

Wie kann man Engagement in berufsbegleitender Online-Lehre fördern? Erkenntnisse aus drei Pilotstudien

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(IPSDS/Universität Mannheim)

A man in a dark blue polo shirt is on the left, gesturing with his hands while talking to a woman on the right. The woman is wearing a purple button-down shirt and glasses, and she is smiling. They are standing in front of a light-colored brick wall.

INTERNATIONAL PROGRAM IN SURVEY AND DATA SCIENCE

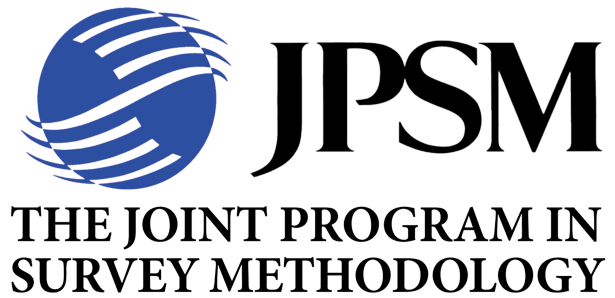
offered through the University of Mannheim and the Joint Program in Survey
Methodology

(Universities of Maryland and Michigan, Westat)

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Projektkoordination & Finanzierung

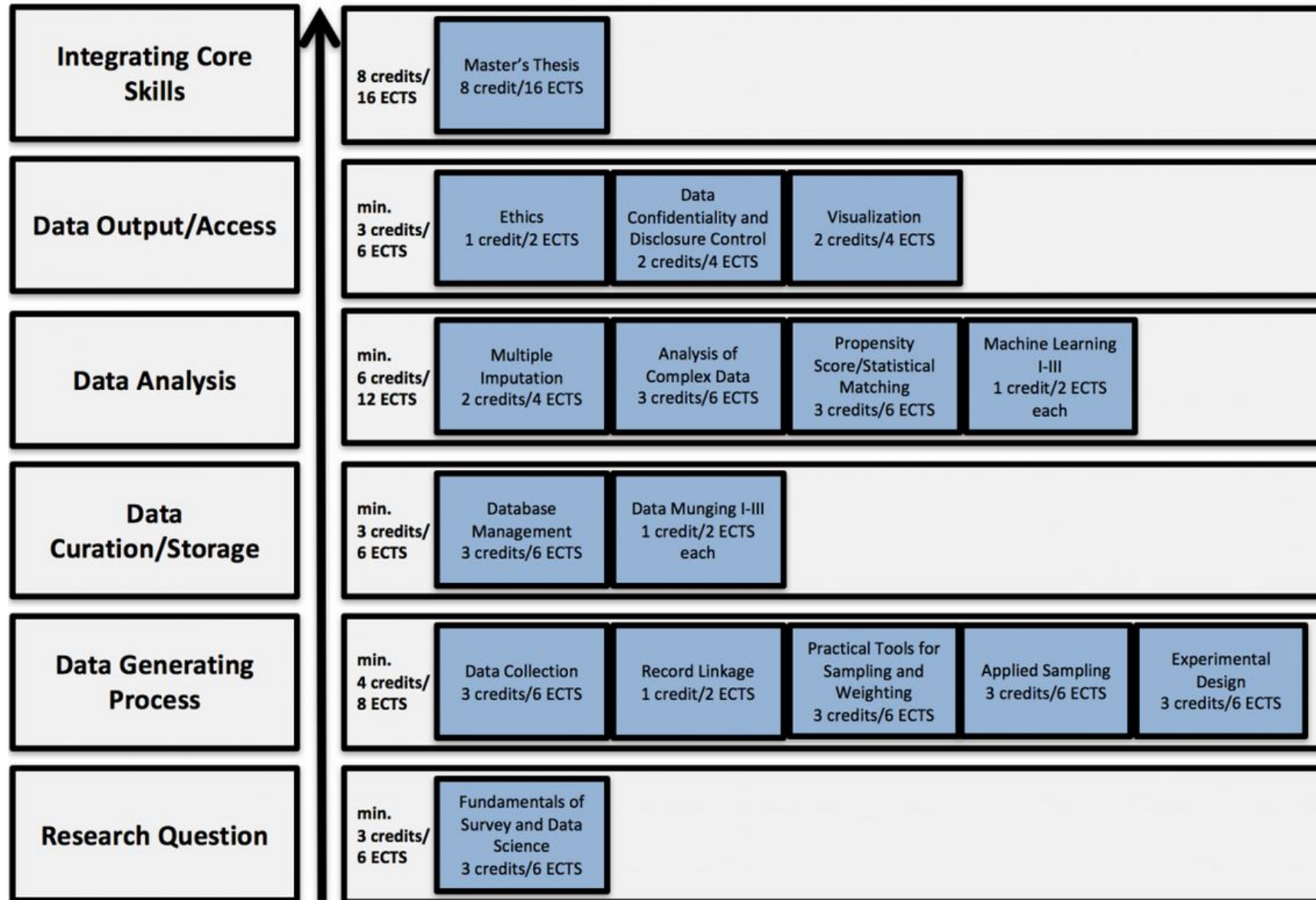


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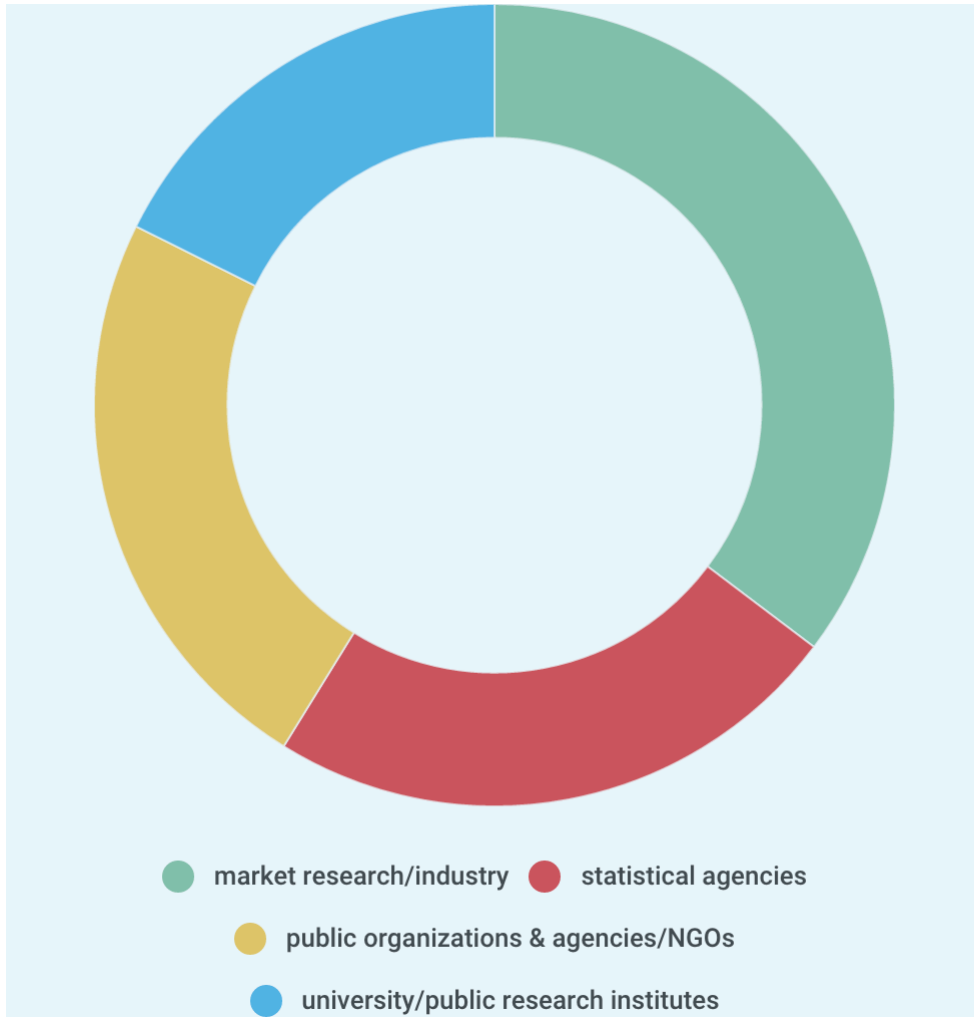
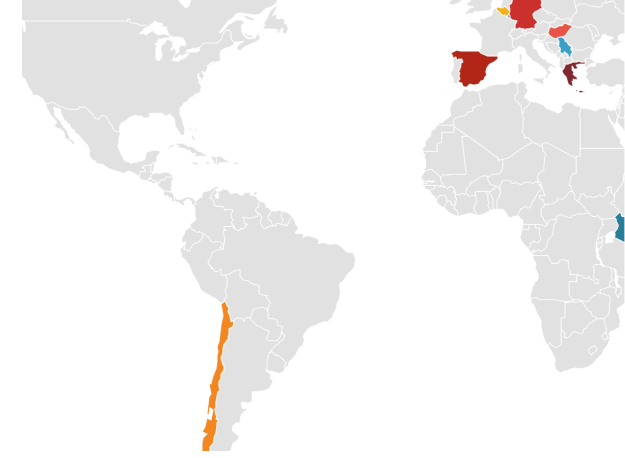
Federal Ministry
of Education
and Research



