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How does technology impact on the teaching and learning process – positive and negative effects

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technology impact ?

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computer, mobile phone, Laptop, i-pad, smart phone, ...
eLearning, mobile learning, second life, game based learning, interactive classroom, wikipedia, chat rooms, blogs, facebook, twitter,
net-generation...

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- Do we need all this ???
- Have students changed ?
- Has the teachers role changed ?
- **Do WE have to change ?**

"real life" example:

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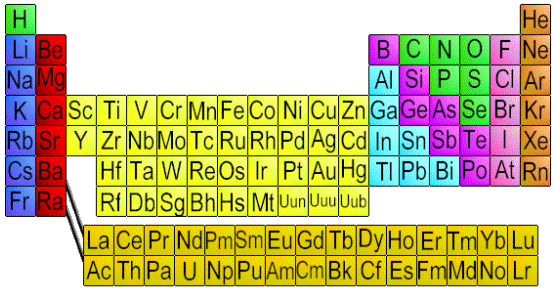
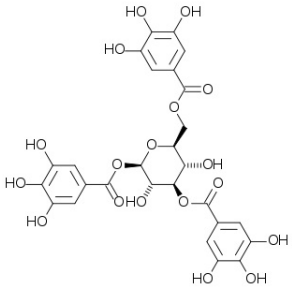
20 years "General Chemistry" lecture for students in the 1st semester:



constant:
basic Chemistry
lecture hall
age of the students
available hours (14 x 3 hours: 8 am – 10 am)
exams (written)



changes on teachers side:
age of the teacher
overhead + black board ->
power point + black board + script ->
ppt + black board + script + video recording
increasing number of daily life examples

changes on students side:
number of students (150 -> 450)
more demanding ?
decrease or change of previous knowledge?
changes in attitudes
increasing use of e-learning and chats

student: personal learning environment

HARDWARE 1992 -> 2012

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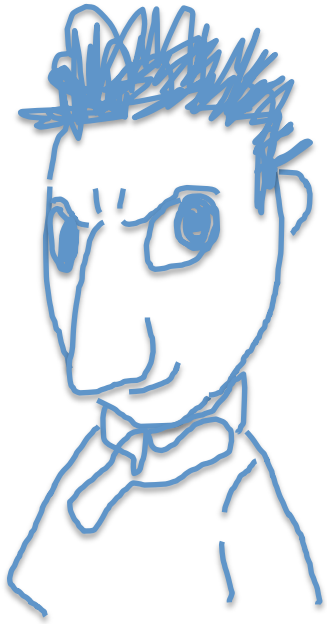
books
webcam
PC
mobile phone
docking station
copier
smart phone
LapTop
headset
GPS
black board
pencil
digital pen
chip card
white board
calculator
USB-stics
digital cam
script
paper-notebook
internet modem
beamer
card-reader unit
external hard disk drive
printer
laboratory equipment
scanner



why not use the additional possibilities?

student: personal learning environment

COMMUNICATION 1992 -> 2012

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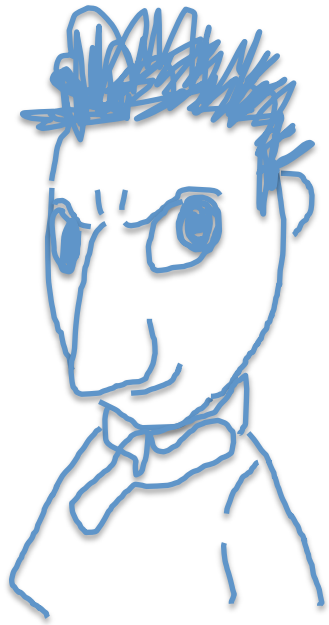
virtual meetings

personal meetings



lectures

social networks

Internet-forums

SMS

letter

E-mail

consultation hours

telephone

chat-rooms

mobile phone

why not use the additional possibilities?

