

Perspektiven der Hochschulbildung im digitalen Zeitalter

Tag der Lehre Hochschule Fresenius, Idstein,
28. Juni 2019

Prof. Dr. Marco Kalz, Professor für Mediendidaktik
Pädagogische Hochschule Heidelberg



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Dr. 10/2009

PhD Educational Technology
Open University of the Netherlands, Heerlen, The Netherlands

MA 04/2003

Master of Multimedia Didactics
University of Nuremberg-Erlangen, Nuremberg, Germany

MA 11/2000

First State Examination for Teachers
University of Cologne, Cologne, Germany

present Full professor of technology-enhanced learning
04/2018 Heidelberg University of Education, Heidelberg, Germany

03/2018 Full professor and UNESCO chair of Open Education
04/2015 The Open University of the Netherlands, Heerlen, The Netherlands

03/2015 Associate Professor
05/2013 Open University of the Netherlands, Heerlen, The Netherlands

04/2013 Post-Doc/Assistant Professor
10/2009 Open University of the Netherlands, Heerlen, The Netherlands

09/2009 PhD researcher
02/2006 Open University of the Netherlands, Heerlen, The Netherlands

01/2006 Researcher
01/2004 Fernuniversität in Hagen, Hagen, Germany

12/2003 Researcher
07/2002 University of Duisburg, Duisburg, Germany

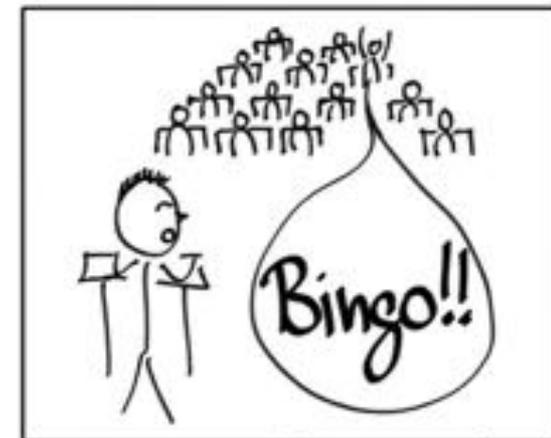
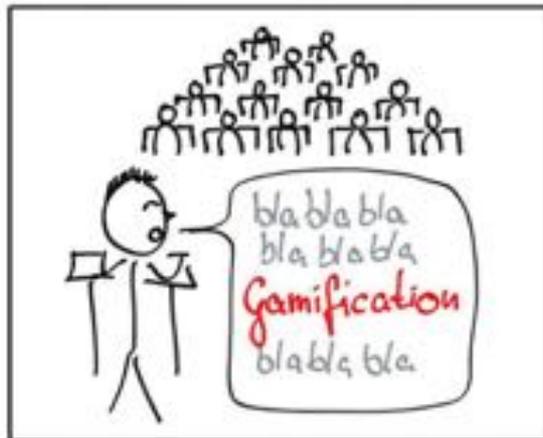
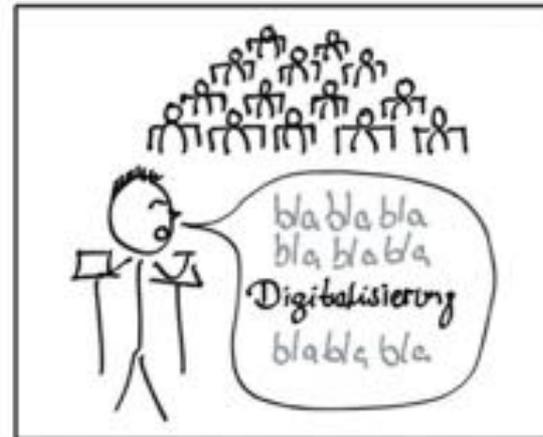
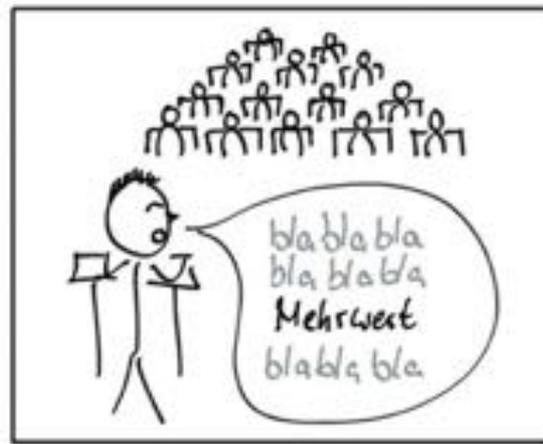


Master-Studiengang **E-Learning und Medienbildung**

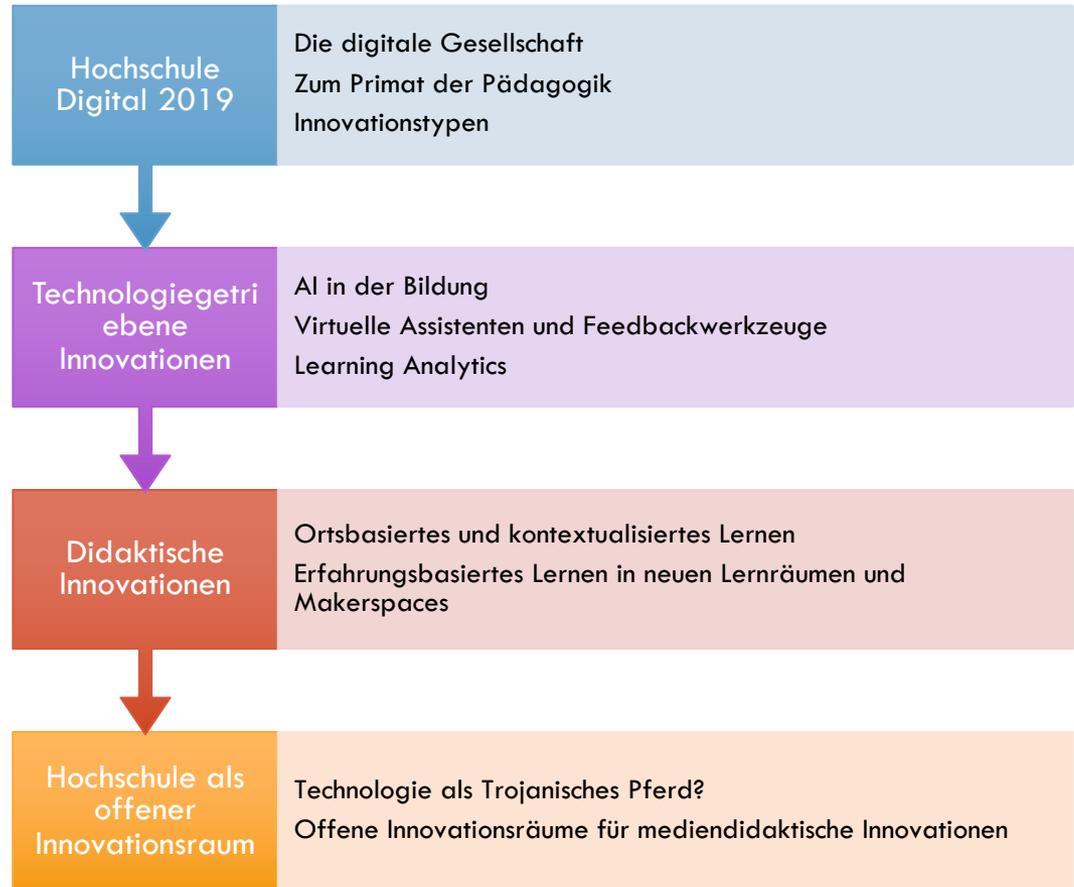
Abschluss: Master of Arts
Regelstudienzeit: 4 Semester (120 LP)
Beginn: Sommersemester

Informationen unter
www.ph-heidelberg.de/elmeb21





STRUKTUR DES VORTRAGS





DIE DIGITALE GESELLSCHAFT

„The term ‘digitised society’ refers to a society that is dependent on digital technologies, software, platforms, media and social and digital networks for interaction, connectedness, both at work and in people’s everyday lives. This implies a society characterised by an ongoing and increased digitisation and more advanced technologies.“

Fransson, 2016



Der Digitalrat



Der Digitalpakt Schule



Der DESI Index



Der DESI Index

	Deutschland		EU
	Rang	Wert	Wert
DESI 2019	12	54,4	52,5
DESI 2018	13	51,8	49,8
DESI 2017	11	49,4	46,9