IPSDS Struktur: Baukastenlernen



IPSDS Test-Kohorte



- **16** TeilnehmerInnen (10 f + 6 m)
- Medianalter **29,5** Jahre (Min-22; Max-55)
- **9** von 16 haben noch nie an Onlinekurs teilgenommen
- Alle haben mindestens B.A.
- **40,76** Arbeitsstunden/Woche (Min-35; Max-55)

IPSDS Struktur



2. Model Eval Validation
January 12, 2016 Mediasite Presenter

3. K-Means Clustering
January 12, 2016 Mediasite Presenter

Homework Assignment 1
data file for homework n
Tasks for Homework Num

Quiz 2
HW Number 1 Solutions

This is a .R file that can be opened using Notepad or other text editor (or Word tasks of HW 1.

www.jpsmclasses.umd.edu/Mediasite/Play

Machine Learning Methods/Techniques

- There are many different machine learning methods available
- Many are non-parametric in nature and while a functional form can be specified, it is generally not a natural byproduct of the method
- Wu et al. (2008) provide an overview of ten of the top machine learning algorithms including (see <http://bit.ly:/liWTir>):
 - K-means Clustering
 - PageRank
 - K-nearest neighbors

Week 3

Bluejeans Join Meeting [Tuesday, 02/16/

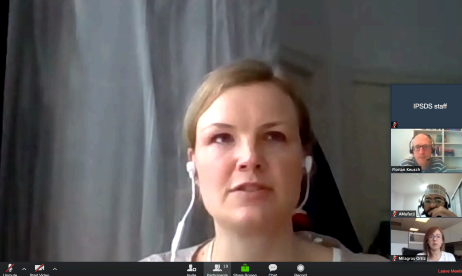
4. K-Nearest Neighbors
January 12, 2016 Media

5. CARTS
January 12, 2016 Media

HW 2 Assignment
Tasks for
Datasets

Quiz 3
HW 2 Solutions

Here is the R script file cc



IPSDS Struktur: Flipped Classroom

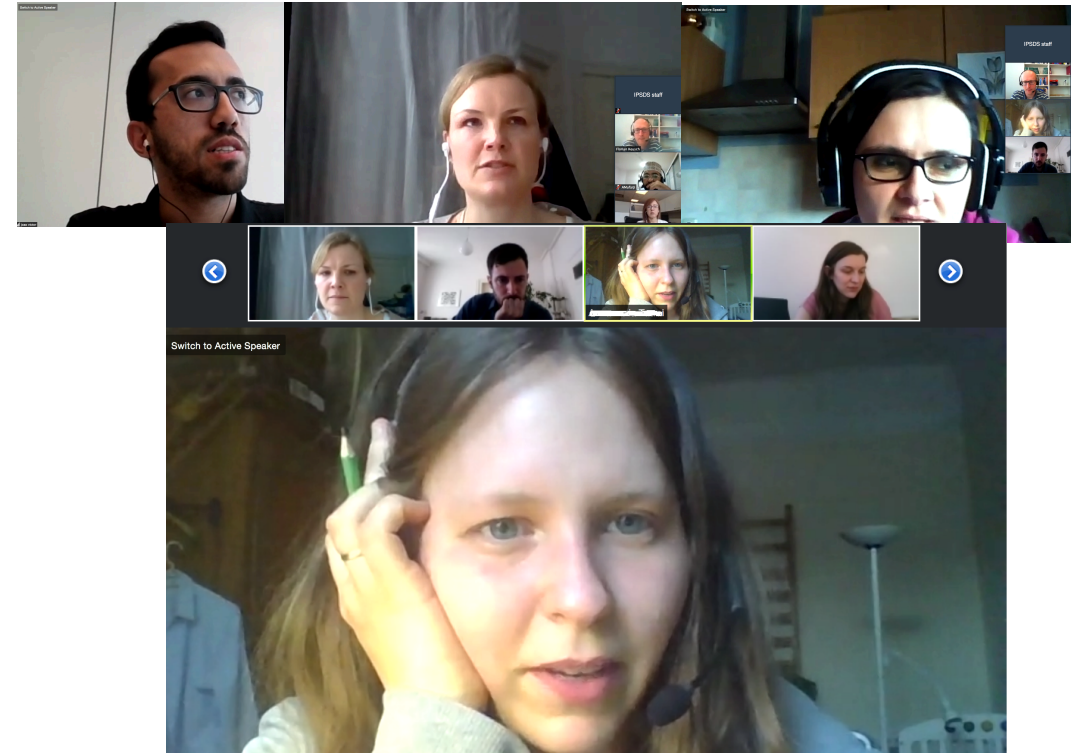
Umgang mit Lernmaterialien

The screenshot shows a course management system interface. On the left, there is a navigation menu with items like '2. Model Eval Validation', '3. K-Means Clustering', 'Homework Assignment 1', 'Quiz 2', and 'HW Number 1 Solutions'. The main area displays a video player with a slide titled 'Machine Learning Methods/Techniques'. The slide content includes:

- There are many different machine learning methods available
- Many are non-parametric in nature and while a functional form can be specified, it is generally not a natural byproduct of the method
- Wu et al. (2008) provide an overview of ten of the top machine learning algorithms including (see <http://bit.ly/liWTir>):
 - ★ K-means Clustering
 - ★ PageRank
 - ★ K-nearest neighbors
 - ★ Support Vector Machines
 - ★ Decision Trees and Classification and Regression Trees
 - ★ Apriori Algorithm
 - ★ The EM Algorithm (Expectation-Maximization)
 - ★ Naïve Bayes
 - ★ Ensemble Methods (like AdaBoost and Random Forests).

The video player shows a timestamp of 02:15 / 44:08 and is currently playing.

