



Universität  
Münster



INSTITUT FÜR PSYCHOLOGIE  
IN BILDUNG UND ERZIEHUNG

# Using Peer-Review to Foster the Development of Scientific Competence in Psychology Students

Jun. Prof. Julia Kerner auch Koerner

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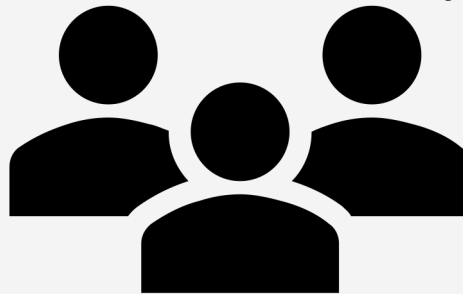


## Scientific Competence in Psychology Students

*"I've explained a thousand times how a hypothesis should be formulated!"*

*"And now take a look at this bibliography!"*

*"Why is this still a problem in the bachelor or even master-thesis?"*



- Scientific Competence: **The ability to think and work scientifically and to conduct empirical research.**

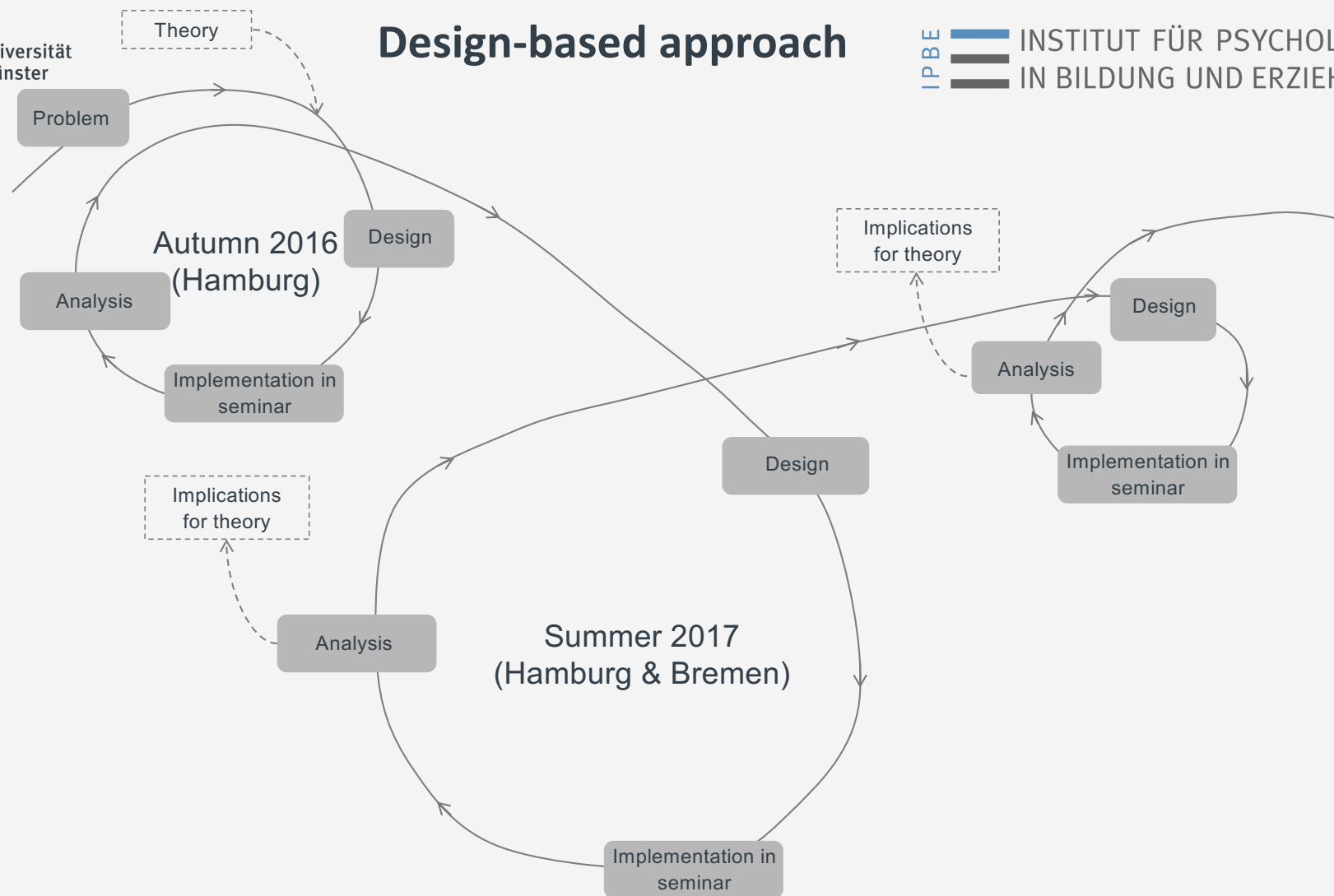
## Why Peer Review?