KENNZEICHEN DER DIGITALEN GESELLSCHAFT



PÄDAGOGISCHER DETERMINISMUS

- Einseitiges Technologieverständnis
- Naives Verständnis von Pädagogik und Didaktik
- Ignoranz der Innovationsprozesse

*Pädagogik kommt
vor Technik*

Illustration von Katharina Bitzl. In: Süddeutsche Zeitung Nr. 52 vom 03./04.03.2018 via [Axel Krommer](#)



3 TYPEN VON INNOVATIONSPROZESSEN



4 MEDIENDIDAKTISCHE ZIELE



Lernerfolg
verbessern



Workload der
Lehrenden
vermindern



Feedback
ermöglichen

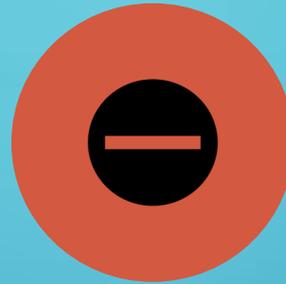


Wissen
transferieren

LERNERFOLG VERBESSERN



LERNEN ERFOLGT ÜBER
TECHNOLOGIE EFFEKTIVER
ODER EFFIZIENTER



ZUGANG ZU
LERNANGEBOTEN
ERMÖGLICHEN

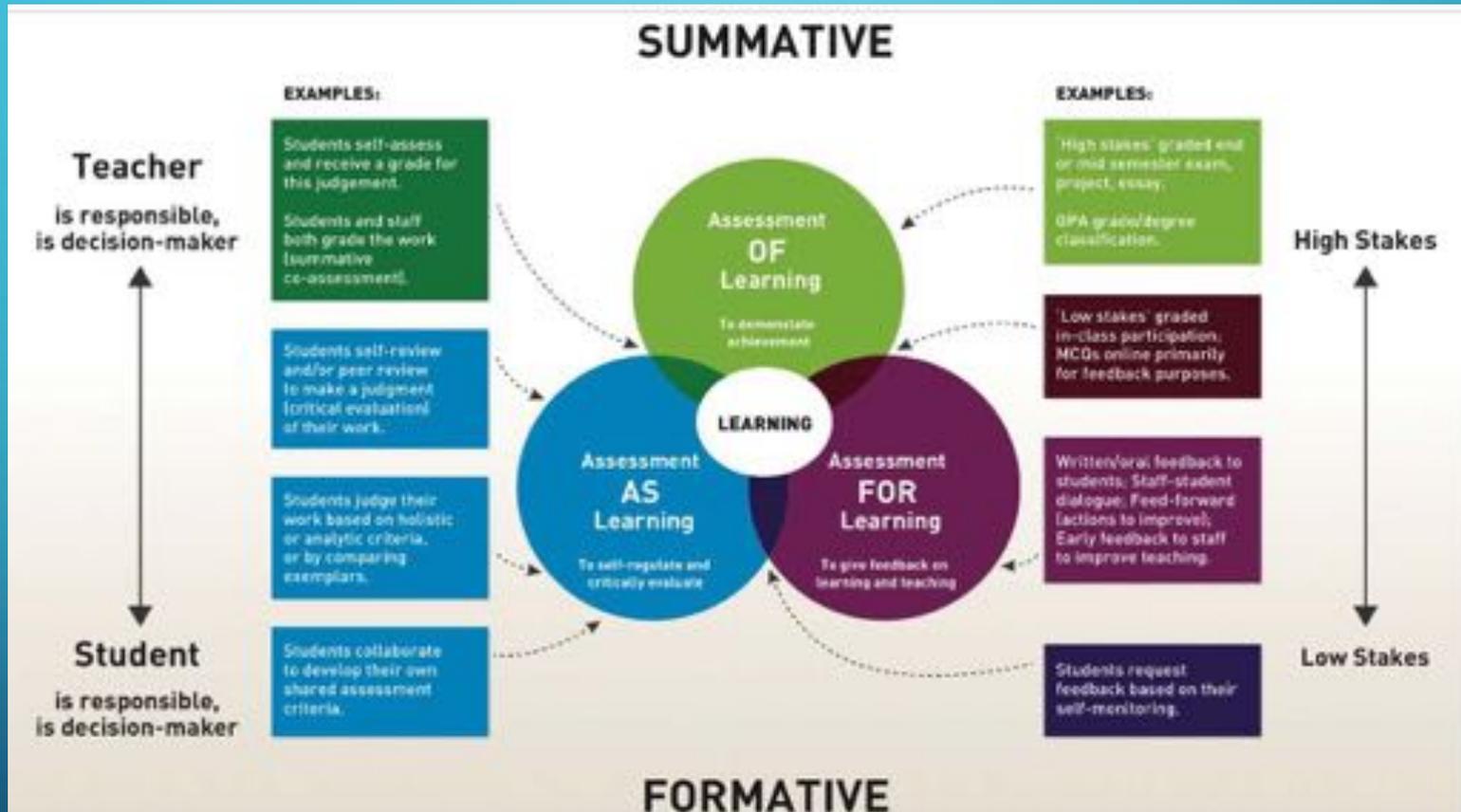


LERNER, DIE IN ANDEREN
SZENARIEN ABBRECHEN
WÜRDEN, BLEIBEN AM BALL

WORKLOAD VERMINDERN



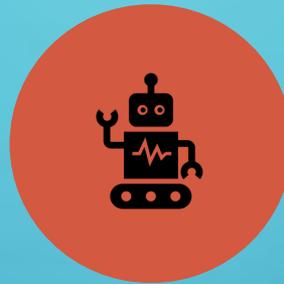
FEEDBACK ERMÖGLICHEN



WISSEN TRANSFERIEREN



TRENNUNG VON LERN-
UND
ANWENDUNGSKONTEXT



KÜNSTLICHE
LERNKONTEXTE



KEINE EINBETTUNG IN
KULTURELLE UND SOZIALE
UMGEBUNGEN

Innovating Pedagogy 2019

Exploring new forms of teaching, learning and assessment, to guide educators and policy makers

Rebecca Ferguson, Tim Coughlan, Kjetil Egelandstad, Mark Gaved, Christothea Herodotou, Garron Hillare, Derek Jones, Iestyn Jowers, Agnes Kukuška-Hulme, Patrick McAndrew, Kamila Molejká, Ingunn Johanna Ness, Bert Rierbes, Eileen Scanlon, Mike Sharples, Barbara Wasson, Martin Weller, Denisa Whitelock

Open University
Innovation Report 7

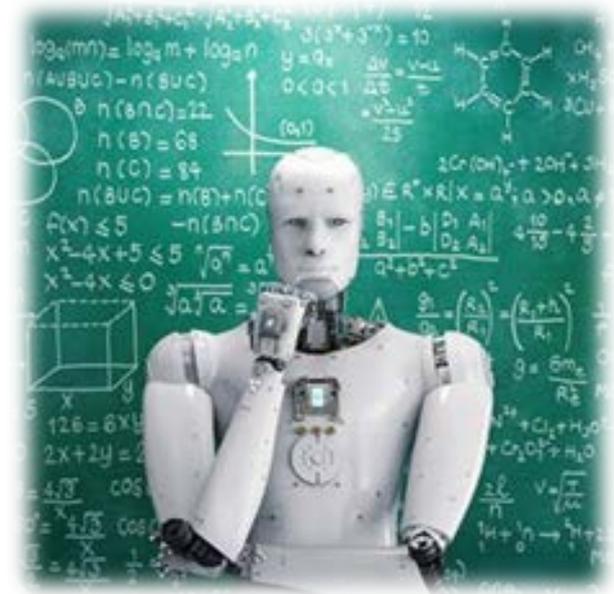


EDUCAUSE

EDUCAUSE Horizon Report | 2019 Higher Education Edition



TRENDS UND INNOVATIONEN DER BILDUNGSTECHNOLOGIE



KÜNSTLICHE INTELLIGENZ IN DER BILDUNG

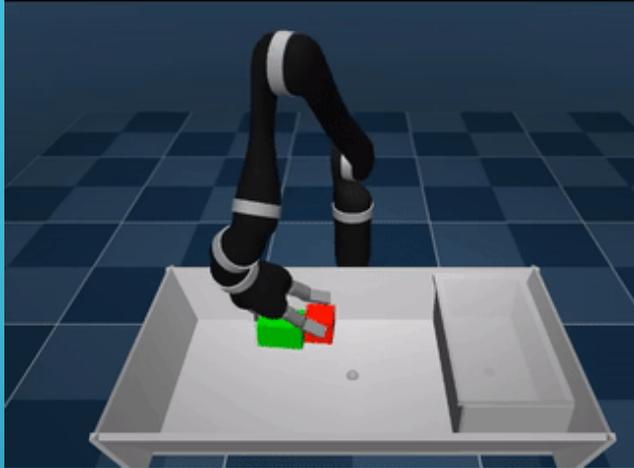
ALPHAGO

4 : 1



AlphaGo played a handful of highly inventive winning moves, several of which ...were so surprising they overturned hundreds of years of received wisdom, and have since been examined extensively by players of all levels. In the course of winning, AlphaGo somehow taught the world completely new knowledge about perhaps the most studied and contemplated game in history.