Vertieftes Lernen durch Aktivitäten



Abschlussprüfung

Arbeit an Kursaufgaben (Strikte Fristen)

Engagement

- Fokus auf Engagement als Gegenmittel zu Studienabbrüchen und Leistungsunterschieden
- Engagement ist gestaltbar
- Multidimensionales Konstrukt (Finn & Zimmer, 2012)
- Kein abschließender Konsens bzgl. Definition und dimensionaler Struktur (Järvelä, S. & Renninger, 2014)

Engagementist...

- ...Interaktion mit der Lernumgebung

(Fredricks, Blumenfeld, & Paris, 2004):

- **verhaltensbezogen**: z.B. Ausdauer, Konzentration, Aufmerksamkeit, Stellen von Fragen und Teilnahme an Diskussionen
- **kognitiv**: z.B. Selbstregulierung, Bewältigungsstrategien, Lernbereitschaft
- **emotional**: z.B. Freude an Aktivitäten, Zugehörigkeit, Frustration

Pilotstudien: Einfluss der folgenden drei Faktoren auf Engagement:

- **Art der (primären) Interaktion**
(verhaltensbezogen, kognitiv, emotional)

- **Video-Lehrinhalte**
(nur verhaltensbezogen)

Flexibilität der Abgabefristen für Hausaufgaben

- (nur verhaltensbezogen)

Explorative Studie

Within-Subject

16 ProbandInnen

Instrumente:

(Web)Survey

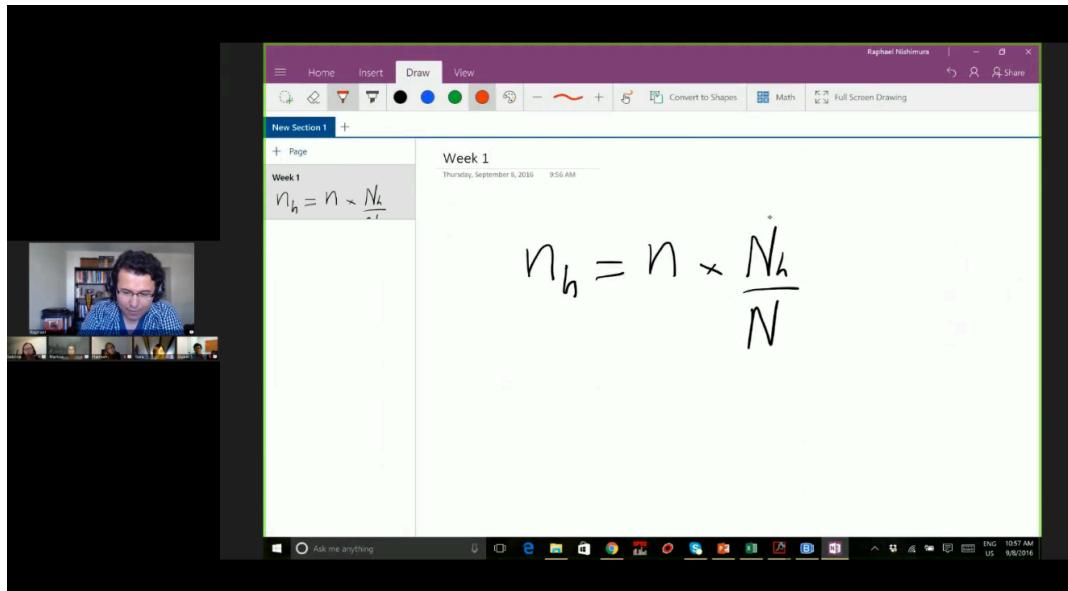
Learning Analytics

Administrative Daten

Qualitative Interviews

Studie 1: Art der Interaktion

Synchrone Interaktion



The screenshot shows a Zoom meeting interface. On the left, there is a video thumbnail of a participant. The main area is a whiteboard from the Microsoft OneNote application. The whiteboard has a title 'Week 1' and a date 'Thursday, September 8, 2016 9:56 AM'. A handwritten formula is visible:
$$n_h = n \times \frac{N_h}{N}$$

- verhindert soziale Isolation
- Fragen werden sofort beantwortet

Asynchrone Interaktion



Privacy of self-administered modes when doing q's in public
by [\[redacted\]](#) - Tuesday, 7 June 2016, 3:48 PM

I was wondering if self-administered questionnaires when done in public (public transport, at the park, ...) can still be considered highly private? I'd rather assume that filling out a questionnaire in public leads to a feeling of low privacy and external factors like sex or race of the people surrounding the respondent are likely to alter his response behaviour.

[Permalink](#) | [Edit](#) | [Delete](#) | [Reply](#)



Re: Privacy of self-administered modes when doing q's in public
by [\[redacted\]](#) - Sunday, 12 June 2016, 7:25 PM

Great point. I agree that if people feel that questions are sensitive, they may just decide not to do the survey at all. I think self-administering the survey using an iPad would help. The respondent wouldn't have to say the answer out loud and the interviewer couldn't see the answers provided when finished (compared to if they were given a paper/pencil survey.)

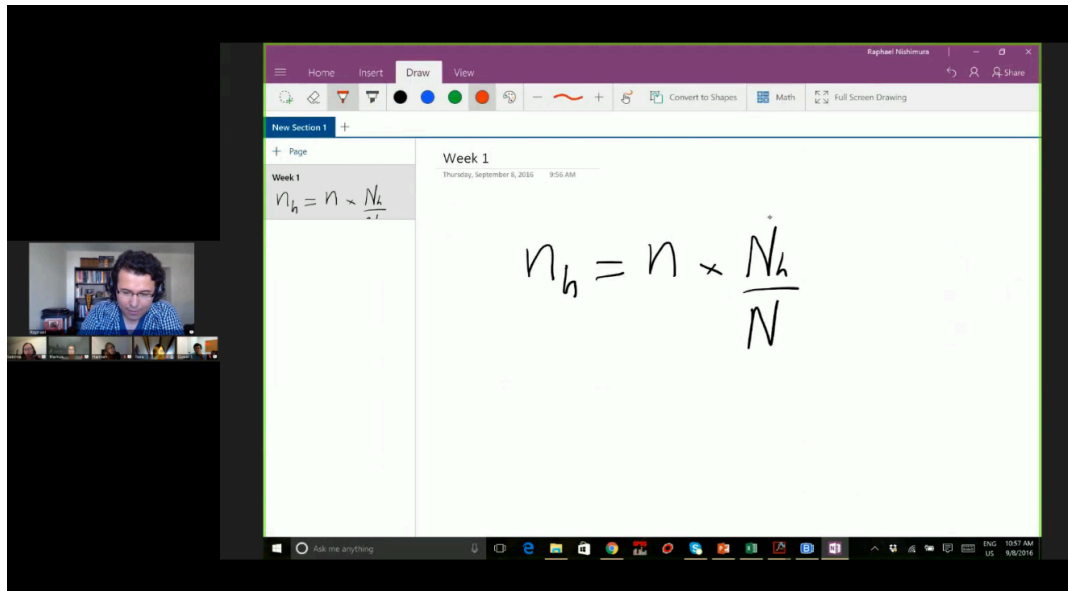
[Permalink](#) | [Show parent](#) | [Edit](#) | [Split](#) | [Delete](#) | [Reply](#)

- Flexibilität
- Mehr Zeit zum Nachdenken/Reflexion (Hrastinski & Keller, 2007, p. 66)

Studie 1: Art der Interaktion

13 ProbandInnen

K1: Feb-May, 2016



Videounterstützte **synchrone**
Sprechstunden
1 x pro Woche (ca. 50 Min.)