- Peer review is „an arrangement in which individuals consider the amount, level, value, worth, quality or success of the products or outcomes of learning of peers of similar status.“ (Topping 1998, p. 250, cited in Gielen, Dochy & Onghena, 2011).
- In higher education: Students read the work of other students and provide feedback (Gielen et al., 2011).
- Could this change of perspective improve the scientific competence in psychology students?

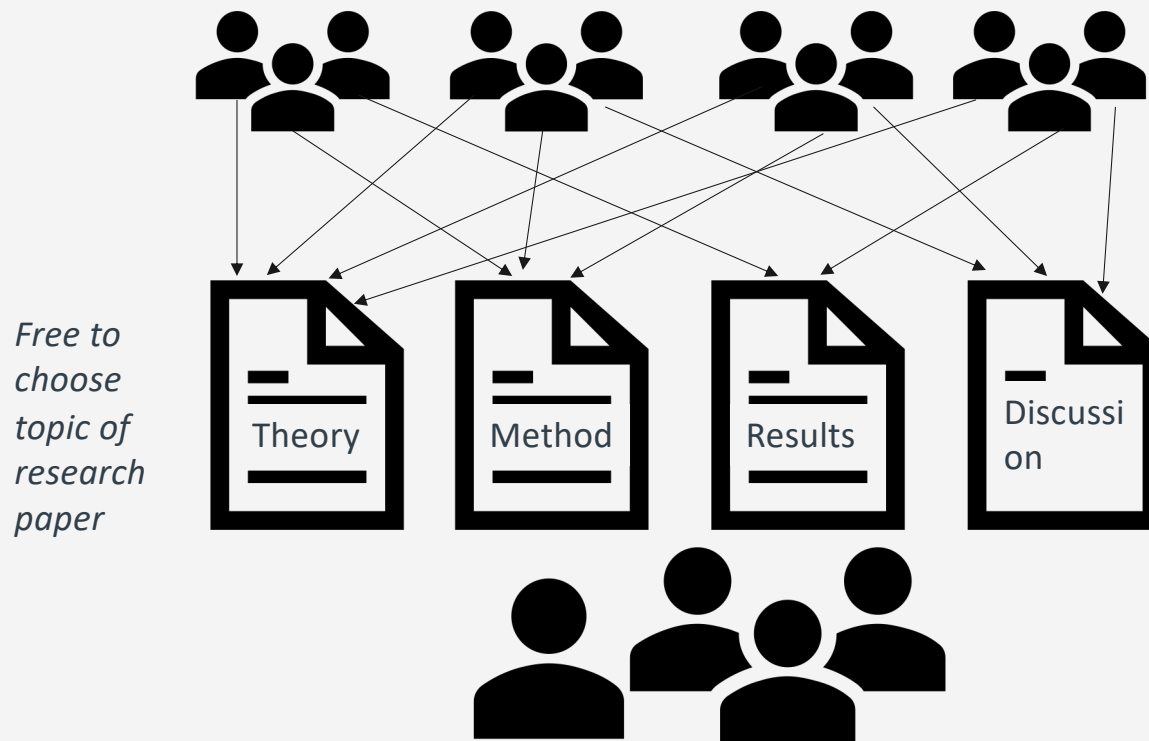
## Aim

- **Aim:** Develop a didactic setting that uses peer review to foster the development of scientific competence in psychology students
- **Research question:** Which aspects of the didactic setting can be identified that foster and or hinder the development of scientific competence in psychology students?

