Universität Zürich[UZH]
Institut für Erziehungswissenschaft

Digitale Hochschuldidaktik
Von der Oberflächen- zur Tiefenstruktur

Sprachenzentrumskonferenz 2022: 20 Jahre Sprachenzentrum UZH & ETHZ
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Übersicht

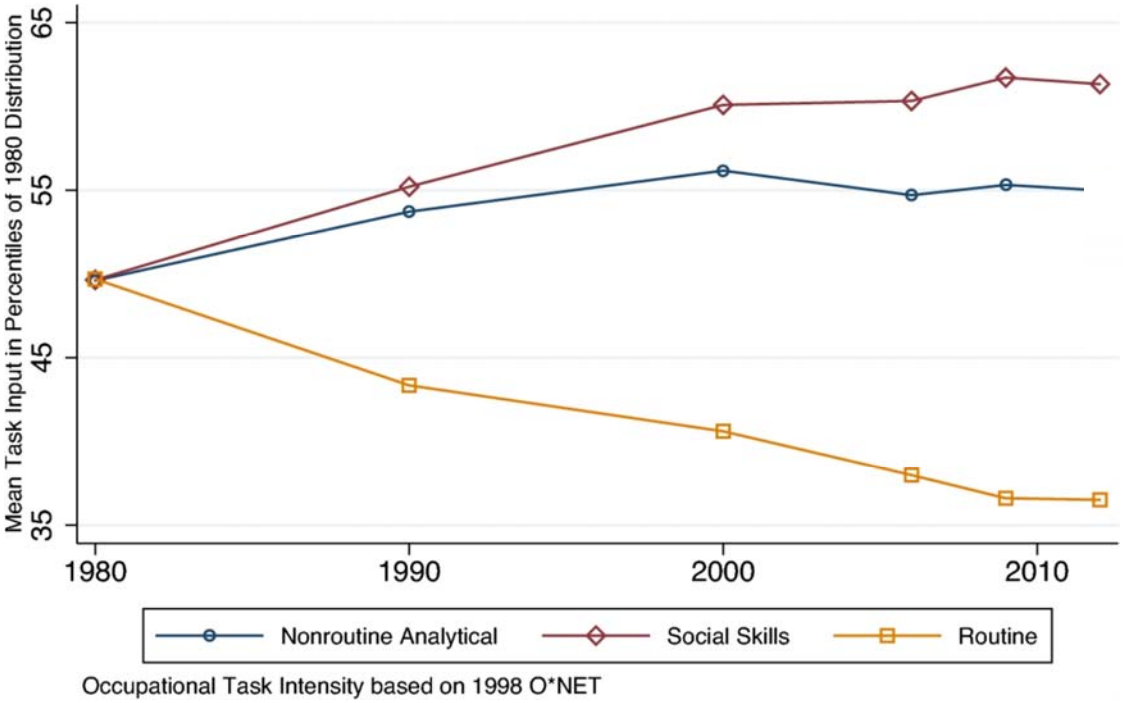
- Verbessert sich die Hochschullehre mit digitalen Technologien?
- Perspektivenwechsel von der Oberflächen- zur Tiefenstruktur
- Potenziale für das Sprachenlernen

Verbessert sich die Hochschullehre mit digitalen Technologien?

Education 4.0?

- https://www.youtube.com/watch?v=kOnkI0tQINA

Wandel der Kompetenzanforderungen (Deming, 2017; Autor et al., 2003)