K2: Juni-August, 2016



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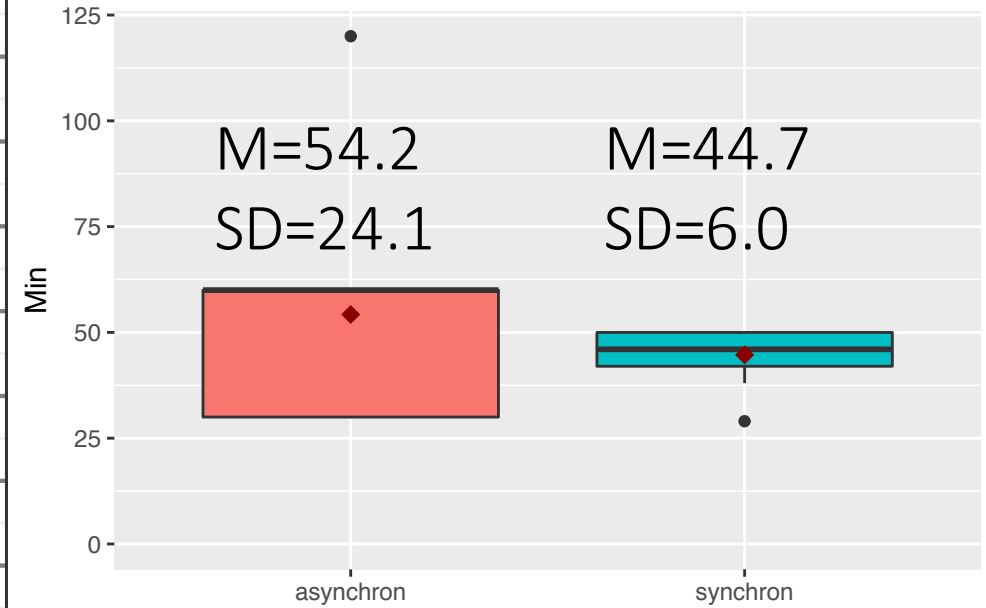
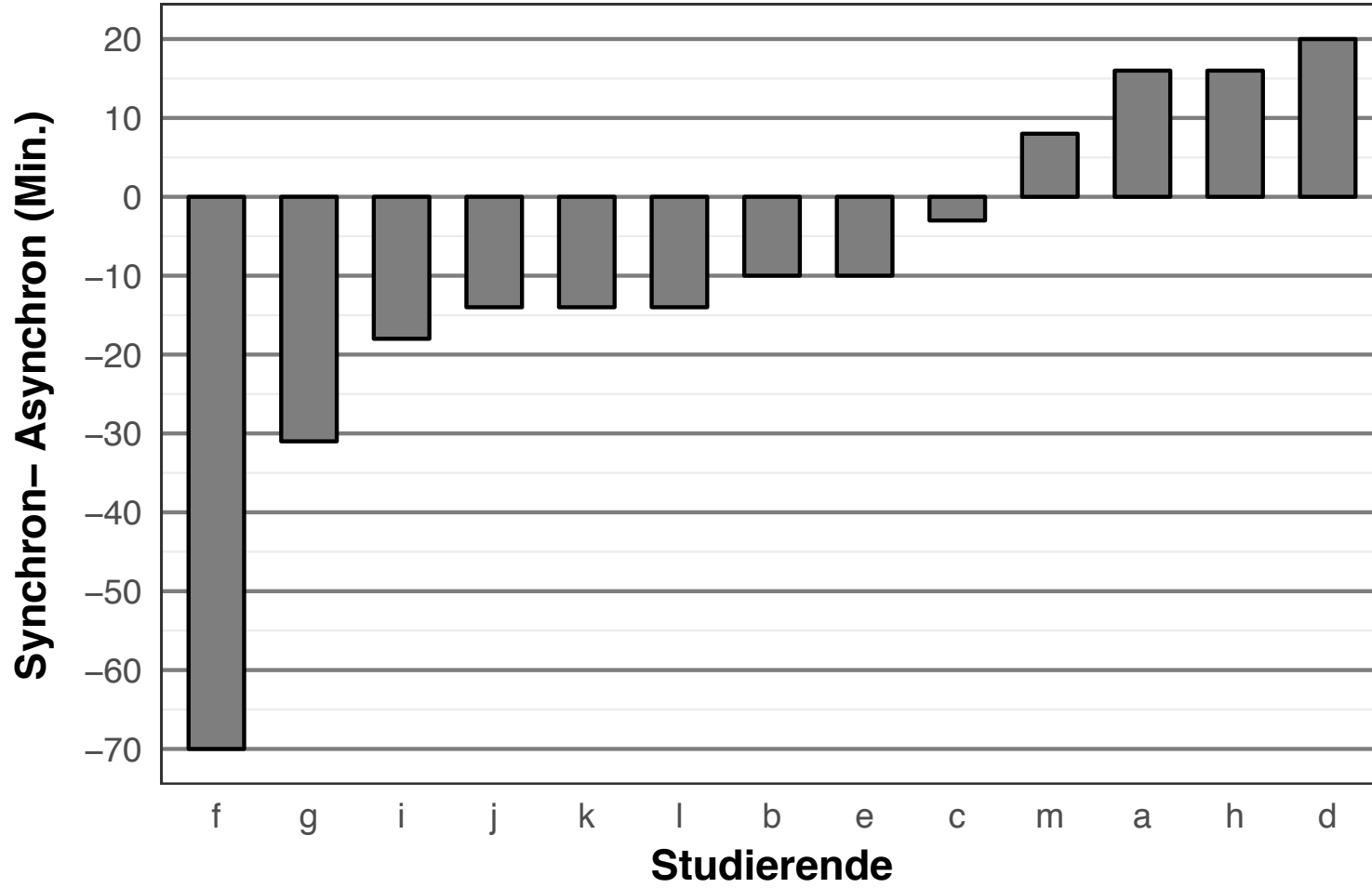
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Asynchrone Diskussionsforen
1 x pro Woche

Studie 1: Zeitaufwand (verhaltensbezogen)