trend in use of e-media at BOKU

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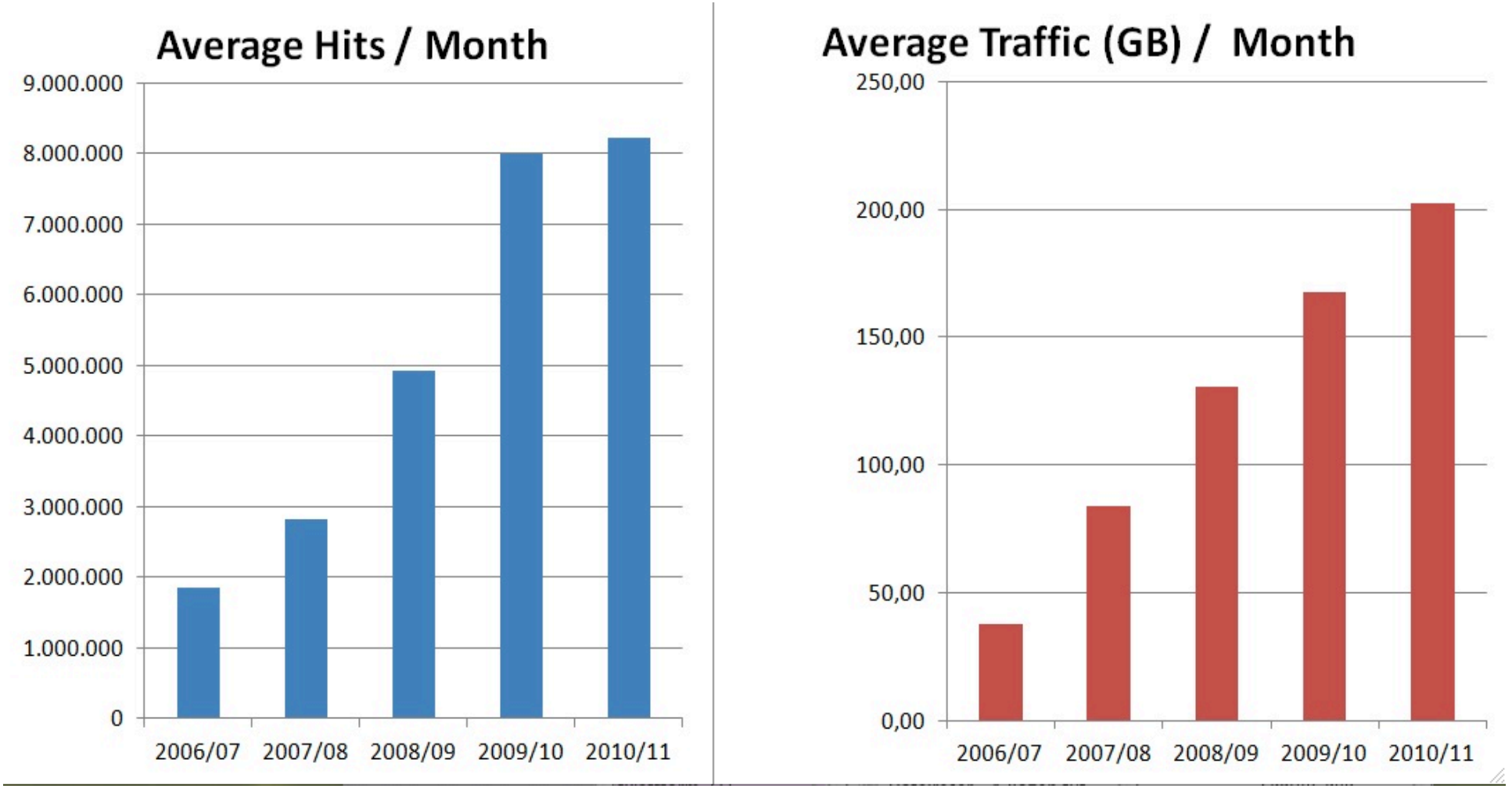
average hits and average data communication e-learning at BOKU