DEEPMIND



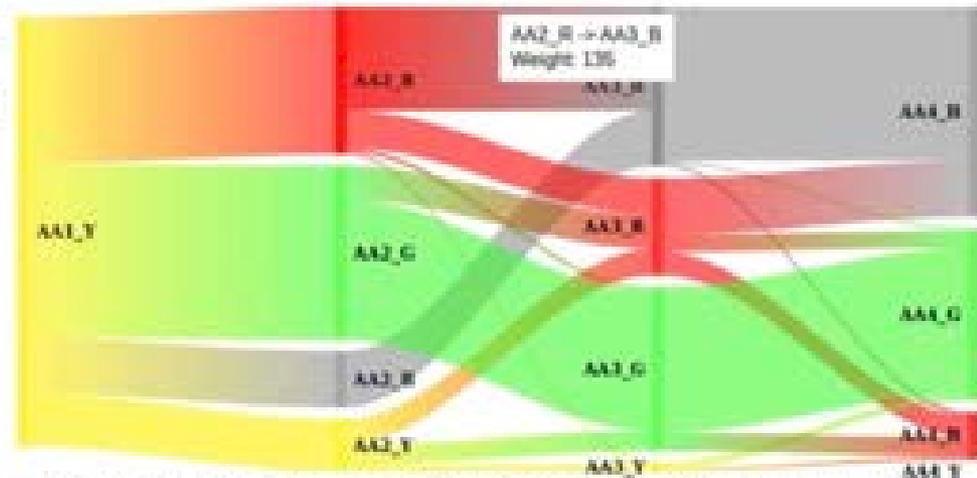
Just as a baby must develop coordination and balance before she crawls or walks—providing an agent with internal (auxiliary) goals corresponding to simple skills increases the chance it can understand and perform more complicated tasks. Our agent can then decide by itself about its current ‘intention’, i.e. which goal to pursue next.

VORHERSAGEMODELLE



Classroom Students						
Username	Student	Last access	AA1	AA2	AA3	AA4
			Pred. Grade	Pred. Grade	Pred. Grade	Pred. Grade
Fundamentos computadores aula 2						
...	...	2018-05-18 22:17:28	B A	B B	On A	On A
...	...	2018-04-03 10:14:23	B N	Z N	Z N	On N
...	...	2018-08-08 13:20:13	B B	B B	On D	On N
...	...	2018-06-03 20:44:14	B D	B D	B D	On N
...	...	2018-05-12 23:03:12	B On	B On	On On	On On

(a) Report of the warning level for activity



(b) Interactive Sankey diagram with the progression of the warning level for activities

VORHERSAGEMODELLE

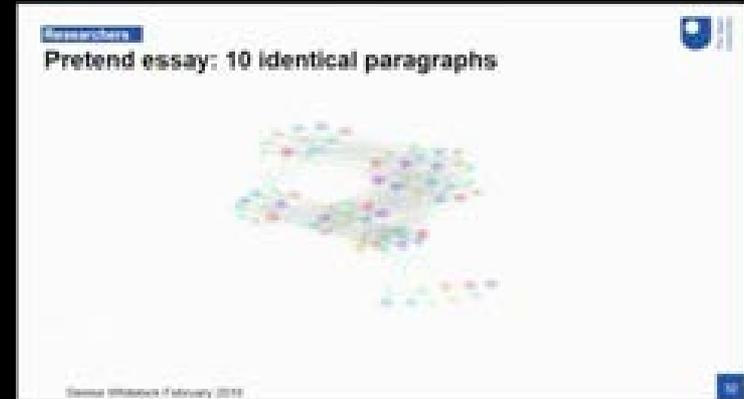
- Vorhersage der Drop-Out Chancen auf Basis von Daten aus Online-Systemen
- Gezielte Interventionen (auch analoge), um Lernern vom Abbruch abzubringen





VIRTUELLE ASSISTENTEN UND FEEDBACKWERKZEUGE

INTELLIGENTE SCHREIBUNTERSTÜTZUNG



Shum, S. B., Sándor, Á., Goldsmith, R., Bass, R., & McWilliams, M. (2017).

Whitlock, D., Twiner, A., Richardson, J. T., Field, D., & Pulman, S. (2017, October).

MANAGEMENT DES LERNPROZESSES

Tabuena, Kalz & Specht, 2014



a) Write a blog entry at coffee time when I arrive to work



b) Reading a pocket book in waiting times



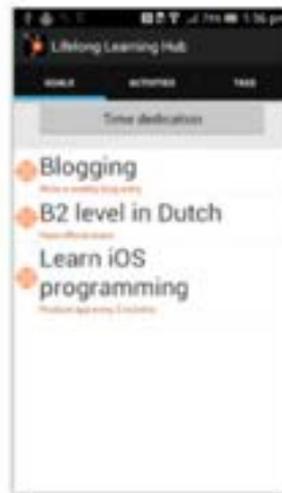
c) Listening foreign language podcasts in car transitions



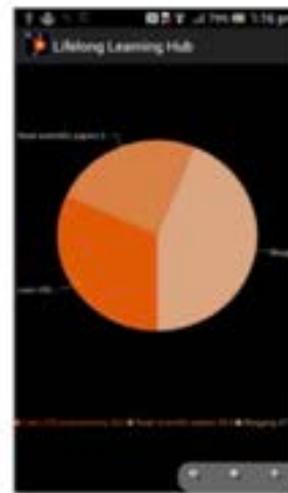
d) Watch MOOC videos in tablet on the coach in commercial breaks



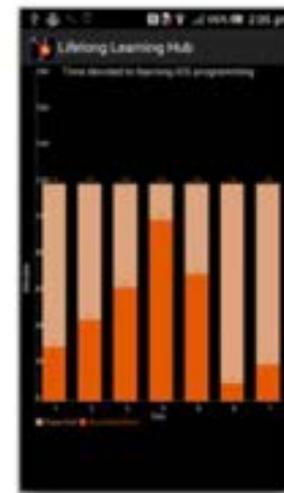
(a) Tap to start/stop a learning activity