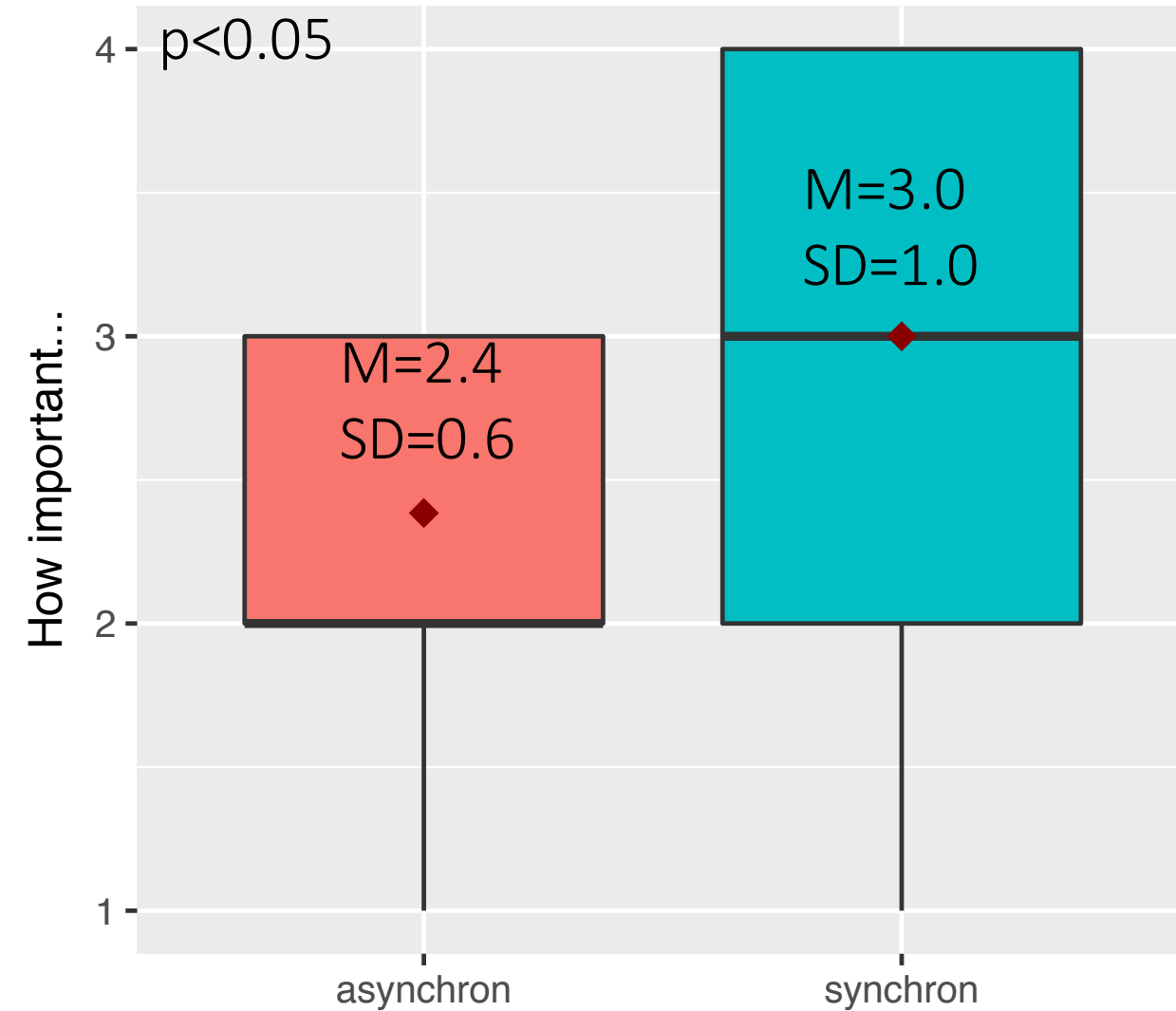
Individuelle Unterschiede



$p > 0.1$

Datenquelle: Post-Course Survey + Administrative Daten

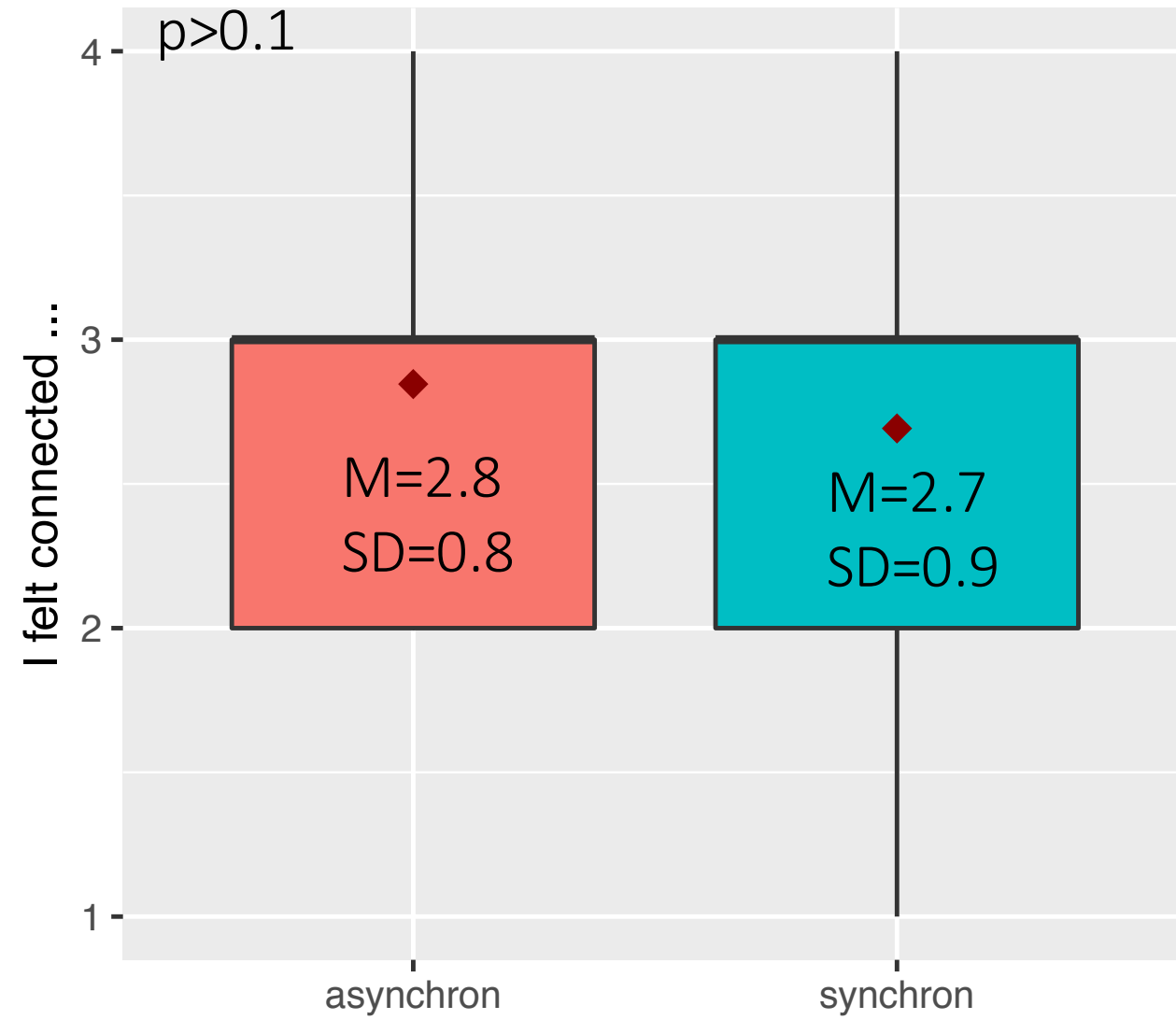
Studie 1: Bedeutung für Lernen (kognitiv)



How important were discussion forums (weekly discussion sessions) in helping you learn the material?

- 1-not at all important
- 2-a little important
- 3-somewhat important
- 4-very important

Studie 1: Soziale Distanz zwischen den ProbandInnen (emotional)



How true is each of the following statements about your experience with the discussion forums/weekly discussion sessions?