Google Translate

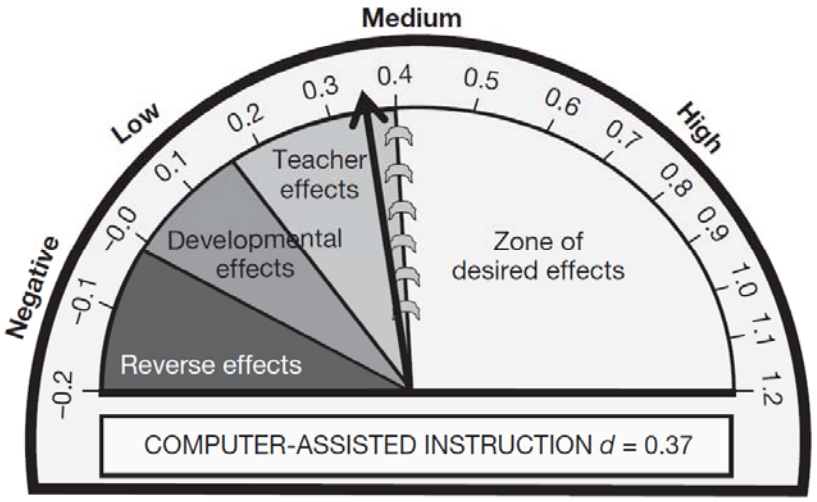
DeepL

OpenAI GPT-3

Potenziale digitaler Medien für Lehren und Lernen (Petko, 2020)

- Anschaulicher (Bilder, Videos, Animationen, Multimedia, 3D VR)
- Interaktiver (Hypertext, Intelligent Tutoring Systems, Simulationen, Games)
- Adaptiver (Learning Analytics, eAssessment)
- Kreativer (Textverarbeitung, Multimediaproduktion, Programmierung)
- Kommunikativer (Chats, Foren, Videokonferenzen, Soziale Netzwerke)
- Strukturierter (Lernplattformen, Schülerinformationssysteme)
- Motivierender (Wahlmöglichkeiten, Kompetenzerleben, Soziale Eingebundenheit)

Digitale Medien – Besseres Lernen? (Hattie, 2008)



www.visiblelearningmetax.com

KEY	
Standard error	0.059 (Medium)
Rank	71st
Number of meta-analyses	81
Number of studies	4,875
Number of effects	8,886
Number of people (18)	3,990,028

Neuere differenzielle Befunde

- Immer wieder kleine Effektstärken (.29) (Bernard et al., 2018)
- Offene Lernformen (.42) > Direkte Instruktion (.31) (Tamim et al., 2011)
- Qualifizierte Dozierende (.67) > Unqualifizierte Dozierende (.19) (Archer et al., 2014)
- Grössere Effekte bei spezifischen Medien, z.B. Simulationen (.85) (Chernikova et al., 2020)

Kernfaktoren guter Hochschullehre (Schneider & Preckel, 2017)

Technologie zeigt kleine und mittlere positive Effekte.

Absolute Frequencies of Data Points and Percentage of Variables by Effect Size (Ordered by the Comb and Large Effects)

	Absolute frequency of data points			% of variables			
	Students[a]	Effect sizes	Variables	No effect	Small effect	Medium effect	Large effect
Overall	1,920,239	3,330	105	12	36	36	15
Instruction variables	208,711	1,595	42	5	26	45	24
Social interaction	26,860	123	5	0	0	40	60
Stimulating meaningful learning	49,272	229	9	0	22	56	22
Assessment	41,493	316	8	0	25	50	25
Presentation	46,157	354	9	0	33	33	33
Technology	29,022	401	6	17	33	50	0
Extracurricular training programs	15,907	172	5	20	40	40	0
Student variables	1,711,528	1,735	63	18	43	30	10
Intelligence and prior achievement	74,711	95	4	0	0	50	50
Strategies	133,757	343	18	11	28	50	11
Motivation	137,880	390	12	17	42	25	17
Personality	1,093,174	694	16	31	44	25	0
Context	272,006	213	13	15	77	8	0

Note. No effect = $|d| < .11$; small effect = $.11 \leq |d| < .35$; medium effect = $.35 \leq |d| < .66$; large effect = $|d| \geq .66$.
[a] Estimated by replacing missing values of a meta-analysis by the median value of all meta-analyses.

Warum sind die Befunde so schwach?

