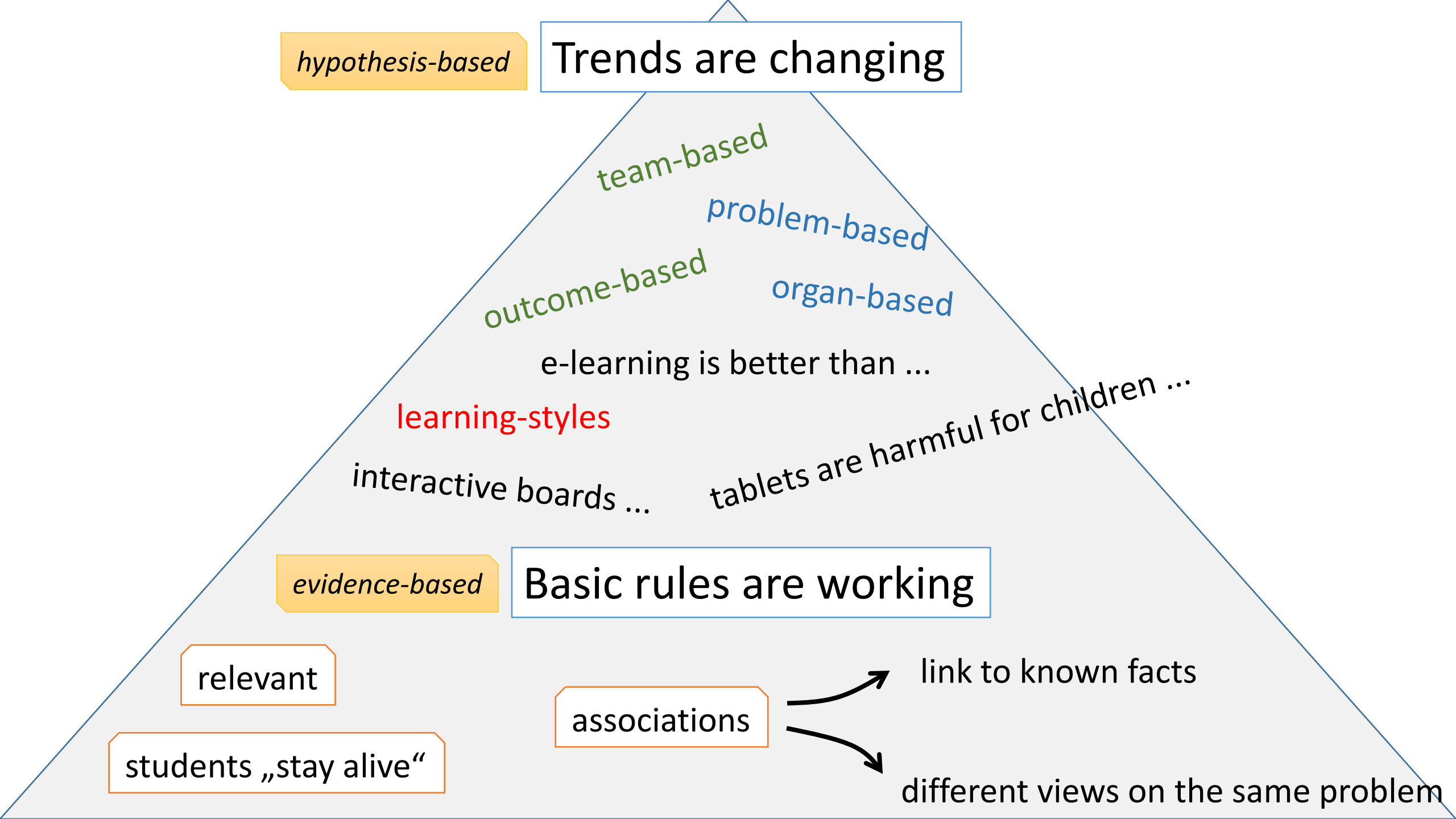
Effective teaching

- Effectivity of education proces is **not measured** routinely
- Studies (evidence-based teaching)
  - **e-learning** is better than nothing -> comparable with „traditional“ methods (Feng 2013)
  - More effective
    - the same can be leatned by e-learning in shorter (70 %) time. (Hasebrook, 2002)
    - 11% more effective. (Sitzmann, Ely, and Wisher, 2008)
- **E-learning** is a good way for quantification, measurement of education
- Learn how to teach (e-learning)