I felt connected to other students through the discussion forums (weekly discussion sessions)

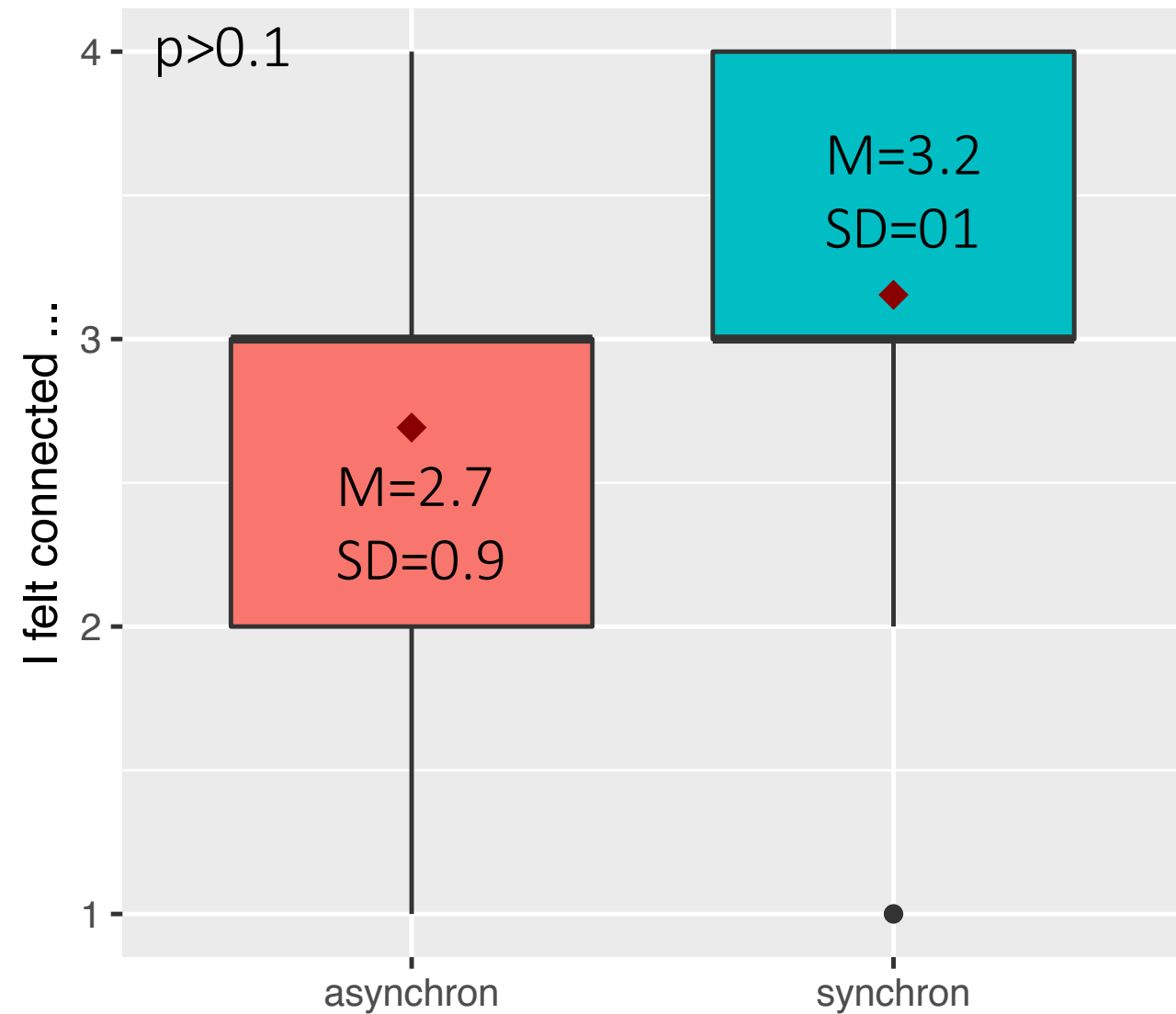
1-not true

2-slightly true

3-somewhat true

4-very true

Studie 1: Soziale Distanz zum Vortragenden (emotional)



How true is each of the following statements about your experience with the discussion forums/weekly discussion sessions?

I felt connected with the instructor through the discussion forums/weekly discussion sessions

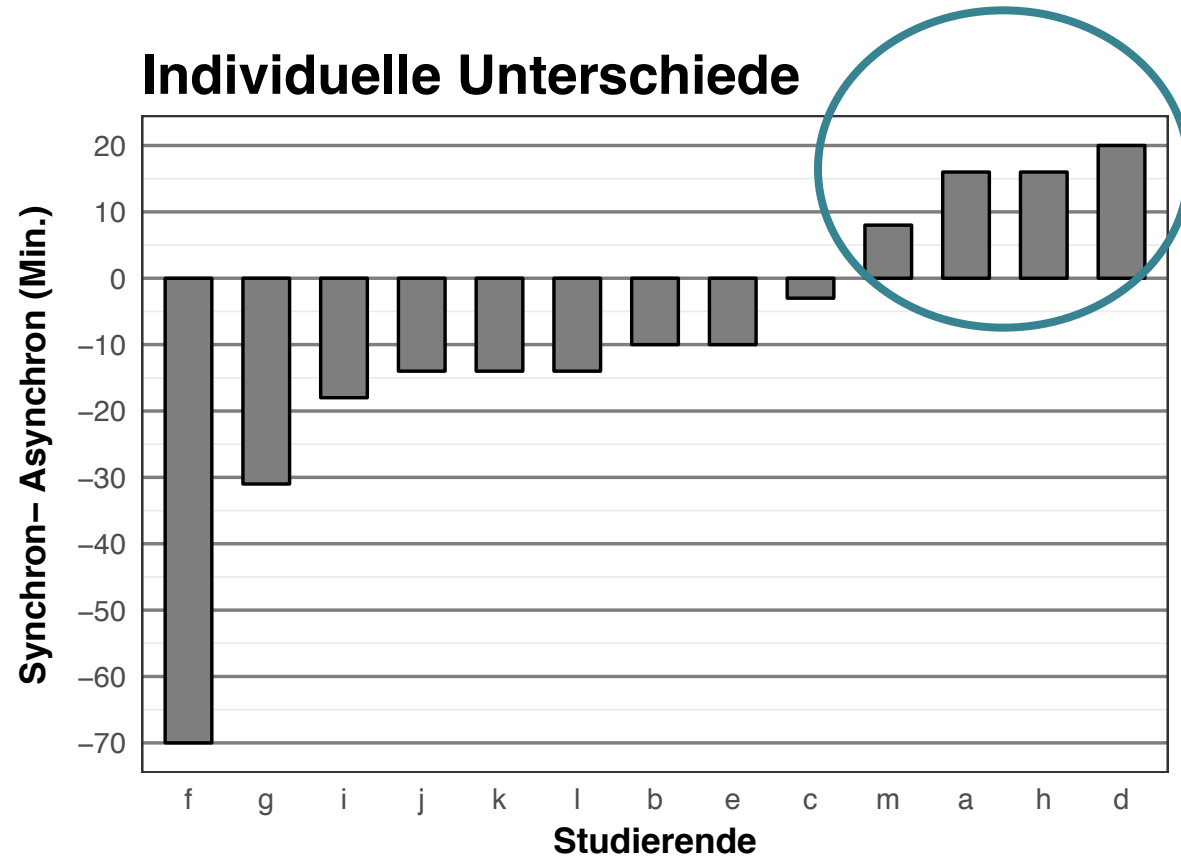
1-not true

2-slightly true

3-somewhat true

4-very true

Studie 1: Qualitative Interviews (n=12/online/semistrukturierte Leitfadeninterviews)



- 2 der 12 interviewten ProbandInnen wünschten sich Diskussionsforen als primäres Interaktionsmedium im nächsten Kurs
- Gründe: weniger Zeitaufwand und mehr Flexibilität

Studie 1: Qualitative Interviews (n=12/online/semistrukturierte Leitfadeninterviews)

Synchron	Asynchron
Trägt dazu bei, Gemeinschafts- und Zugehörigkeitsgefühl zu erzeugen (n=10)	Schwierig, Gemeinschaftgefühl aufrechtzuerhalten (n=10)
Einfacheres Zeitmanagement , weil Interaktion in bestimmtem wöchentlichen Zeitraum (n=3)	Zeitmanagement schwieriger, weil Aktivität im Forum über gesamte Woche verteilt (n=3)
Fragen können direkt gestellt werden (n=4)	Fragen werden zeitverzögert geantwortet (n=4)
	Zugegeben , dass nicht alle Fragen und Postings gelesen wurden (n=5)