Perspektivenwechsel von der Oberflächen- zur Tiefenstruktur

Educational Technology Trends (NMC, 2012; Pelletier et al., 2022)

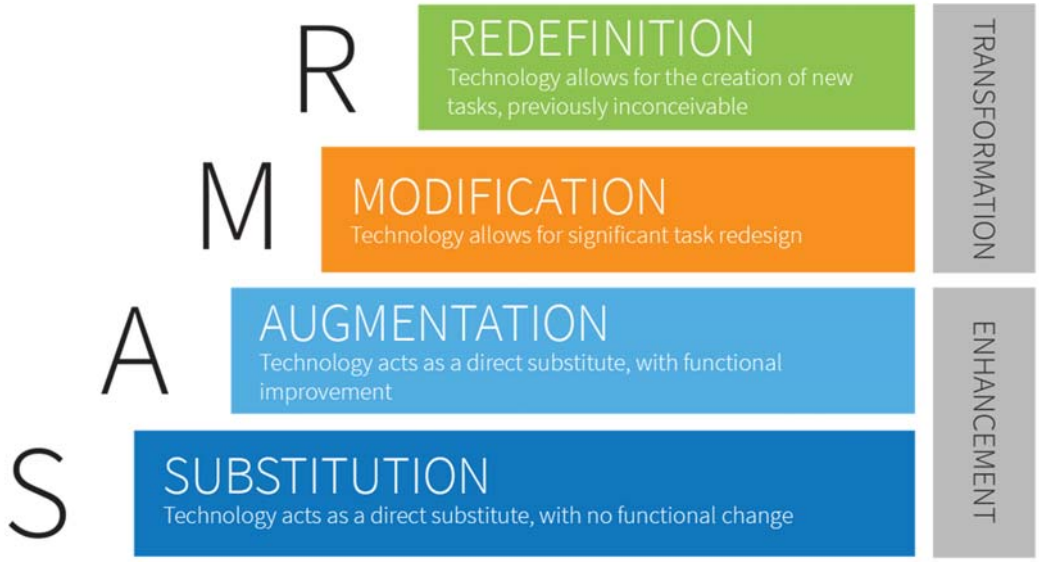
2012

- Mobile Apps
- Tablet Computing
- Game-Based Learning
- Learning Analytics
- Gesture-based Computing
- Internet of Things