# Design-based approach



## Methods: How does the peer review work?



### Peer Review criteria

Criterion (EN)	Level	Description (EN)
General		The grade does not result from the arithmetic mean
Criteria: Literature	1	The literature leads to the research question, hypotheses, and design
	2	Theoretical background fits with the study's content
	3	Theoretical background is somewhat related to the study
	4	Hardly any theoretical background or inappropriate
Precision	1	Every sub-argument is supported by the best possible source
	2	Every major statement is supported by a suitable source
	3	Each section uses 1–3 sources, sub-arguments are not individually referenced
	4	There are key statements without references
Scope	1	Five or more sources per page in the theory section
	2	Three or more sources per page in the theory section
	3	About 1.5 or more sources per page in the theory section
	4	Fewer than one source per page in the theory section
Appropriateness	1	Literature is current, international, and includes sources unknown to the supervisor
	2	Literature is current and international, and includes the relevant works for the topic
	3	Literature is current but either mostly German OR some relevant works are missing
	4	Literature is outdated and important works are missing
Formal	1	No formal errors
	2	Two or three small errors
	3	One major or many small errors
	4	Overall very poor form
Criteria: Hypotheses and	1	Research question is formulated clearly, precisely, and is researchable
	2	Research question is mostly clear, only minor ambiguities
	3	Research question is somewhat vague or too broad
	4	Research question is unclear or missing
Hypotheses	1	Hypotheses are precise, logically derived from theory, and testable
	2	Hypotheses are mostly precise and theory-based, minor weaknesses
	3	Hypotheses are vague, only partly derived from theory, or difficult to test
	4	Hypotheses are missing, unclear, or not testable

Done during the seminar!

02.09.25

## Methods: Comparison of seminars

	Research colloq 1 Hamburg	Research colloq 2 Hamburg	Seminar personality Hamburg	Research colloquia Bremen
Semester	Autumn 2016	Summer 2017	Summer 2017	Summer 2017
Lecturer	JKK	AB	JKK	TR
Number of students	10	16	27	65 in 4 seminars
Attendance	Optional	Mandatory	Optional	Mandatory

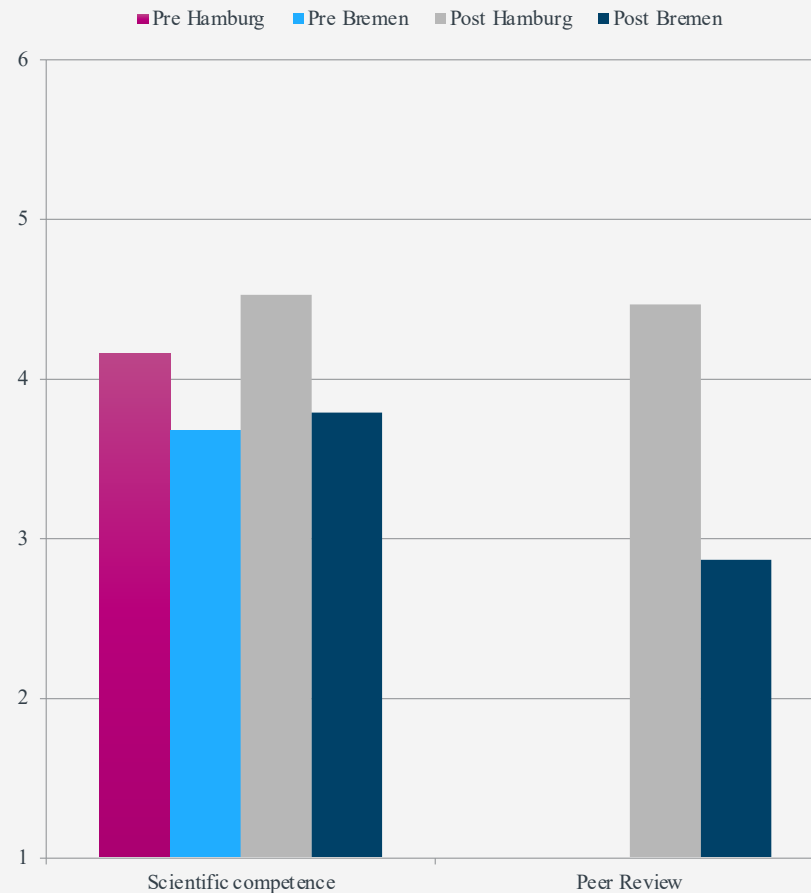
## Results: Factors for successful peer review

