



UNIVERSITÄTSMEDIZIN GÖTTINGEN **UMG** 

Assessments in higher education: insights from medical education

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Presentation outline

- Context: undergraduate medical education
- Assessment formats
- Assessment consequences
- Test-enhanced learning

Undergraduate medical education in Germany

- Two types of medical curricula in Germany
 - ‚traditional curriculum‘
 - ‚model curriculum‘
- 6 years in total; final year: electives
- High stakes examinations:
 - MCQ exams after year 2 (traditional only) and 5
 - Vivas after year 2 (traditional only) and 6

High-stakes examinations in medicine

In Germany, MCQs and vivas are the mainstay of high-stakes examinations in traditional medical curricula.

“In-house” assessments

- MCQs
- Type X questions
 - PickN questions
- Key Feature questions
- Short answer questions
 - Short essays
 - OSCEs

Type X and PickN

- ‘recognition tests’
- A recent analysis of questions used in one clinical curriculum showed that item quality may be suboptimal.
- Scoring is difficult as a huge number of different scoring algorithms is available, yielding anything from an A to a D grade for the same set of answers provided by the same set of students.
- Reliability & validity?

Key features

- Coming up with a diagnosis or suggesting an adequate treatment for a given condition is a **complex cognitive skill**.
- This skill cannot be assessed by means of multiple choice questions.
- Diagnostic and therapeutic decisions represent key features of patient management.
- **Key feature questions** can be used to assess students' abilities to take those decisions.

Page & Bordage, Acad Med 1995; 70: 104-110
Hrynchak et al. Med Educ 2014; 48: 870-883

Definitions

- **Summative assessments** are graded; students can pass or fail them. In medicine, they allow an overall judgment about competence, fitness to practice, or qualification for advancement to higher levels of responsibility.
- **Formative assessments** are usually not graded, and students cannot fail them. One of their functions is to provide students with feedback in order for them to identify potential areas of improvement. -

Epstein, NEJM 2007; 356: 387-396

To teach or to assess...

Raupach et al. BMC Medicine 2013, 11:61
<http://www.biomedcentral.com/1741-7015/11/61>



RESEARCH ARTICLE

Open Access

Summative assessments are more powerful drivers of student learning than resource intensive teaching formats

Tobias Raupach^{1,2*}, Jamie Brown², Sven Anders³, Gerd Hasenfuss¹ and Sigrid Harendza⁴

To teach or to assess...

- Using a 2x3 design, we demonstrated that teaching intensity had a much weaker effect than exam consequences on student learning behaviour.
- In a logistic analysis adjusted for various potential confounders, exam consequences were the only predictors of student performance.

Testing Effect

- While summative assessments impact on learning *behaviour*, exams might also have the potential to enhance learning *processes*.
- According to the **retrieval hypothesis**, the act of retrieving information from memory changes the mnemonic representation underlying retrieval – and enhances later retention of the tested information.
- This phenomenon is also known as the 'direct testing effect'.

Roediger & Karpicke, Perspect Psychol Sci 2006; 1: 181-210

Testing Effect

Test-enhanced learning of clinical reasoning: a crossover randomised trial

Tobias Raupach,^{1,2} Jil C. Andresen,¹ Katharina Meyer,¹ Lisa Strobel,¹ Michael Koziolek,³ Wolfram Jung,⁴ Jamie Brown² & Sven Anders³

- In this prospective, randomised cross-over trial, repeated testing compared to repeated study resulted in superior performance regarding clinical reasoning.
- Results were stable over a period of 6 months.

Raupach et al. Med Educ 2016; 50: 711-720

Summary

- Assessments are major drivers of student learning.
- Care must be taken to ensure alignment between learning objectives, instructional formats and assessment tools.
- Questions in summative exams must be of high quality; scoring algorithms need to be valid and fair.
- Formative exams enhance student learning.
- In a test-enhanced learning paradigm, case-based production tests should be used to foster higher-order cognitive skills.

Contact

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