trend in use of e-media at BOKU

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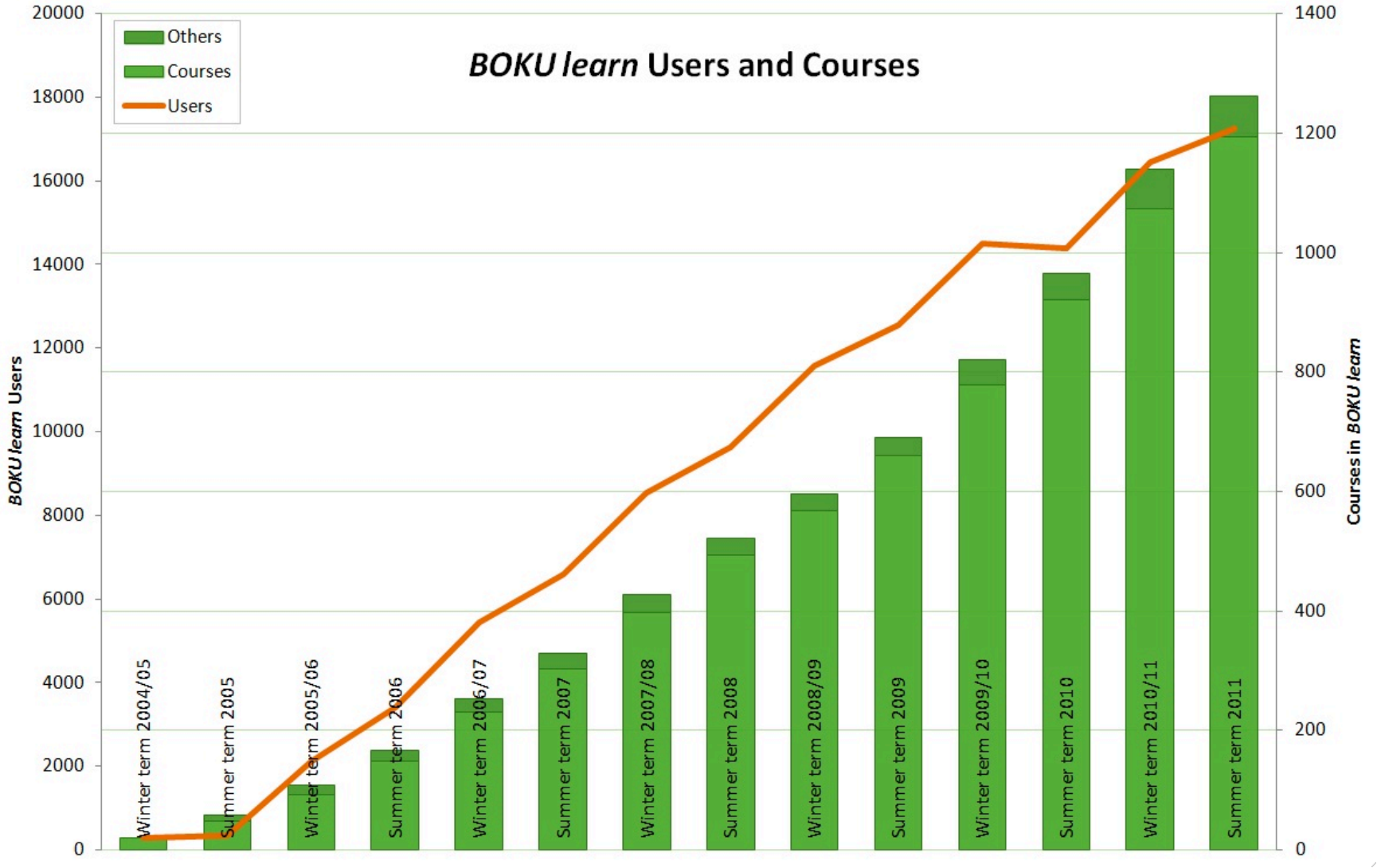

back to

"real life" example: General Chemistry lecture

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starting point:

- about 450 students
- big lecture hall => interactive lecture is a big challenge
- huge package of chemistry to offer to the students
- very differents previous knowledge

ideal case:

Essentials of a lecture

- Give information
- Generate interest
- Facilitate learning

Adapt to students' frames of reference
Be committed and engaged - eye contact
Give skeletal outline & signposts
Structure the topic & explain
Exemplify & emphasise key points
Illustrate (use audio-visual aids)
Link to reality & practice
Summarize
Involve students!!

"Giving a good lecture is an intellectual and emotional challenge that should be worth real effort."

source: Birgitta Malmfors 2006

"real life" example: General Chemistry lecture

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How to improve the situation for the students in this case?