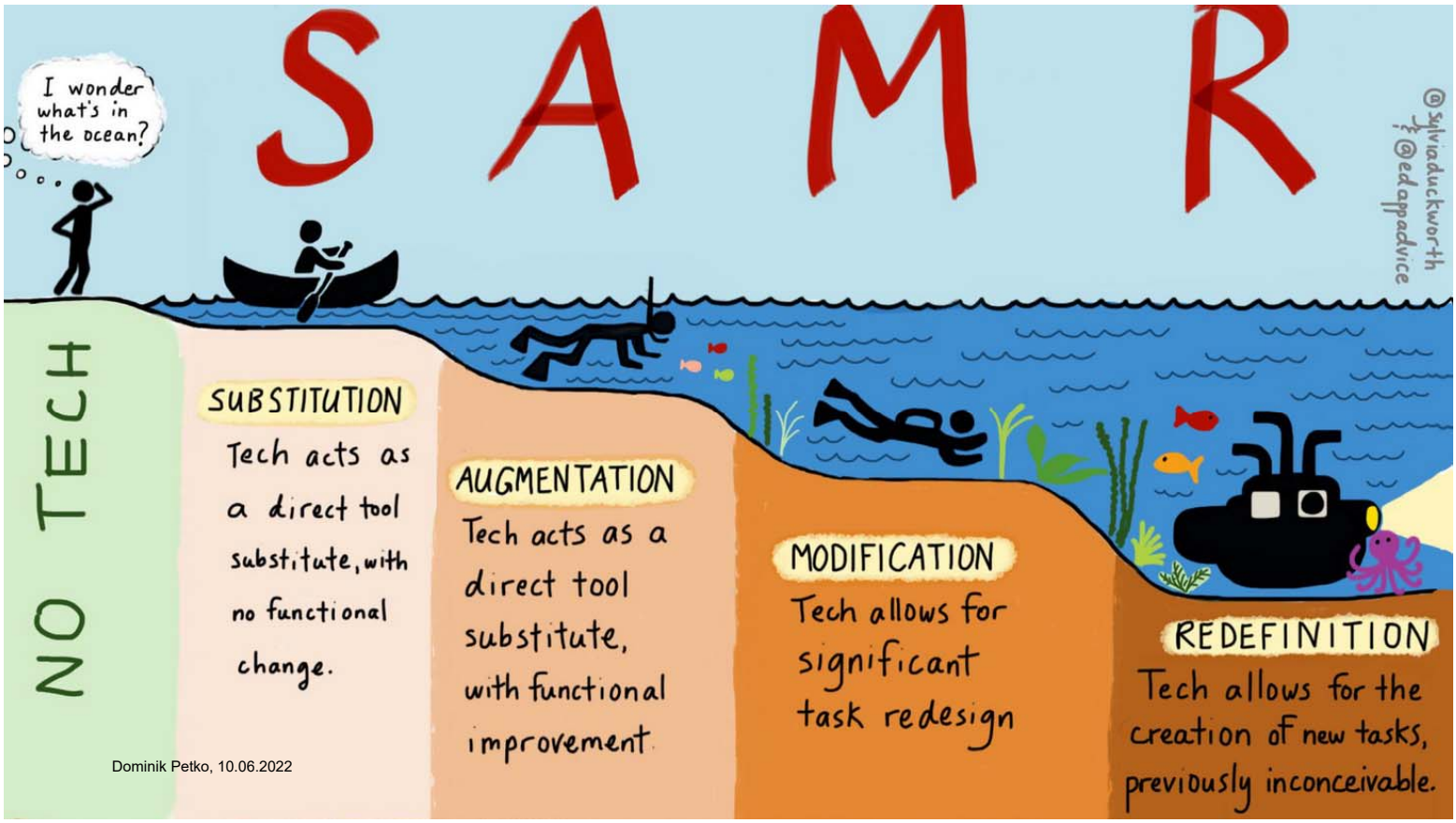
2022

- AI for Learning Analytics
- AI for Learning Tools
- Hybrid Learning Spaces
- Mainstreaming Hybrid/Remote
- Microcredentials
- Professionlal Development for Hybrid/Remote

Ein Modell für die Oberflächenstruktur: SAMR (Puentedura, 2006)



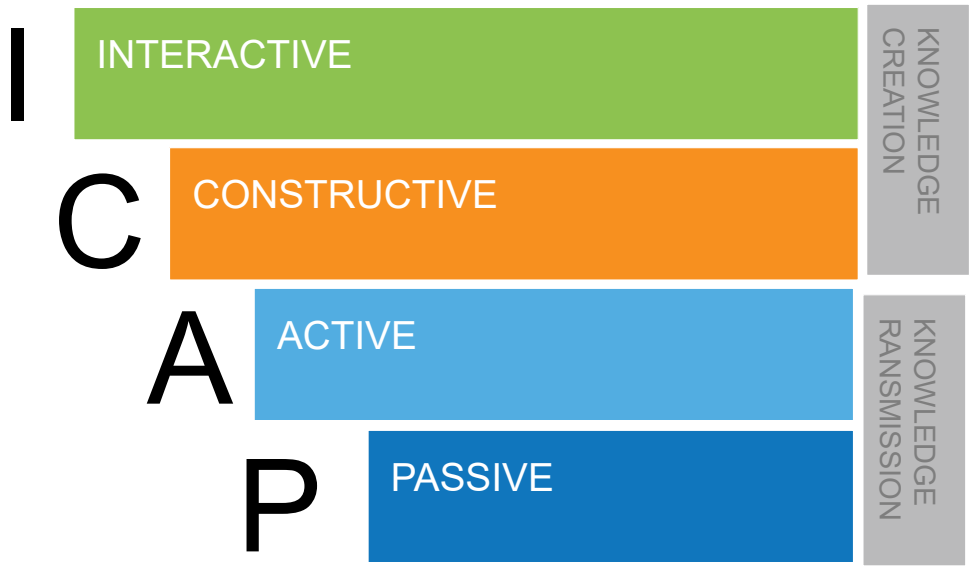
https://www.schoology.com/sites/default/files/samr_r2.png