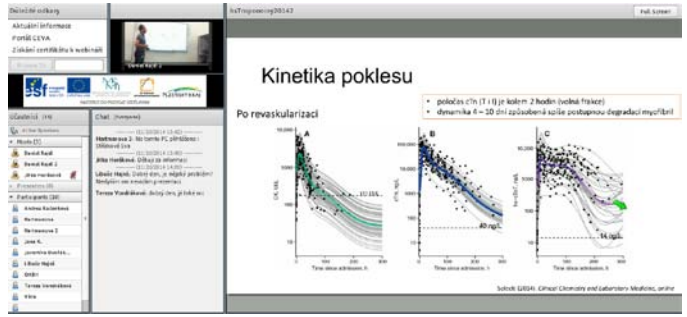
E-learning needs space and **time**




hypothesis-based
Trends are changing
team-based
problem-based
outcome-based
organ-based
e-learning is better than ...
learning-styles
interactive boards ...
tablets are harmful for children ...
evidence-based
Basic rules are working
relevant
students „stay alive“
associations
link to known facts
different views on the same problem

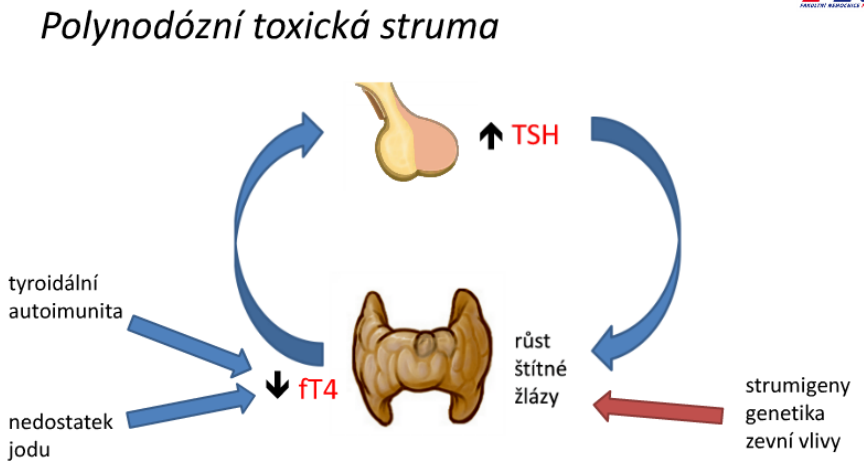
Our examples

- E-course E-biochemistry
  - Texts, voice-over presentations, interactive quizzes as tools for intensification of face to face education
- Webinars (E-seminars)
  - continuous professional development
  - EFLM WG DE e-seminars
- Healthy kitchen concept+ e-learning
  - „hands on“ teaching + support with associations, examples, basic knowledge by e-learningem



3 simple things …

Text



Presentation, video

U zdravého, přibližně 30 letého člověka je glomerulární filtrace přibližně (zaokrouhlete na celé - bez desetinných míst) .
Chceme-li odhadnout glomerulární filtraci, v klinické praxi máme obvykle 3 základní možnosti:

1. výpočet (např. CKD-EPI)
   - frakční exkrece inulínu
   - mikroalbuminurie
2. clearance endogenního kreatinu
   - clearance endogenního inulínu
   - clearance endogenního kreatininu
3. cystatin C v moči
   - cystatin C v séru
   - cystatin C v séru a v moči

ad 1. Pro tento způsob odhadu musíme mít změřenou koncentraci v , která kromě glomerulární filtrace závisí také na . Ženské pohlaví tento odhad - rasa (afričtí černoši) tento odhad .
ad 2. Pro tento způsob odhadu musíme mít změřenou koncentraci v . Nejčastějším a nejvýznamnějším zdrojem chyb u tohoto odhadu je .
ad 3. Principem tohoto odhadu je , filtrace glomerulem a resorpce a degradace v proximálním tubulu. Pokles glomerulární filtrace vede k vzestupu v .