b) Learning goals configured by the user



(c) Overall learning-time by goals



(d) Learning time estimated VS invested for a goal in a week

Fig. 1. Binding goals to NFC-tagged learning environments with 3LHub

MANAGEMENT DES LERNPROZESSES

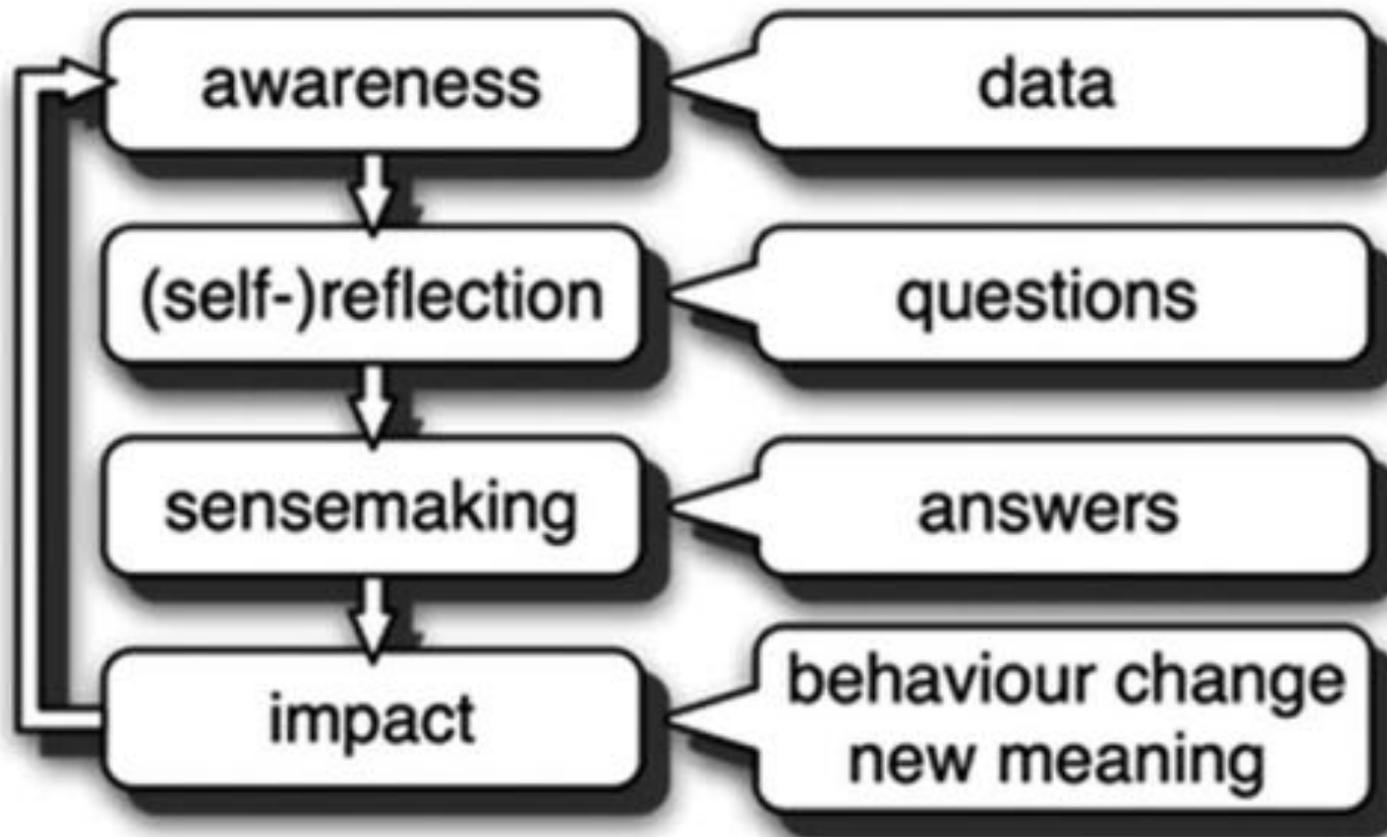


Tabuenca, Kalz & Specht, 2014



LEARNING ANALYTICS FÜR DATENGETRIEBEN INTERVENTIONEN

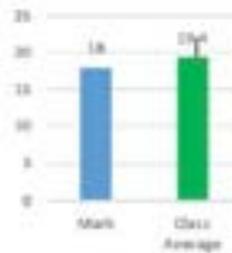




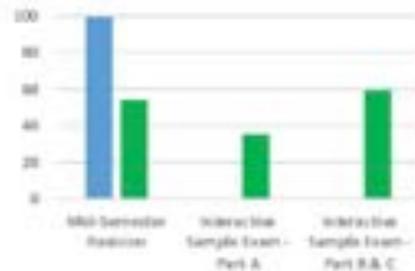


Student name
Student Number
Biology of Cells and Organisms

MID-SEMESTER TEST

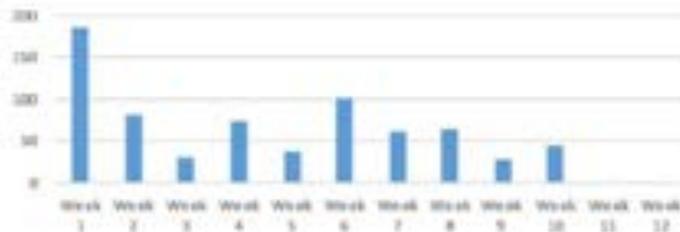


REVISION TEST

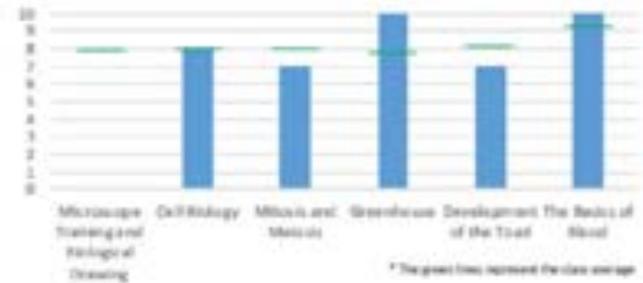


Supplementary Activities	Result	Prelab Fractions	Prelab Graphs
Academic Honesty	6/6	3/4	6/6
Prelab Terminology	5/11	Prelab Probability	3/5
Terminology Crossword	6/6	Prelab Chemistry	4/5
Prelab Chemistry	4/5	Prelab Measurement	4/5
Prelab Measurement	4/5	Prelab Percentage	4/4
Prelab Percentage	4/4	Prelab Fractions	3/4
		Prelab Graphs	6/6
		Prelab Probability	3/5
		Prelab Chemistry	4/5
		Prelab Measurement	4/5
		Prelab Percentage	4/4