Konzeptionelle Probleme des SAMR Modells (Hamilton, 2016)

- Rein technologiezentriertes Modell («Tech allows for…»)
- Problematische Innovationsorientierung («Neomanie»)
- Kontextneutrales Modell («anytime anywhere»)
- Theoretisch nicht anschlussfähig
- Empirisch nicht erwiesen

Ein Modell für die Tiefenstruktur: ICAP (Chi & Wylie., 2014)



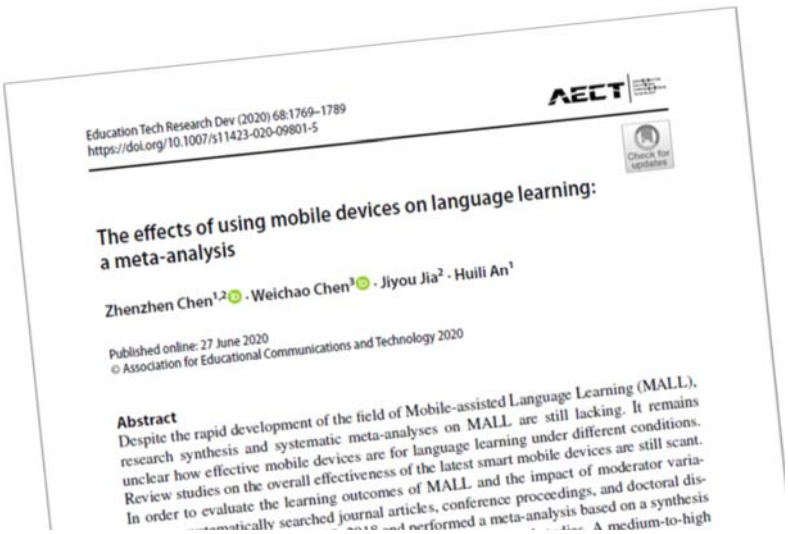
Mobile Geräte ➔ Entdeckendes Lernen (Sung et al., 2016)

Variable	Category	Number of studies (k)	Number of effect sizes	Proportion of studies	Proportion of effect size	Effect size (g)
Teaching method	1. Not mentioned	9	84	0.082	0.200	0.186
	2. Lectures	13	45	0.118	0.107	0.556
	3. Discovery and exploration	13	25	0.118	0.060	0.920
	4. Cooperative learning	9	60	0.082	0.143	0.261
	5. Problem-solving	10	32	0.091	0.076	0.572
	6. Game-based learning	4	7	0.036	0.017	0.404
	7. Self-directed study	34	122	0.309	0.291	0.521
	8. Podcasting	1	6	0.009	0.014	0.153
	9. Computer-assisted testing	6	8	0.055	0.019	0.660
	10. Project-based learning	1	7	0.009	0.017	2.551
	11. Mixed	10	23	0.091	0.055	0.847
Domain subject	1. Language arts	41	169	0.347	0.403	0.593
	2. Social studies	5	10	0.042	0.024	0.776
	3. Science	27	78	0.229	0.186	0.578
	4. Mathematics	12	41	0.102	0.098	0.338
	5. Multidisciplinary	1	6	0.008	0.014	0.333
	6. Specific abilities	5	24	0.042	0.057	0.103
	7. Health-care programs	7	18	0.059	0.043	0.535
	8. Education	3	6	0.025	0.014	0.381
	9. Psychology	3	7	0.025	0.017	0.467
	10. Computer and information technology	14	60	0.119	0.143	0.716