Studie 1: Schlussfolgerungen

- Asynchroner Modus genauso zeitaufwändig wie synchroner aber mit geringerem kognitiven Engagement assoziiert
- Qualitative Interviews zeigen, dass asynchroner Modus mit geringerem emotionalen Engagement einhergeht (jenseits sozialer Distanz)
- Effektive und effiziente Kombinationen beider Modi (und jeweils optimierte Moderationsstrukturen) sollten weiter erforscht werden

Studie 2: Video-Lehrinhalte

Video-Vorlesungen



+ Experten-Interviews

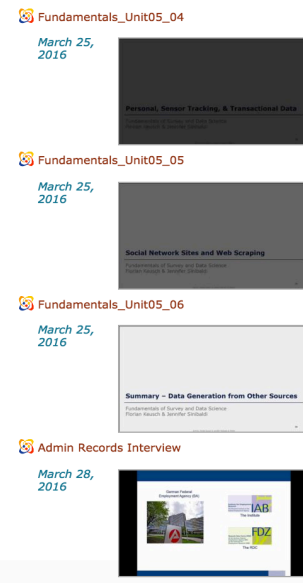


- Experten-Interviews betonen Nutzen der Lehrinhalte

(Renninger & List, 2012)

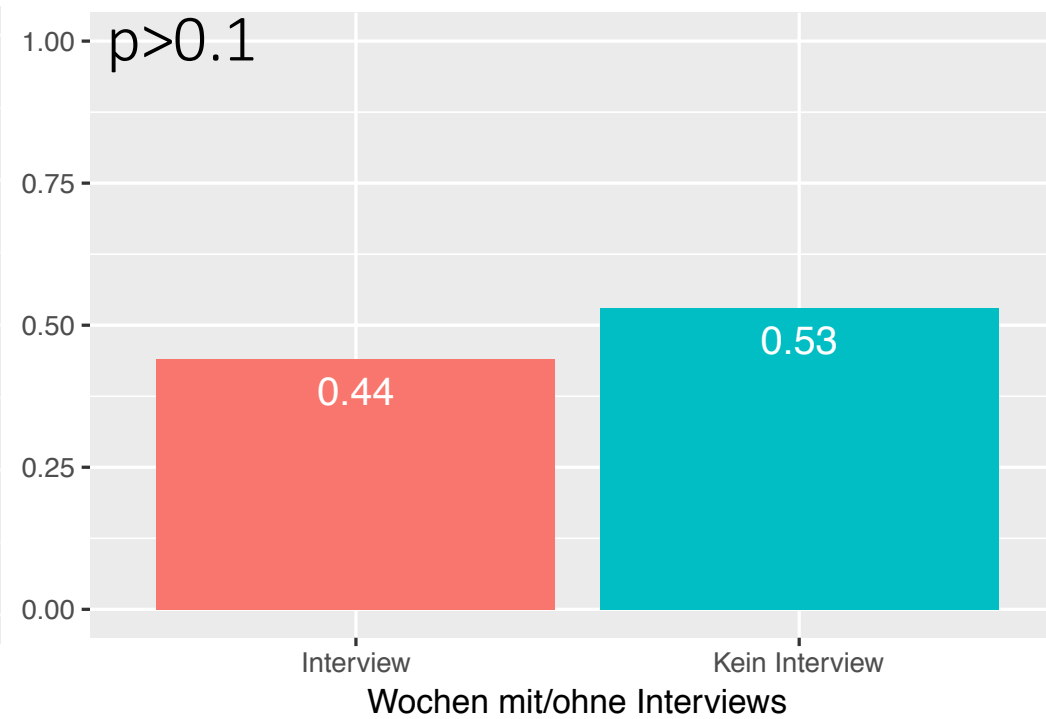
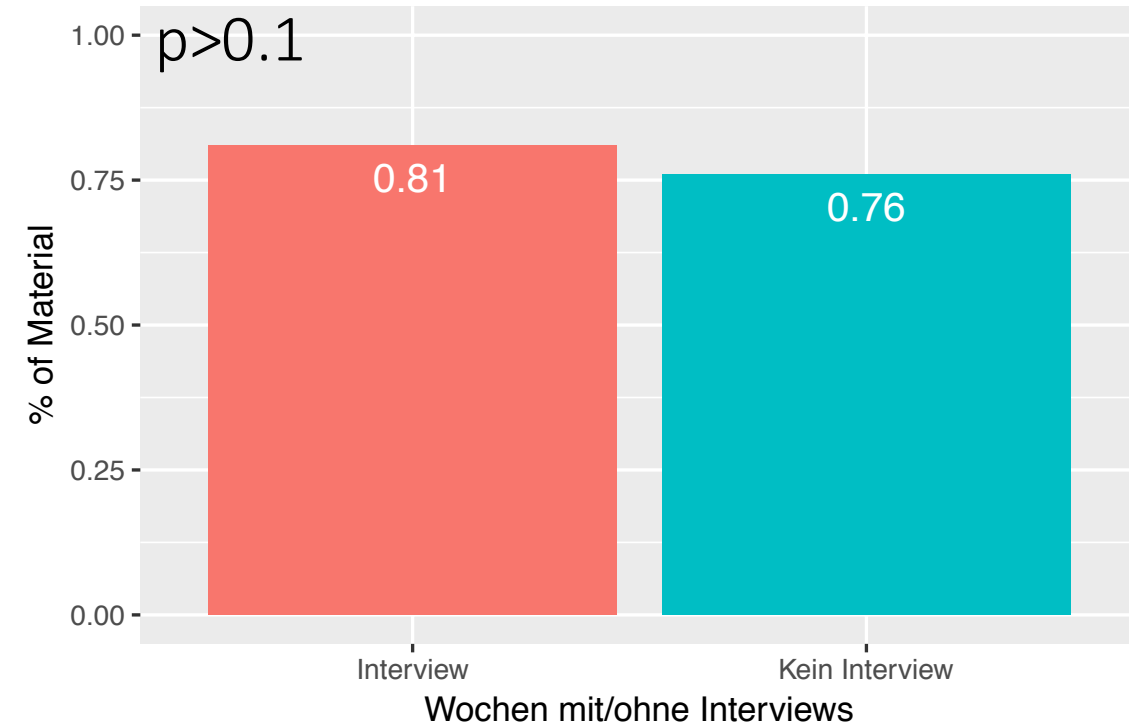
- Kurs: **12 Wochen** ab Feb. 2016
- Within-subject Design: 16 ProbandInnen
- Experten-Interviews in Wochen: **3, 4, 5, 8**

Studie 2: Selektionseffekt(verhaltensbezogen)



1. Videos: % von angesehenem Material

Letzte Videos: % von angesehenem Material



Studie 2: Selektionseffekt (verhaltensbezogen)

- 6 von 16 Studierenden haben min. 50% des Interview-Videomaterials angesehen
- 5 davon haben min. 50% letzter Videos in anderen Units gesehen

Studie 2: Selektionseffekt (verhaltensbezogen)

