Digitales Lehren, Lernen und Prüfen

Wie gelingt die Aktivierung von Studierenden?

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CLS Center für Lehr- und Lernservices | RWTH AACHEN UNIVERSITY

Es kam die Pandemie

Alles anders im Digitalen Semester?

Holger | NoneOfYourBusiness | Eike | DERBESTRAFER | Mike Ebert | Maschi69

Ellen Ripley | Alexander K | Janine Piroh | Alter Verwalter | Chr. Todorf | GriGri | Christoph Kues

Maxi Musterfrau | Sugarfree | #Zoombomber | Mikkel | Elke Müller | Karl Kaussen | Peter Petrelli

Ronald McDonald | Sophie Mendez | Sarah Schott | Schulterschmerz | Rainer Wahn | Ralph Kroggel | Andreeeeee

Hamburger | AlemanniaFangirl | Michi Beck | Don T | Elli Dunker | Zarah Q. | Kai Birne

BVB09 | Marc Schütt | Hubertine Frantz | TiktokJunkie | Sebi Muller | Nicht Da

Quelle: https://www.bcp.fu-berlin.de/chemie/chemie/forschung/InorgChem/agabram/Lehre/index.html

Online-Phase
Eigenstudium

Blended Learning
Wirksamkeit

Präsenzformate
im Blended Learning

Lehrende
Ansichten und Effekte

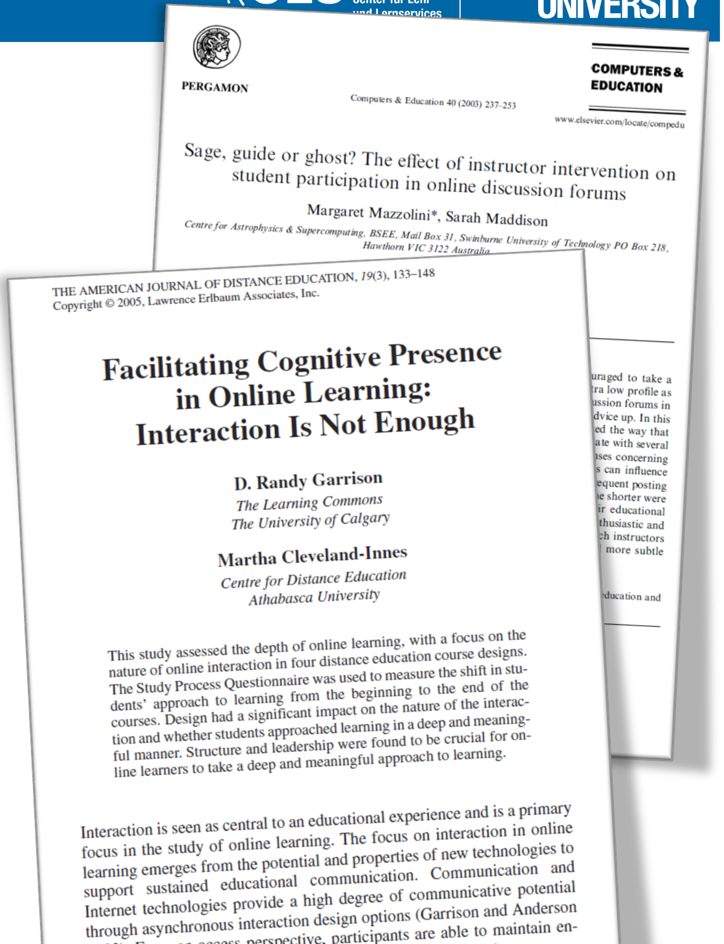
(Online-)Lehre

Effektivität erhöhen

Interventionen durch Instruktoren wirken praktisch nicht.

Die Lernmaterialien müssen eine aktive Verarbeitung inhärent fördern.