Fachspezifische Effekte, z.B. Sprachenlernen (Chen et al., 2020, g = .72)

Table 2 Effect sizes of moderator variables

Category	k	g
Instructional approach		
1. Self-directed learning	43	0.768
2. Collaborative learning	7	0.802
3. Situated learning	11	0.795
4. Flipped learning	3	0.769
5. Game learning	9	0.570
6. Teacher-led	5	0.373
7. Assessment	3	1.168
8. Others	3	0.375
Target language skill		
1. Listening	4	1.08
2. Reading	14	0.375
3. Speaking	5	1.056
4. Vocabulary	23	0.772
5. Writing	4	1.041


Education Tech Research Dev (2020) 68:1769–1789
https://doi.org/10.1007/s11423-020-09801-5

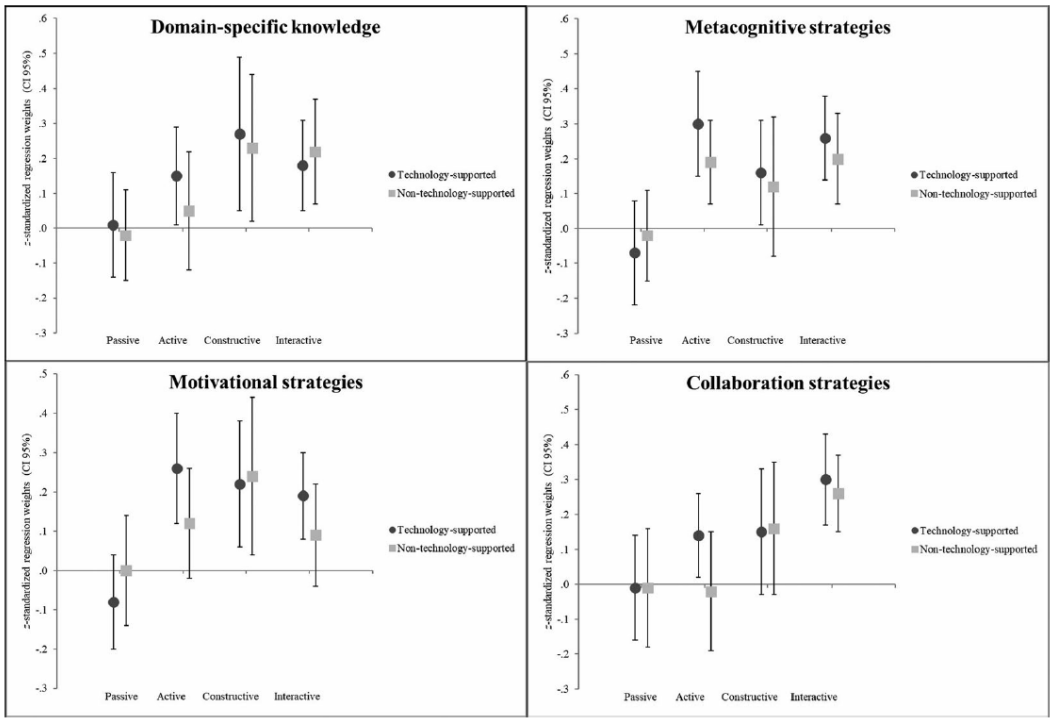
The effects of using mobile devices on language learning: a meta-analysis

Zhenzhen Chen[1,2] · Weichao Chen[3] · Jiyou Jia[2] · Huili An[1]