	Research colloq 1 Hamburg (2016)	Research colloq 2 Hamburg	Seminar Personality Hamburg	Research colloquia Bremen	Result of comparison
Constructive alignment	Yes	No	Yes	No	Constructive alignment is necessary (same scale for review and grading)
Blind review	Blind	Not blind	Blind	Blind	Blind review works better
Number of reviews	2	0 to 16	5-6	3-6	Min. of 2, up to 5 reviews
Format of review	29 criteria, scale 1-5	Unstructured oral feedback	29 criteria, scale 1-5	52 criteria, checklist yes/no	Scale with fields for comments in case of poor assessment
Optional or not	Optional	Optional	Mandatory	Mandatory	Should be mandatory or only high performing students participate
Feedback of lecturer	Yes	Yes	Yes	No (tutoring did not work)	Most important factor!



## Results: Quantitative analyses

- Students report a higher scientific competence after peer review,  $F = 8,74$ ,  $p = .005$ ,  $\text{Eta}^2 = .179$
- Students in Hamburg report a higher scientific competence compared to students in Bremen
- Students in Hamburg evaluated the peer review more positive,  $t = 6.03$ ,  $p > .001$



## Results evaluation

### 4. Offene Fragen

#### Was ist besonders gut an der Veranstaltung und sollte unbedingt beibehalten werden?

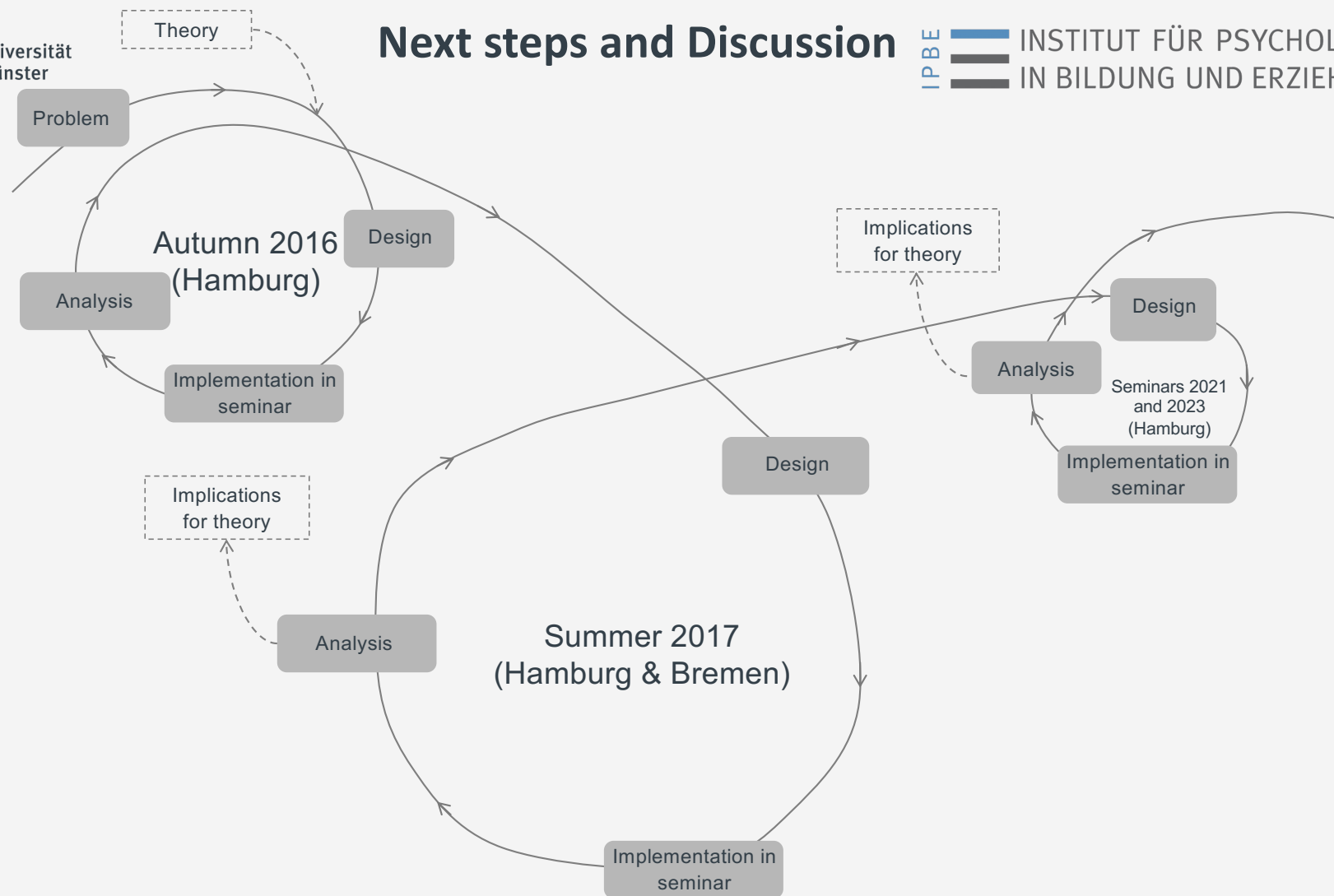
- - Kurzer Input während der Seminarzeit, dann Aufgabenbearbeitung zu dem Input → direkte Anwendung
  - Peer-Review
  - der Versuch mögliche Probleme/Hindernisse zwischen den Veranstaltungen zu verbessern (1. Review zu wenig Zeit, 2. Review: Mehr Seminarzeit angesetzt)
- Anleitung zu den einzelnen Schritten, man hat sich immer gut betreut gefühlt
- Das Peer Review Verfahren hat mir gefallen. Auch die Aufteilung in Kleingruppen war angenehm, da dadurch die individuelle Arbeitsbelastung nicht zu hoch war.
- Die Betreuung! Die Lehrperson war stetig für Fragen ansprechbar und beantwortete diese zeitig. Außerdem wurde zu jedem Zeitpunkt klar kommuniziert, wann welcher Arbeitsschritt beendet werden sollte und wie man was wo hochladen/hinschicken sollte.  
  