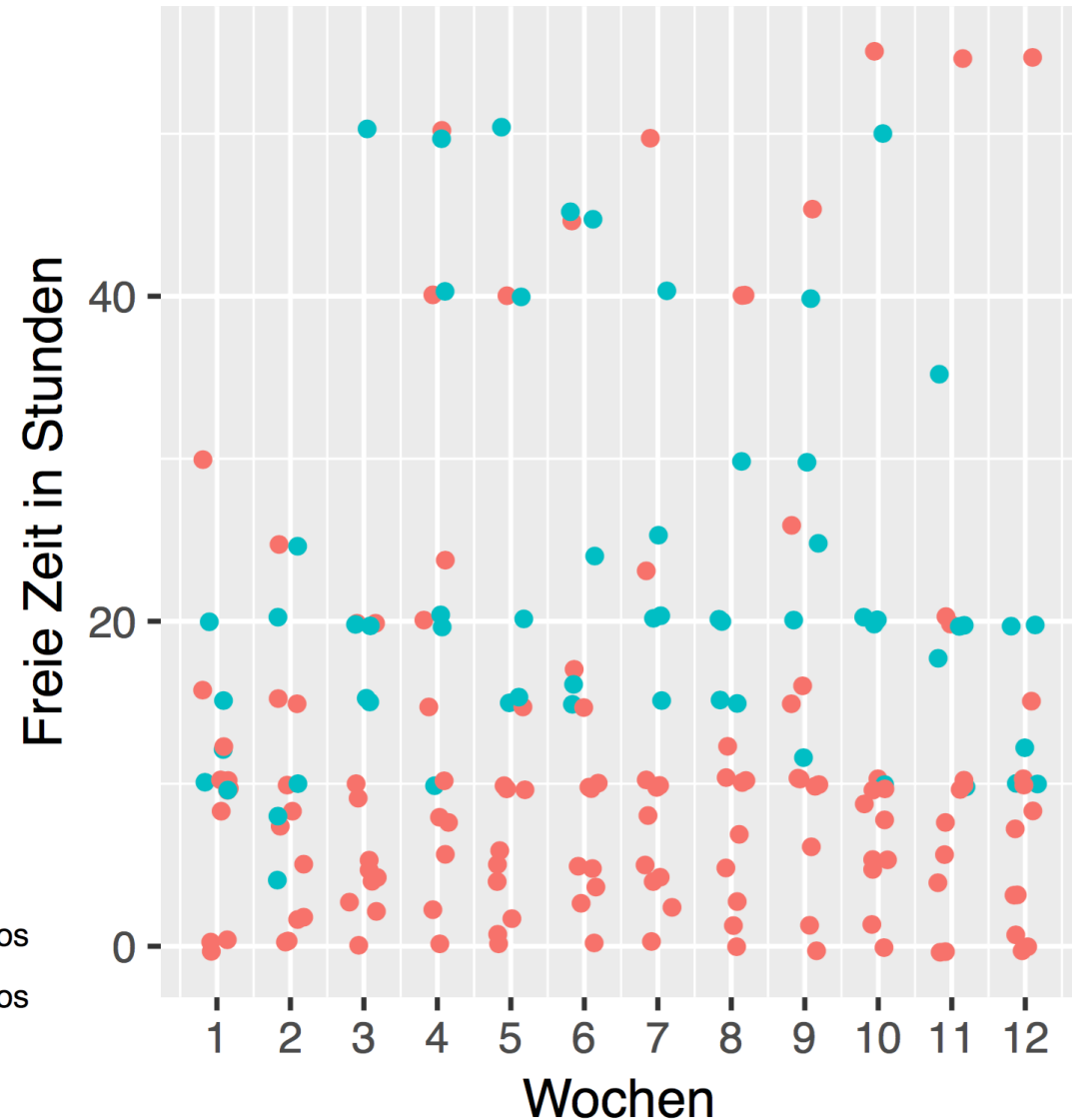
Datenquelle: LA

- Studierende, die weniger als 50 % aller letzten Videos gesehen haben, haben weniger Freizeit:
- $M(<50\%) = 11.2\text{h/W}$
- $M(>50\%) = 22.0\text{h/W}$
- $r(\text{Freie Zeit, \% der letzten Videos gesehen}) = 0.51$, $p = 0.07$, $n = 13$

Gruppe

- <50% der letzten Videos
- >50% der letzten Videos

Unterschied zw 2 Gruppen



Studie 2: Schlussfolgerungen

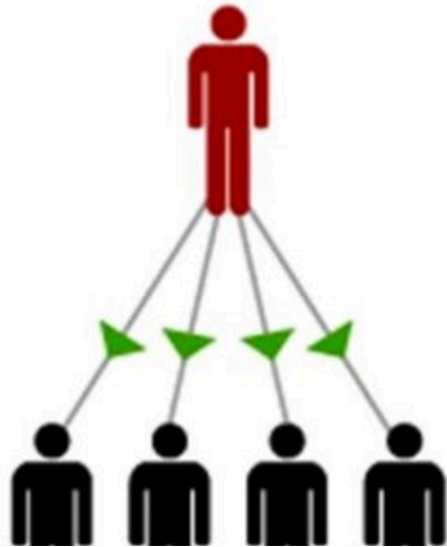
- Platzierung des Materials ist wichtig
- Bereits bei der Einführung von Interventionen für mehr Engagement, sollten wir über **Workload** nachdenken

Studie 3: Flexibilität der Abgabefristen für Hausaufgaben

Instructor-Paced Format:

11 Wochen

Friste für alle Hausaufgaben

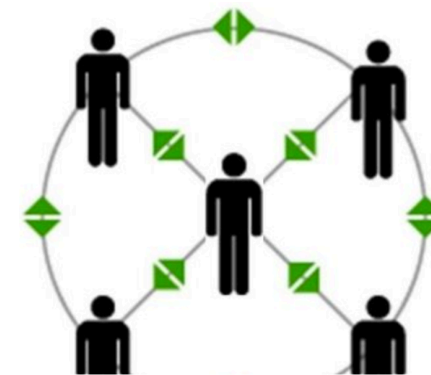


- 8 Probanden

- Interaktion: Asynchrone Diskussionsforen

Self-Paced Format:

8 Wochen, Keine Fristen (alle Hausaufgaben mussten bis Ende des Kurses abgegeben werde)



Studie 3: Flexibilität der Abgabefristen für Hausaufgaben

Instructor-Paced Format:

- Keine Drop-outs
- Qualitativen Interviews: 5 erwähnten Schwierigkeiten bei der Einhaltung von Fristen

Self-Paced Format:

- Nur 4 der angemeldeten 8 haben Kurs beendet
- Nur 1 von 4 folgte vorgeschlagenem Zeitplan, die anderen 3 beendeten den Kurs während der letzten 2 Wochen
- Qualitativen Interviews: alle 8 Studierende betonen Zeitmangement als primäre Herausforderung für Kursabschluss

Studie 3: Schlussfolgerungen & Grenzen



“As we start a new school year, Mr. Smith, I just want you to know that I’m an Auditory Learner and trust that you’ll conduct yourself accordingly.”

- Self-paced format benötigt gutes Zeitmanagement
- Herausforderung: Grad der Flexibilität

Allgemeine Schlussfolgerungen & Grenzen

- In allen Studien unterschiedliche Subgruppen: mehr Fokus auf das Verständnis von Unterschieden
- Workloadmanagement muss als zentrale Priorität für Engagement-Interventionen gesehen werden
- Kleines n der Studie: Pilotstudien ermöglichen Einschätzung zur Planung experimenteller Studien
- Mögliche Drittvariablen: Zeit (asynchroner Kurs während des Sommers); Kurse von 2 verschiedenen Dozenten unterrichtet

Literatur

Finn, J. D., & Zimmer, K. S. (2012). Student engagement: What is it? Why does it matter? In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 97–131). New York, NY: Springer.

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