Quiz

2

E-course E-biochemistry + seminars

- Preparation for seminars
- Homework
- Feedback (quizzes, evaluation)

Pacient přivezen v bezvědomí, TK 140/90 to

B_	pH krve	7,0	
B_	BE	- 22	mmol/l
S_	Na	140	mmol/l
S_	K	6,5	mmol/l
S_	Cl	105	mmol/l
S_	urea	15	mmol/l
S_	kreatinin	135	µmol/l
S_	glukóza	8,5	mmol/l
S_	osmolalita	340	mmol/kg

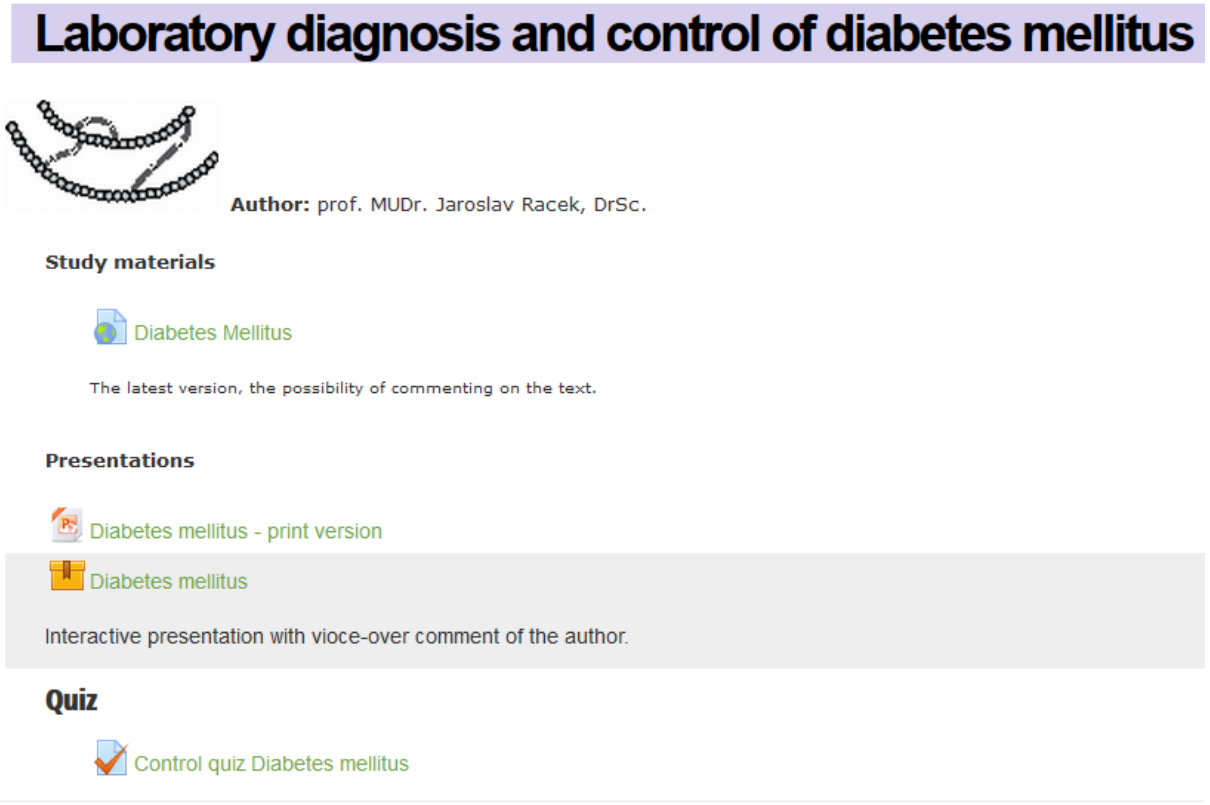
budete myslet na:

Vyberte jednu z nabízených možností:

- a. šokový stav s laktátovou acidózou
- b. otravu salicyláty
- c. diabetické kóma
- d. otravu metanolem nebo etylénglykolem
- e. těžké selhání ledvin