Dass das Peer Review in zwei Teile aufgeteilt wurde, sodass man nicht ein gesamtes Shortpaper auf einmal lesen musste sondern es etwas entzerrt war.
- Die Strukturierung in Abschnitte mit jeweiligen Reviewschleifen  
Die gegenseitigen Reviews  
Die freie Arbeit (Hypothesengenerierung etc)
- Feedback der Seminarleiterin sehr gut, sehr hilfreich, sehr kompetent
- Glasklare Gliederung und spannendes Konzept, wenn mich das Thema auch nicht so interessiert hat. Das ist aber mein eigenes Problem und spricht weder gegen die Dozentin noch das Seminar.
- Ich finde es super, dass wir während der Einheiten immer weiter an unserer Seminarleistung weiterarbeiten konnten und es sich nach und nach aufgebaut hat. Zusätzlich gab es Infomaterial/ Inhaltsvorträge zu Beginn der Einheiten, die das Seminar weiter angereichert haben.
- Klare Struktur, Abgabetermine gut übersichtlich dargestellt, Peer-Review Verfahren und Feedback zur Ausarbeitung nach einzelnen Arbeitsschritten ist sehr hilfreich.
- Mir hat die Struktur der Veranstaltung besonders gut gefallen. Die Dozentin hat die Anforderungen immer klar formuliert und es wurde sehr fair und respektvoll miteinander umgegangen. Die Atmosphäre war super und man hatte zu keinem Zeitpunkt das Gefühl, etwas nicht zu schaffen, da wir von der Dozentin Schritt für Schritt durchgeführt wurden!
- Peer-Reviews

## Summary of results

Factors that are relevant for successful peer-review:

- If possible: review criteria are also used for grading
- Feedback from the lecturer(s) on the reviews
- Scale for assessment with fields for comments in case of poor assessment
- Blind review
- Each piece of work should receive two to six individual reviews
- Mandatory with at least two submission dates (these can be self-selected and asynchronous)

## Next steps and Discussion



**Thank you!**

Please contact me for any further questions: [j.kenerauchkoerner@uni-muenster.de](mailto:j.kenerauchkoerner@uni-muenster.de)