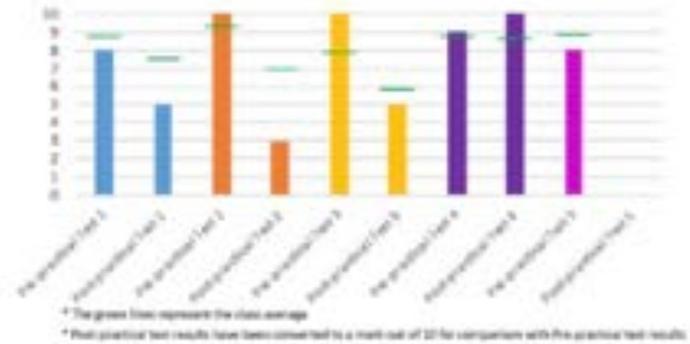
ACCESS TO BIOLOGY LMS SITE



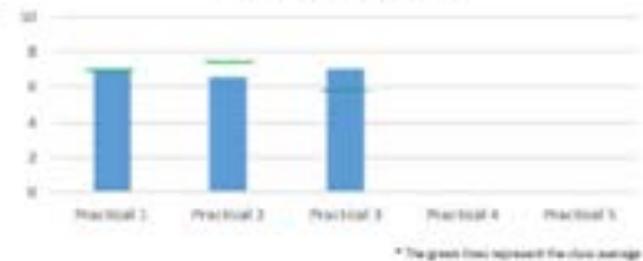
INDEPENDANT LEARNING TASKS

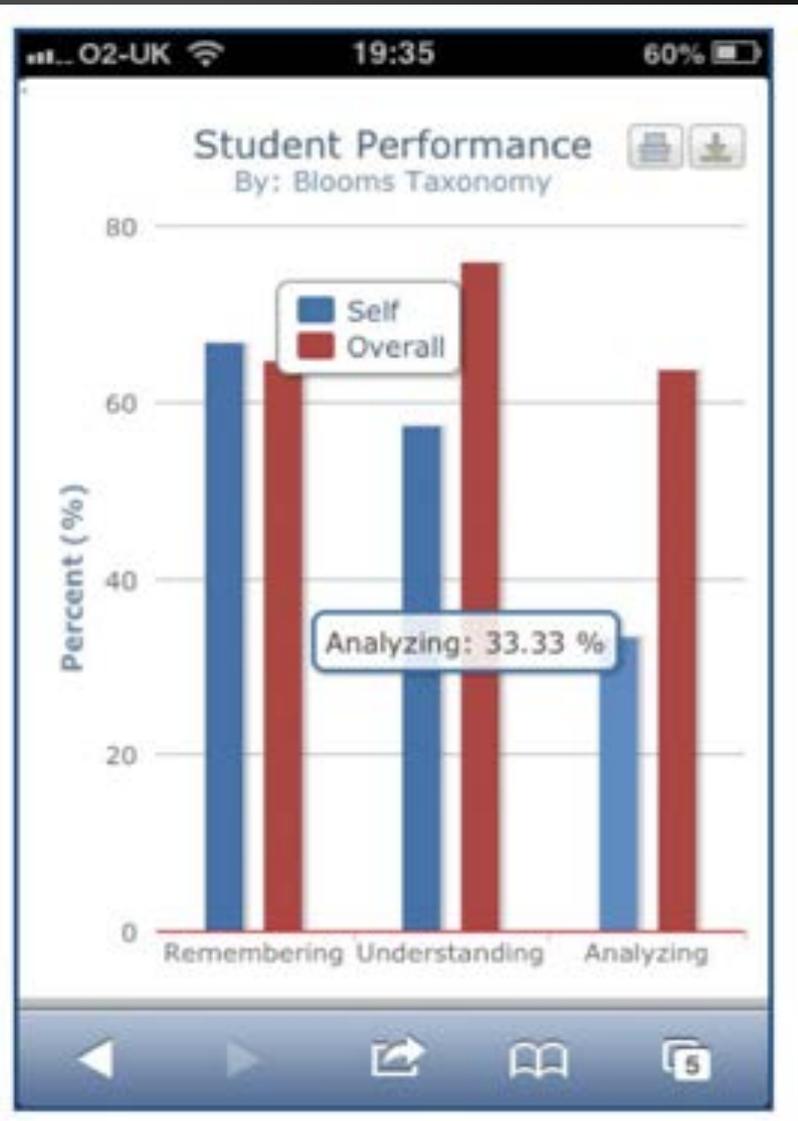
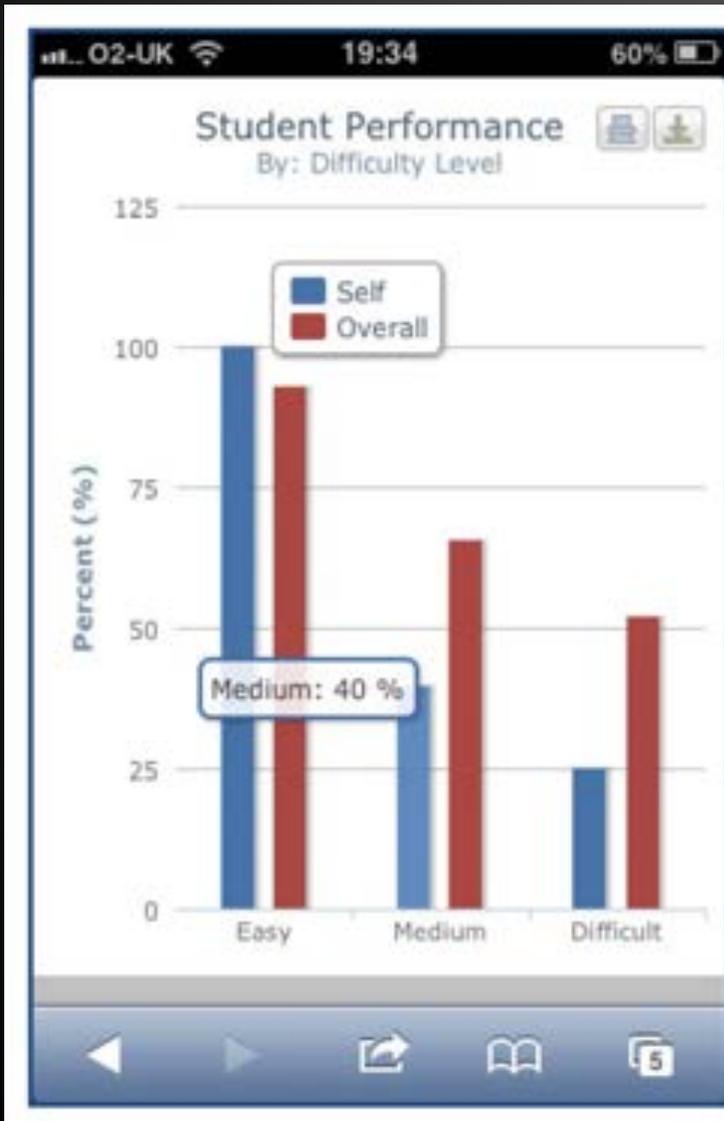


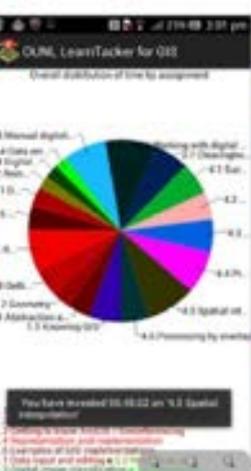
ONLINE PRACTICAL TESTS



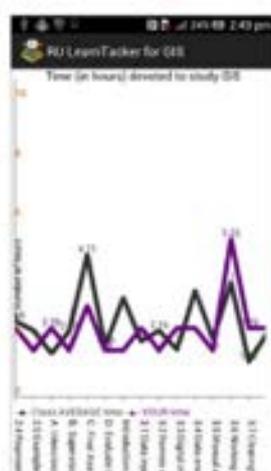
TOTAL PRACTICAL MARKS



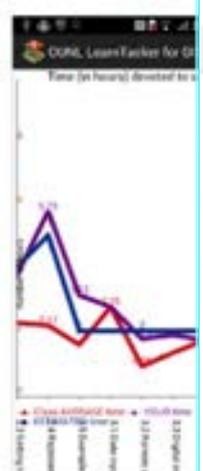




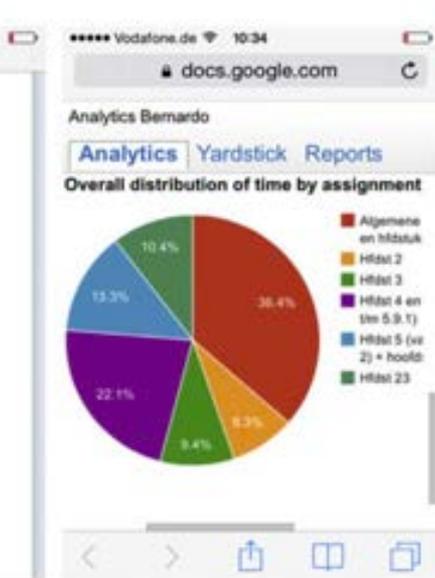
a) Piechart. Time devoted by a student to the learning activities in a course.



b) Linechart. X-axis illustrates activities in a course, Y-axis represents the number of hours devoted to study. My time (violet line) vs. My colleagues' time (black line)



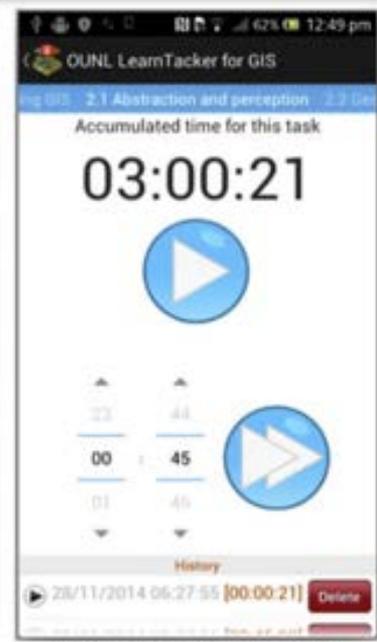
c) Linechart. X-axis illustrates activities in a course, Y-axis represents number of hours devoted to study. My time (violet line) vs. My colleagues' time (red line) vs. My teacher's estimation (black line)