Published online: 27 June 2020

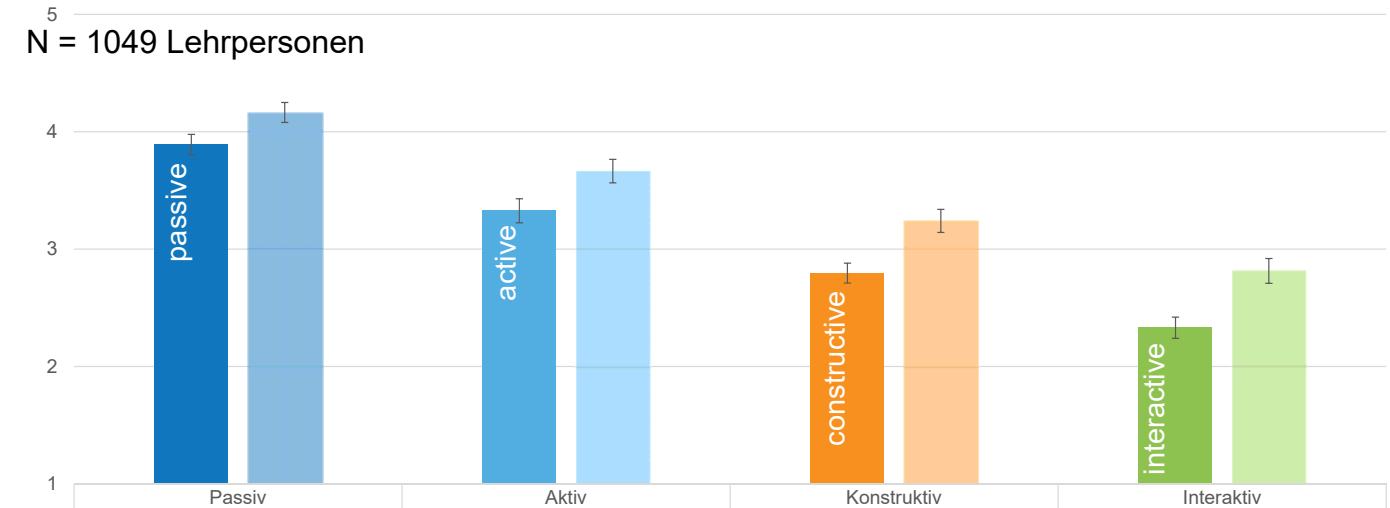
Abstract
Despite the rapid development of the field of Mobile-assisted Language Learning (MALL), research synthesis and systematic meta-analyses on MALL are still lacking. It remains unclear how effective mobile devices are for language learning under different conditions. Review studies on the overall effectiveness of the latest smart mobile devices are still scant. In order to evaluate the learning outcomes of MALL and the impact of moderator varia- systematically searched journal articles, conference proceedings, and doctoral dis- performed a meta-analysis based on a synthesis

Erste Befunde zum ICAP-Modell (Wekerle et al., 2020)



ICAP in Gymnasien und Berufsschulen im Kanton Zürich

N = 1049 Lehrpersonen



	Passiv	Aktiv	Konstruktiv	Interaktiv
Ø AB	3.89	3.33	2.80	2.33
Ø BB	4.16	3.66	3.24	2.81