=> new technologies

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Video-Recording of lectures:

teacher needs

- camera
- laptop (with touch screen + digital pen)
- microphone
- software

student needs

- laptop or PC
- internet connection
- software

Video-Recording of lectures:

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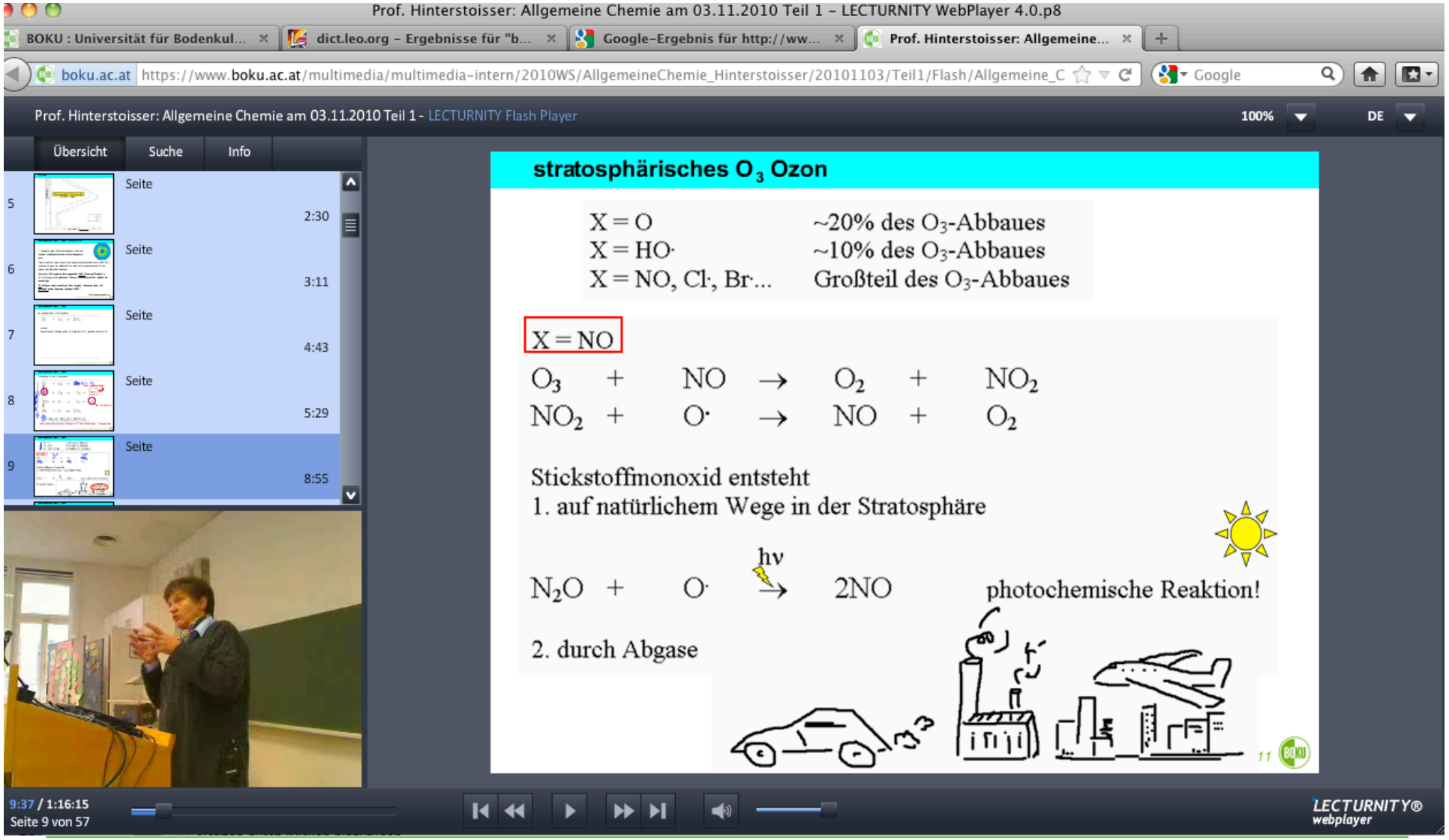

Video-Recording of lectures:

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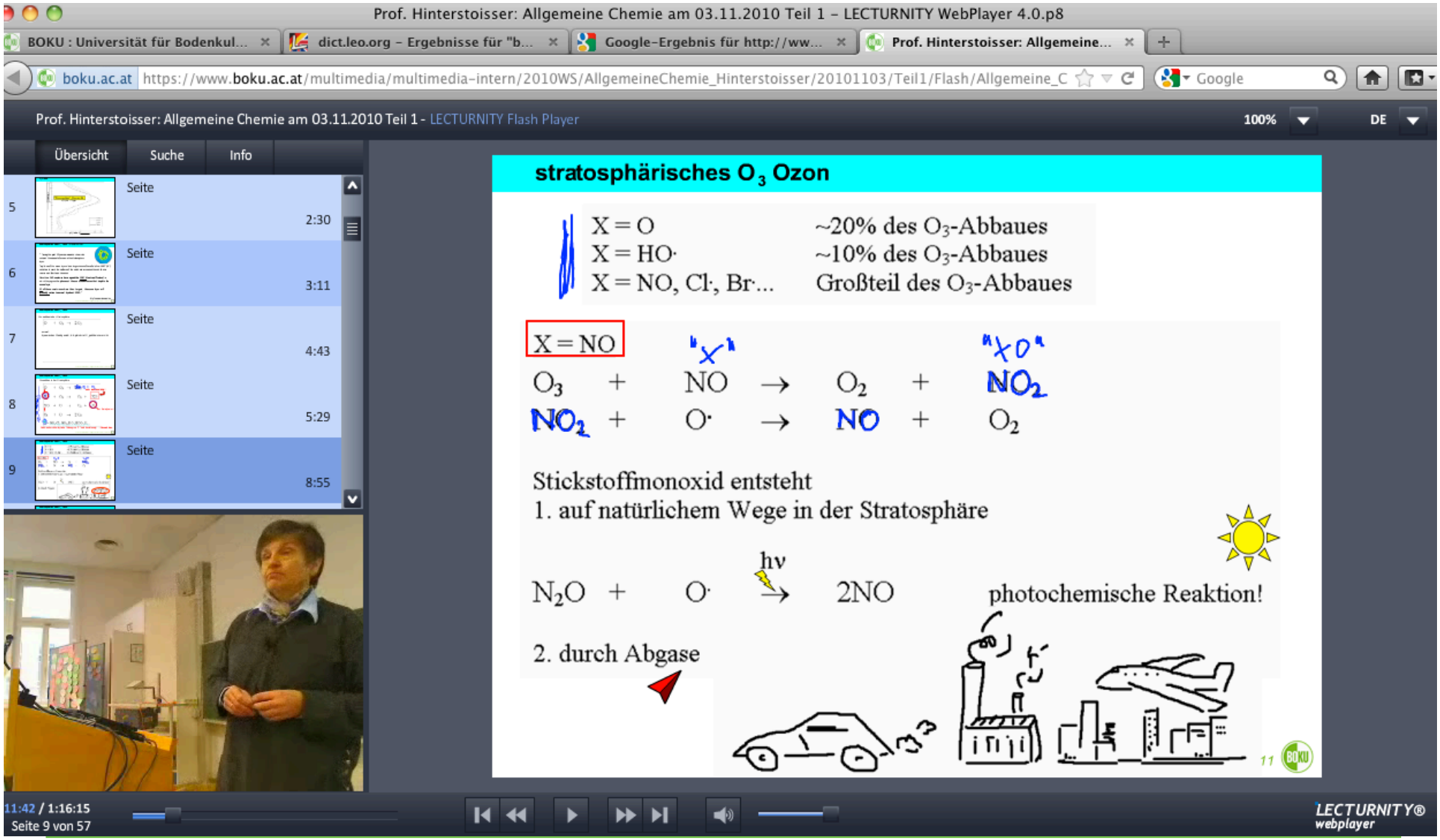

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Video-Recording of lectures:

advantages:

- students focus by listening making less notes during the lecture
- recapitulation is possible at any time anywhere
- searching for key-words possible => easy to find the specific sequence
- missed lectures can be catched up later
- "O-tone" of the teacher + gesture of teacher
- life drawing (touch screen) underlines the spoken word, is used for explanations, notations...
- two media (eg. ppt + black board) can be involved
- interactive lecture still possible
- the recorded lecture is an "add on" as learning tool
- post-editing is possible !

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Video-Recording of lectures:

drawbacks:

- ✧ hardware + software
- ✧ copyright
- ✧ students need a Laptop or PC and internet access
- ✧ students might skip the lectures more often
- ✧ teachers mobility in the classroom is restricted
- ✧ teachers have to think more about their wording (self-control...)
- ✧ new content means new recording !
- ✧ support of teachers often necessary
- ✧ start is more time consuming
- ✧ it is still a "ex-cathedra teaching" !