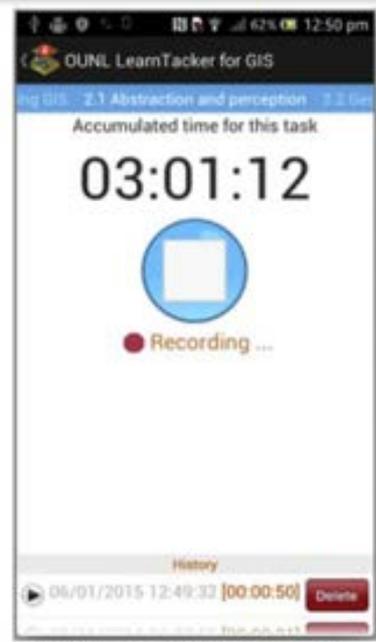
b) Piechart. Time devoted to each learning activity



a) Yardstick comprising the activities scheduled in the

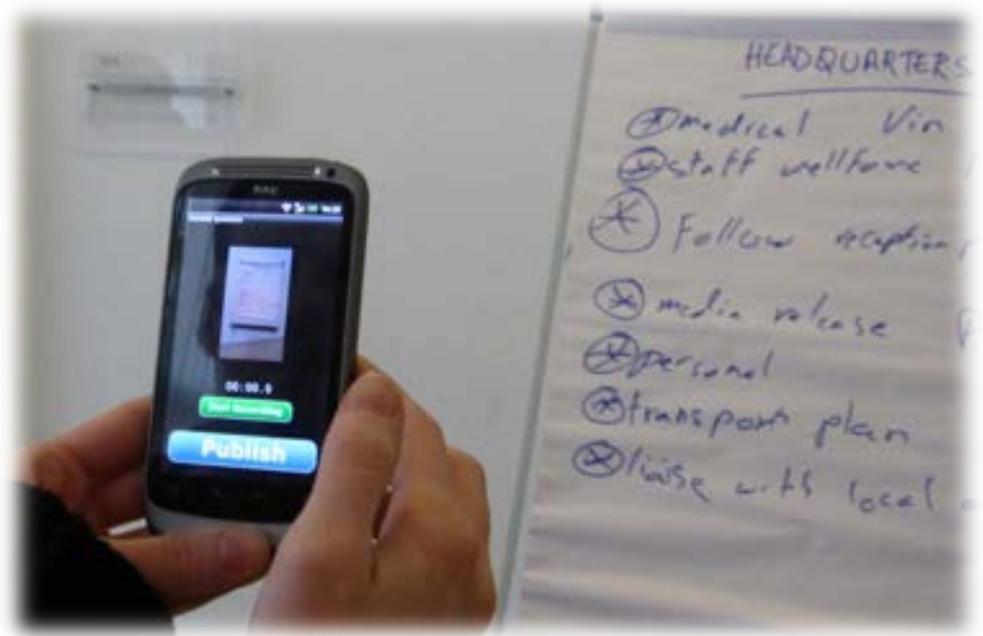


b) Check-in: Tap to start learning activity "2.1 Ab-



b) Check-out: Tap to stop learning activity "2.1 Ab-

REFLEKTION IM LERNPROZESS



MOBILE UND KONTEXTUALISIERTE LERNANGEBOTE



- Trennung von Anwendungskontext und Lernkontext
- Inertes Wissen
- Lerntransfer

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Baxevanis@Flick

INERTES WISSEN



Knowledge that

can be recalled when asked for
but not when needed for problem
solving

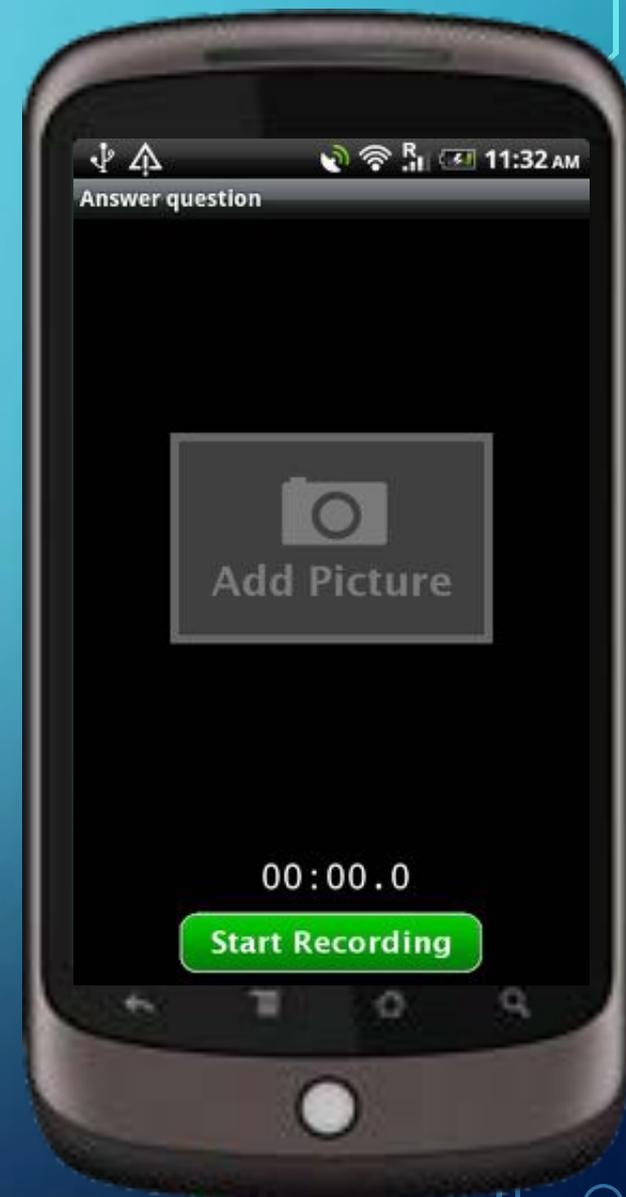
Alfred North Whitehead (1929)

DIE WELT ALS CAMPUS



Ternier, Klemke, Kalz, van
Ulzen, & Specht, 2012

DIE WELT ALS CAMPUS





Welcome to the game that helps you become the greenest employee of the Open Universiteit!

Mindergie

The game is played using the ARLearn app developed by Stefaan Ternier working at CELSTEC. Within the app you will mainly use the *Menu* and the *Back* button of your phone to navigate around. From time to time you will also make use of the built-in camera and microphone as well as a web browser.

All game messages will appear in the list you will see when closing this message by using the *Back* button. Some messages open automatically (like this one) while others open when you click on them. Once you opened a message it will grey out in the list, but stay there until the end of the game.

Some messages will ask you to provide either an answer to a question, recording an audio, take a picture, or even capture a short video. When using media, simply add or record it and then press the *answer* *Publish* button.



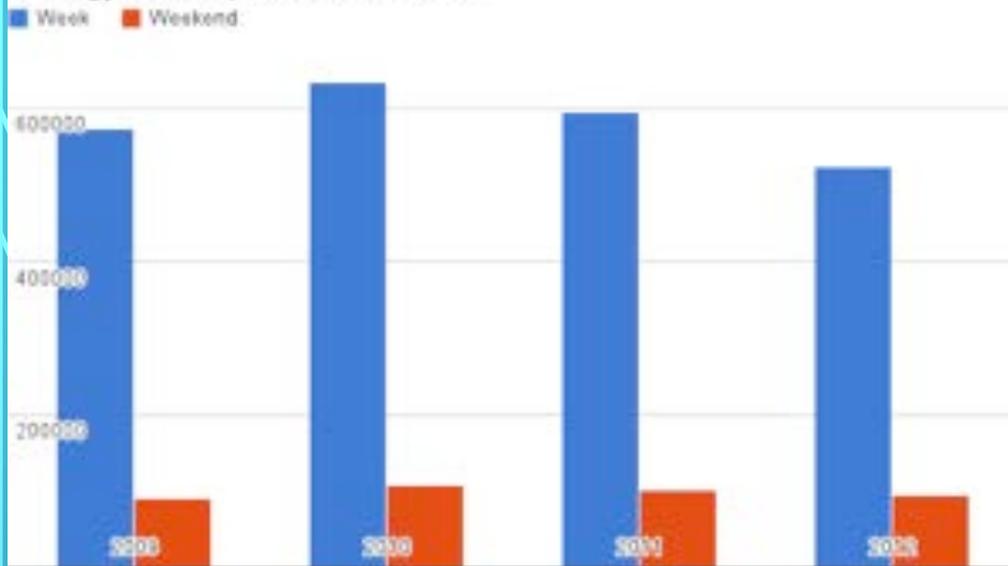
Great you found the Mindergie flags. The first thing you have to do here is to find the small QR code attached to the 'Athabasca' flag pole.

When you found it, simply press the scan icon below and use your camera to scan the code.