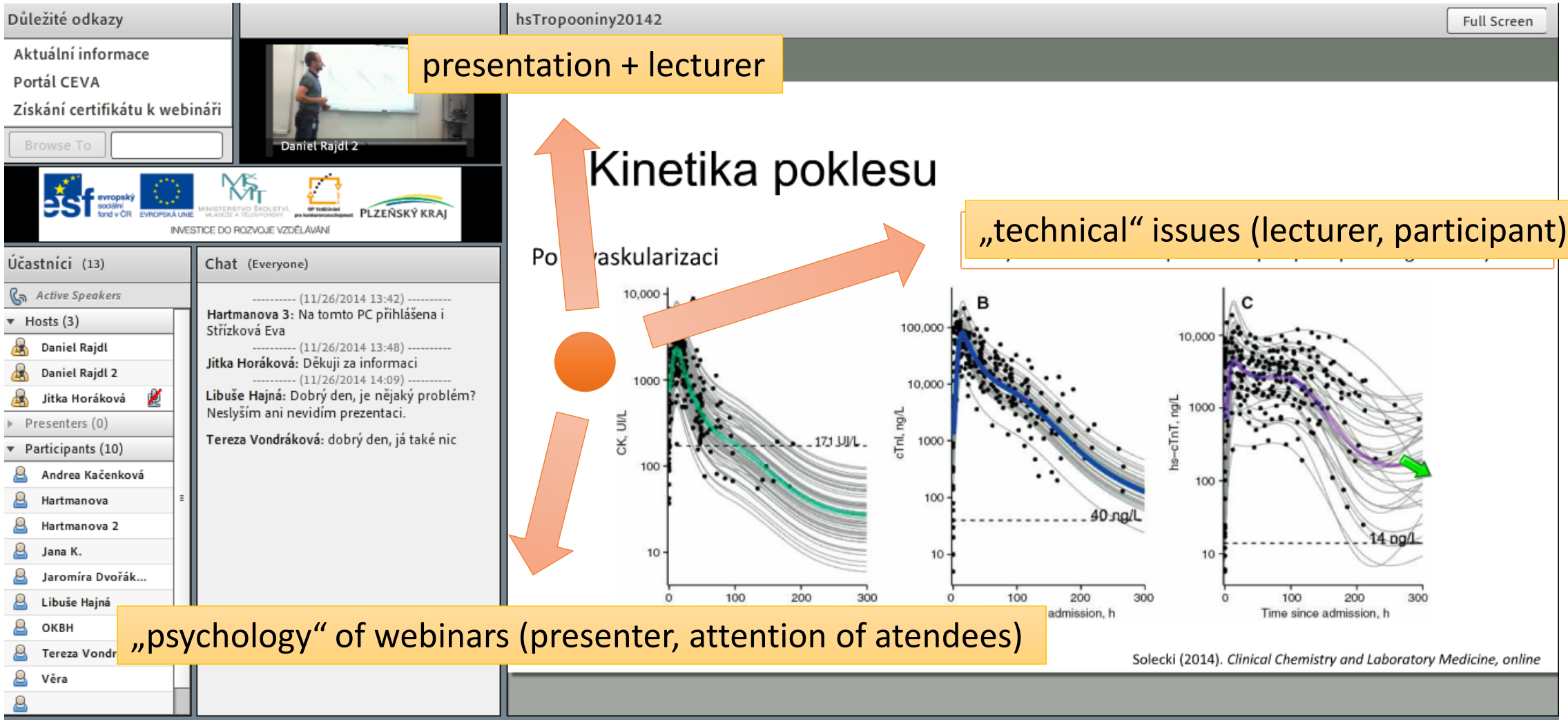
E-biochemistry course, English version

- Texts and quizzes = complete
- Presentations with voice-over comment = not complete



share? cooperate?

Webinars (e-seminars)



EFLM WG-DE

Do you need webinar, streaming of an event?