Potenziale für das Sprachenlernen

Passive Ansätze des digitalen Sprachenlernens

- Online-Sprachlektionen
- Fremdsprachiger Content

OPEN CULTURE
The best free cultural & educational media on the web

YouTube

NETFLIX

theguardian

PLAY SRF

EL PAÍS

Aktive Ansätze des Sprachenlernens

- Flashcards & Quizzes
- Sprachlernapps

Konstruktive Ansätze des Sprachenlernens

- Textverarbeitung
- Foto & Video
- Lerntagebücher
- Lernportfolios

Interaktive Ansätze des Sprachenlernens

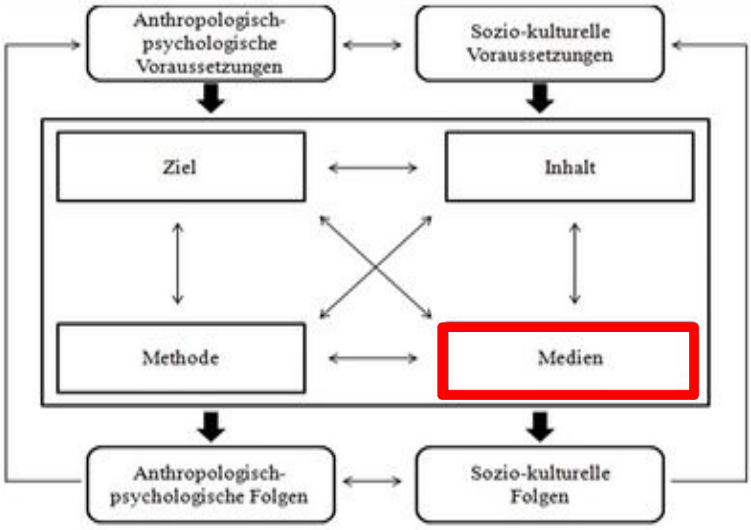
- Language Exchange Apps
- AI Chats & Social Robots

Interview mit GPT-3

- https://www.youtube.com/watch?v=PqbB07n_uQ4

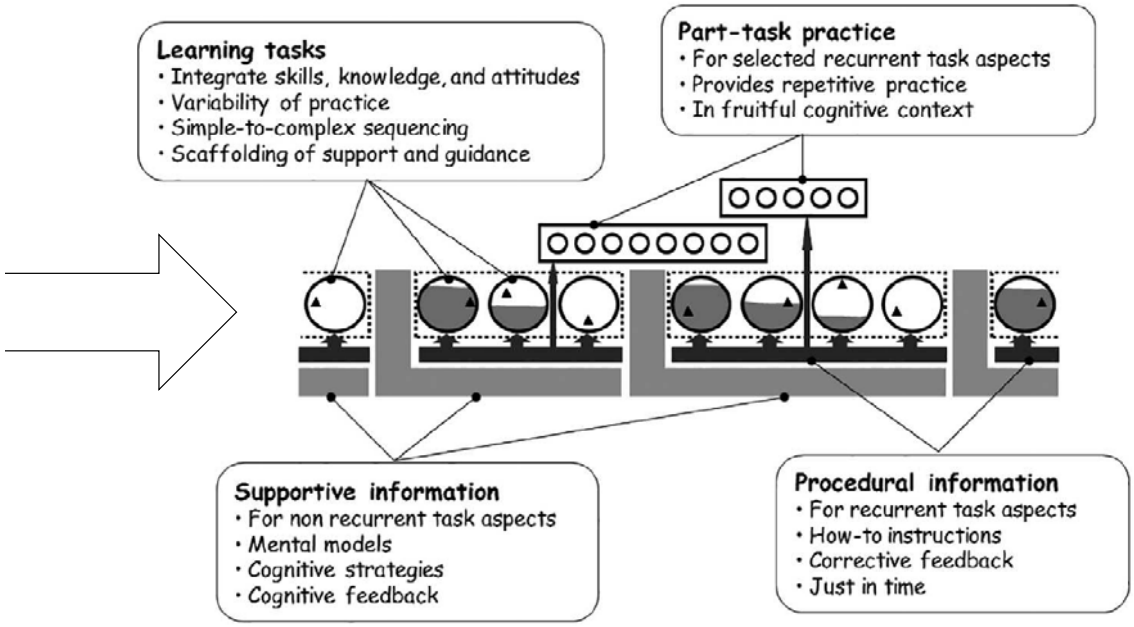
Was heisst das für die Hochschuldidaktik?

Medien als Teil der didaktischen Planung (Beaven et al, 2021; Heimann, Otto & Schulz, 1965)



Neue didaktische Planungsmodelle (z.B. 4C/ID) (van Merriëboer, & Kirschner, 2002)

I
C
A
P



Schlussbemerkungen

- Digitale Medien machen das Lernen nicht automatisch besser
- Auf Tiefenstrukturen statt auf Oberflächenstrukturen achten (ICAP statt SAMR)
- Digitale Technologien können unterschiedliche Lernaktivitäten sinnvoll unterstützen

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