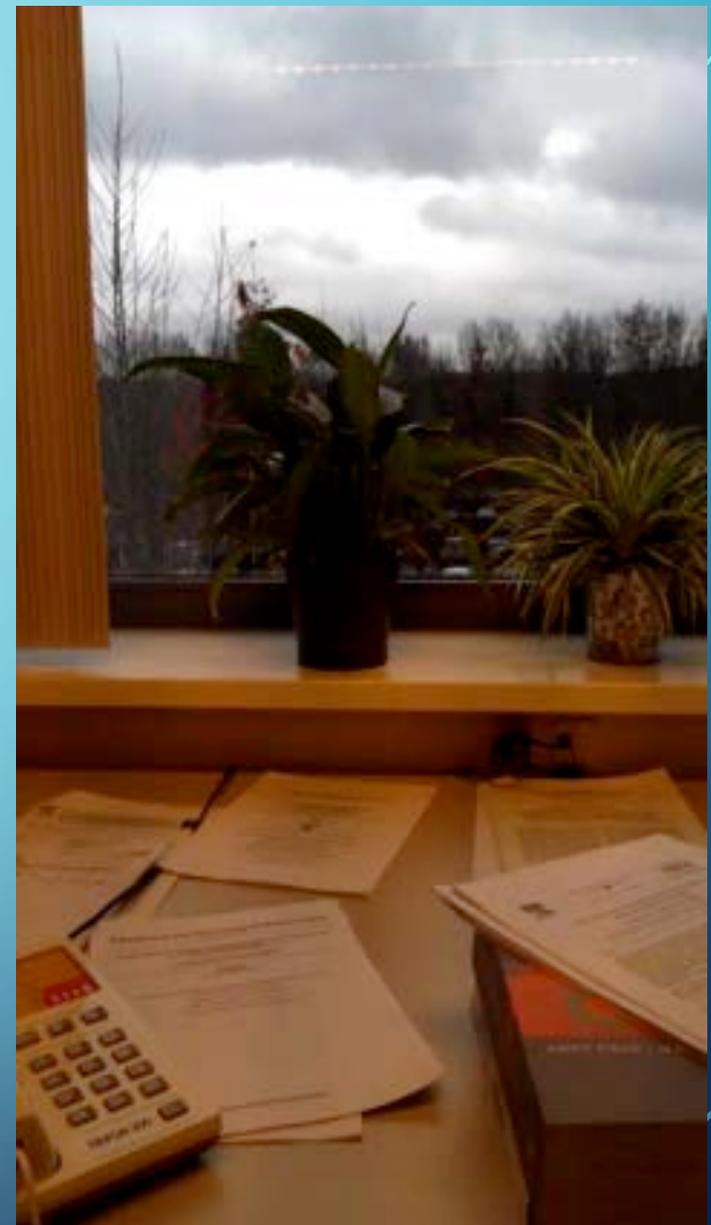
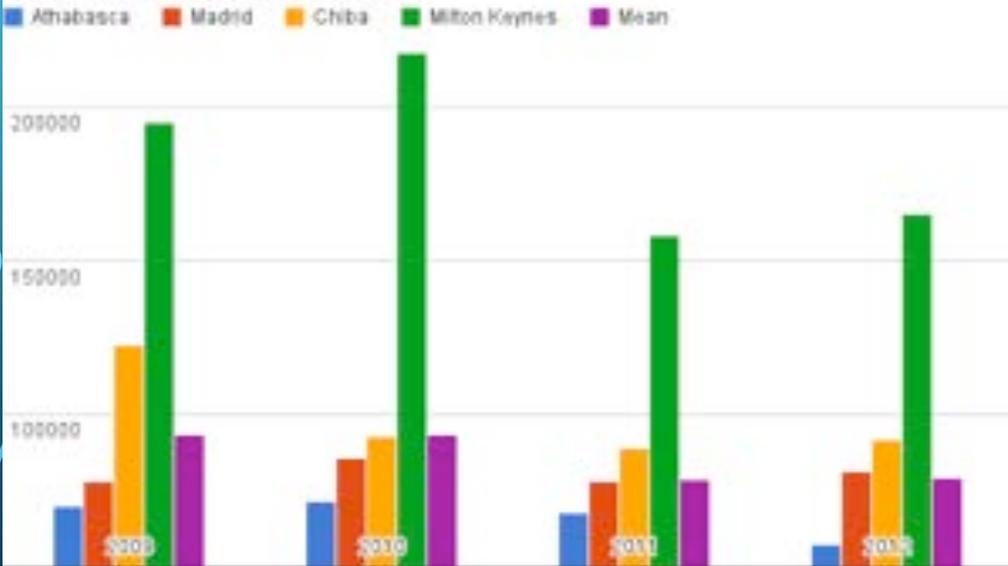


MOBILE LERNSPIELE

Energy consumption week/weekend



Electricity consumption in kWh





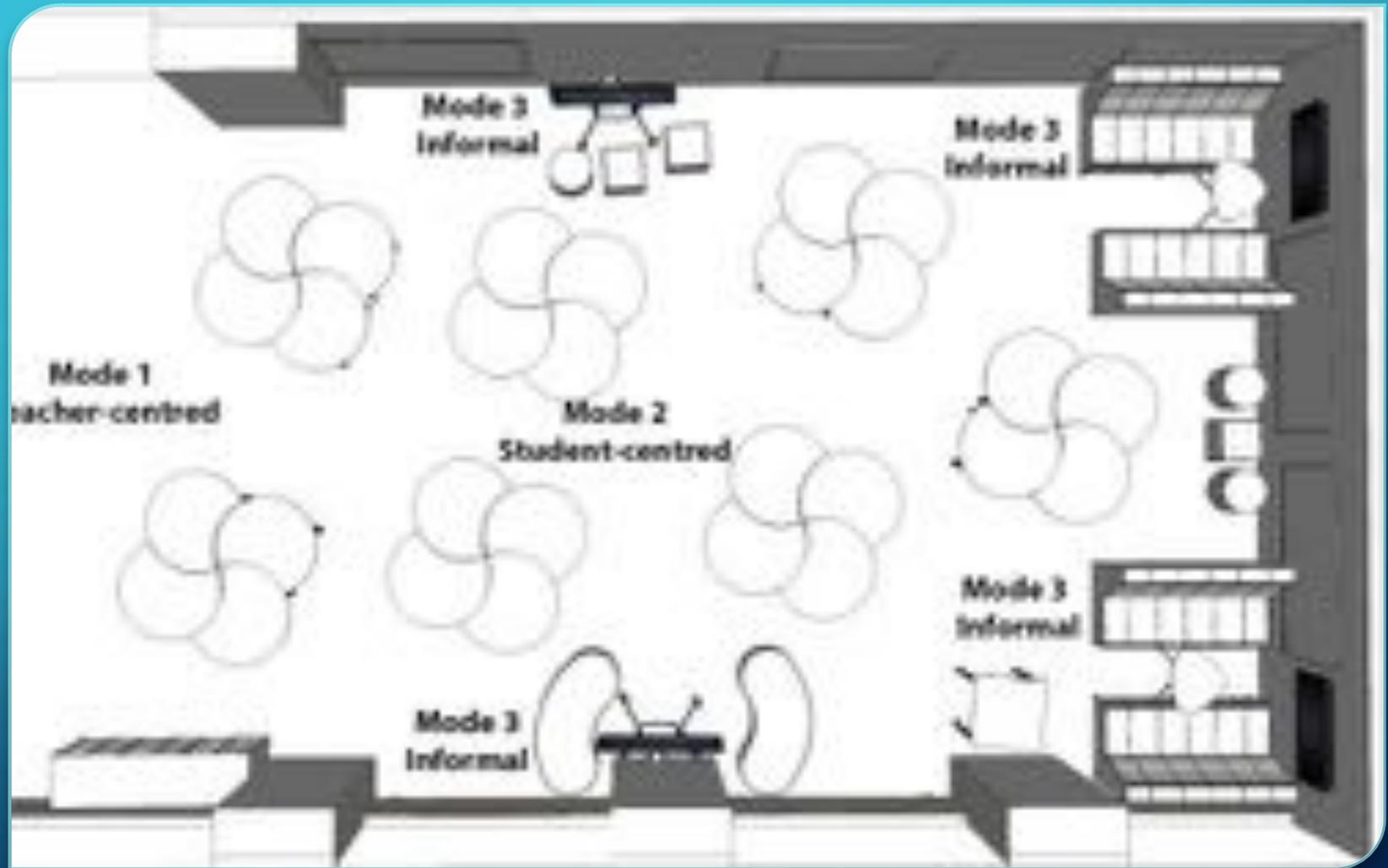
NEUE LERNRÄUME UND MAKERSPACES



Gestaltung von Lernorten hat einen Einfluss auf das Lernen:

- Externe Faktoren (z.B. Luftqualität und Lautstärke) haben über Basisvoraussetzungen hinaus nur geringen Einfluss auf Lernerfolg (Higgins, Hall, Wall, Woolner, & McCaughey, 2005)
- Positive Korrelation zwischen dem Lernerfolg von Studierenden und dem innovativen Design von Lernumgebungen (Byers, Imms, Mahat, Liu, & Knock, 2018)

RETROFITTING VON LEHRRÄUMEN



Korrelationen zwischen der Innovation der Lernraumgestaltung und der Einstellung, Motivation sowie dem Lernerfolg der Lerner (Byers, Imms und Hartnell-Young, 2018)

Abb. 1: Eigenschaften von Makerspaces



Boxberger, 2015



Schön, Ebner & Grandl 2019



MAKERSPACES

The image shows a bright, modern university interior with yellow walls and furniture. In the center, there is a dark rectangular box with white text. The text reads "HOCHSCHULE ALS OFFENER INNOVATIONSRaum". The background features a lounge area with round ottomans, a table, and chairs. There are also some boxes and a trash can in the foreground. The overall atmosphere is clean and contemporary.