„No problem“ ☺

Chair

Dragana Šegulja
first term 2014-2015

Dept. of Laboratory Diagnostics
University Hospital Centre Zagreb
Zagreb - Croatia

Members

Member **Daniel Rajdl** first term: 2015-2016	Inst. of Clinical Biochemistry and Hematology Charles University Pilsen, Czech Republic
Member **Henrique Reguengo** first term: 2015-2016	Clinical Chemistry Service Centro Hospitalar Porto, Portugal
Corresponding Member **Graham Lee** first term: 2015-2016	Dept. Clinical Chemistry & Diagnostic Endocrinology Mater Misericordiae University Hospital Dublin, Ireland
Corresponding Member **Anna Merino** first term: 2015-2016	Dept. of Public Health University of Barcelona Barcelona, Spain

EFLM WG-DE e-seminars

- 2014-11-04 - Speaker: *Dr. Kristin Moberg Aakre (NO)*
  How can biological variation data for high sensitive troponins be related to current recommendations for diagnosing acute myocardial infarction
- 2014-12-09 - Speaker: *Prof. Elvar Theodorsson (SW)*
  Bias in Clinical Chemistry
- 2015-01-28 - Speaker: *Dr. Gilbert Wieringa (UK)*
  EU Directive 2013/55/EU on the Recognition of Professional Qualifications
- 2015-02-24 - Speaker: *Prof. Michel Langlois (BE)*
  Comprehensive **dyslipidemia** testing beyond the “good” and “bad” cholesterol
- 2015-03-18 – Speaker: prof. Mario Plebani (IT)
  Harmonisation in Laboratory Medicine

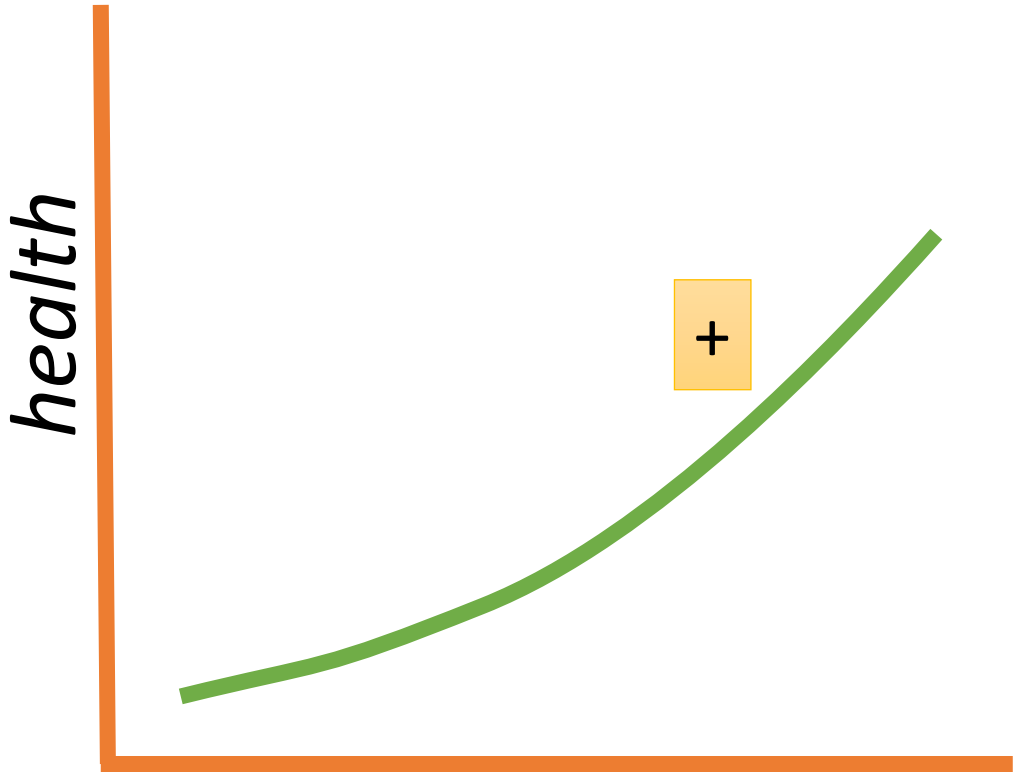
YouTube

Healthy kitchen concept

- nutrition is systematically taught at 2% medical faculties (worldwide)
- elderly = chronic non-infectious diseases (diabetes, cancer, cardiovascular)
  - prevention (learn, how to be healthy = salutogenesis)
  - laboratory medicine is close to prevention (dyslipidemias …)
  - pregradual and CPD

Cooking and health

culinary



science

time spent by preparation (and consummation) of meals

- better nutrition
- better advices to patients

Cooking + nutrition + critical thinking

On-line streaming (webinars)

Prepared courses, homework (recipes, knowledge)

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