Video-Recording of lectures at BOKU:

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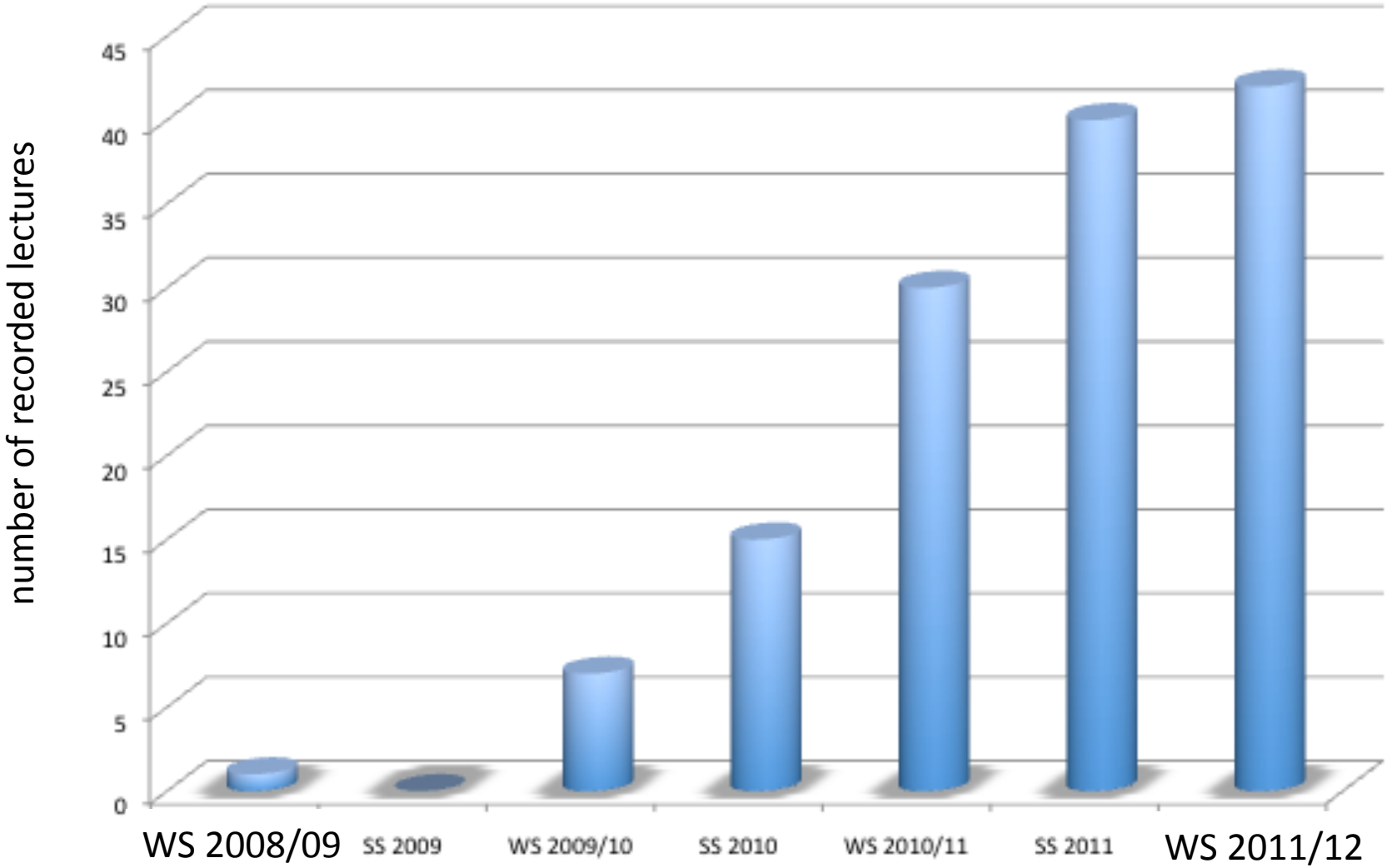

Video-Recording of lectures:

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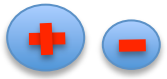
"side effects":

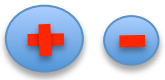
technology might speed up teaching

danger of information overload => quantity versus quality

teachers start self-control (gesture, wording,...)



colleagues might look at your lecture



students are easier familiar with the new system

"teacher taught by students"!!!!

=> changes the teacher – student relation

General aspects - resumé

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- the didactic playground has broadened:
  - teachers and students can find THEIR personal way !
- the teaching/learning tool kit became bigger
  - students are (mostly) used to to the tools
  - teachers are not always used to the tools
- teaching and learning could (again) become interactive
  - e-mailing, e-learning communication are standard already
  - teaching by that might consume more time as before "e-tech"

BUT: The digital divide increases and becomes a serious problem!


Thank You for Your attention!