HOCHSCHULE ALS OFFENER INNOVATIONSRaum



STURM ODER STURM IM
WASSERGLAS?

TECHNOLOGIE ALS TROJANISCHES PFERD?



KATHEDRALE ODER BAZAAR?



VS



Rabin, Kalman & Kalz (accepted)



Diana Lurrillard

“WE HAVE AMBITION. WE
HAVE TECHNOLOGY. WHAT IS
MISSING IS WHAT
CONNECTS THE TWO“.

NICHT-DETERMINISTISCHE ANSÄTZE

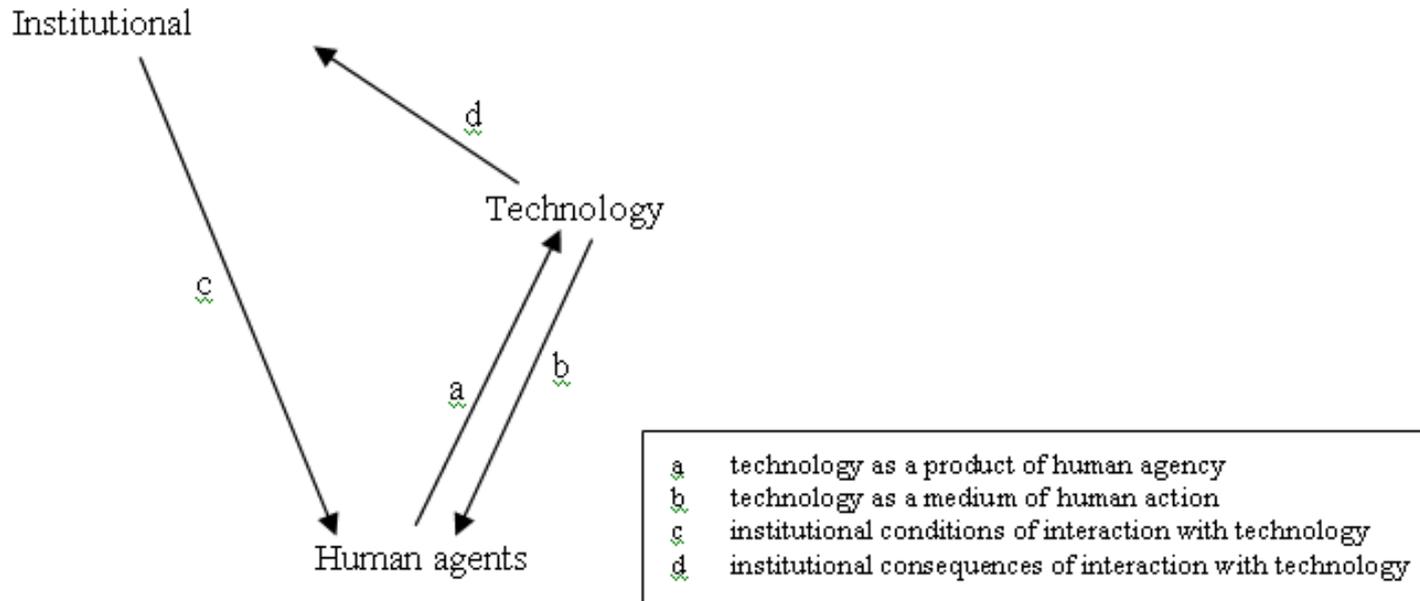


Figure 2: Structurational model of technology (Orlikowski, 1992)

Digital capability and teaching excellence: an integrative review exploring what infrastructure and strategies are necessary to support effective use of technology enabled learning (TEL)

Yet at the core the purposes of universities and of advanced learning remain in many ways unchanged: developing understanding at the very highest level through the engagement with the most current knowledge about a field and the most sophisticated methodological tools available. One of the most pressing of questions for university academics is, therefore, to think in challenging and applied ways about the relationship between digital capabilities and teaching excellence.

Austen, Parkin, Jones-Devitt,
McDonald, & Irwin (2016)

ALLGEMEINE EMPFEHLUNGEN

- Breiteres Verständnis von digitalen Skills ist notwendig
- Technologie alleine ist kein Transformationsfaktor für bessere Lehre
- Vermeidung eines technologischen Determinismus
- Keine Silos von ExpertInnen, sondern ein breiter Diskurs unter Lehrenden

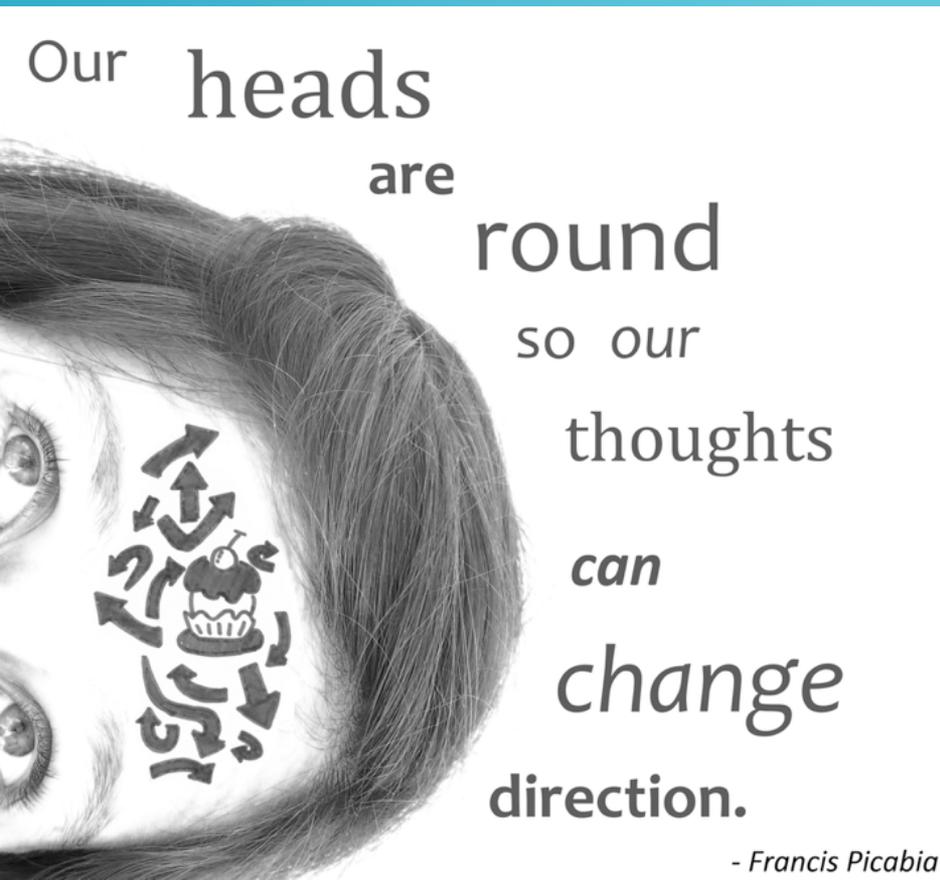
Austen, Parkin, Jones-Devitt,
McDonald, & Irwin (2016)

POSITIVE EINFLUSSFAKTOREN

- Digitale Skills als Teil der Hochschulstrategie
- Inklusive Ansätze: Umgang mit Widerstand
- Förderung und Anerkennung von digitalen Skills
- Professionelle Entwicklung der einzelnen Lehrenden muss im Mittelpunkt stehen

Austen, Parkin, Jones-Devitt,
McDonald, & Irwin (2016)

Vielen Dank!



Our heads
are
round
so our
thoughts
can
change
direction.

- Francis Picabia



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