Aktivität erhöhen



PERGAMON
Computers & Education 40 (2003) 237–253
COMPUTERS & EDUCATION
www.elsevier.com/locate/compedu

Sage, guide or ghost? The effect of instructor intervention on student participation in online discussion forums

Margaret Mazzolini*, Sarah Maddison

Centre for Astrophysics & Supercomputing, BSEE, Mail Box 31, Swinburne University of Technology PO Box 218, Hawthorn VIC 3122 Australia

THE AMERICAN JOURNAL OF DISTANCE EDUCATION, 19(3), 133–148
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Facilitating Cognitive Presence in Online Learning: Interaction Is Not Enough

D. Randy Garrison
The Learning Commons
The University of Calgary

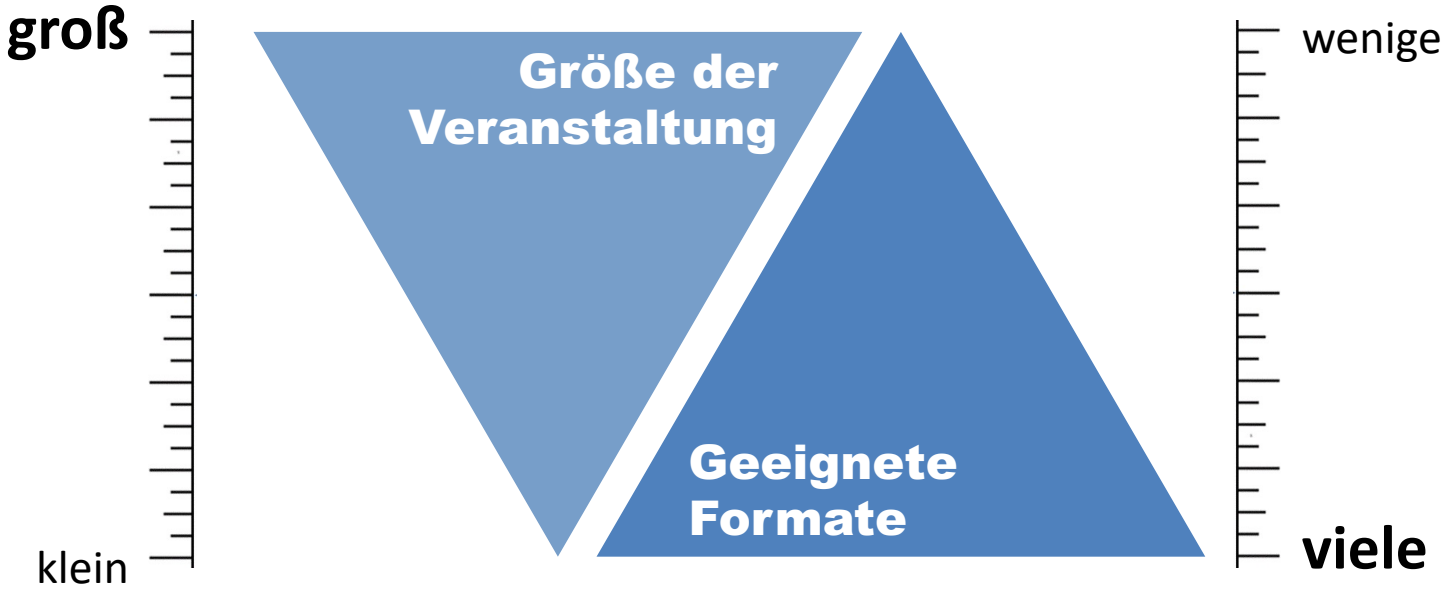
Martha Cleveland-Innes
Centre for Distance Education
Athabasca University

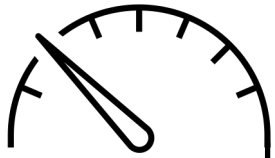
This study assessed the depth of online learning, with a focus on the nature of online interaction in four distance education course designs. The Study Process Questionnaire was used to measure the shift in students' approach to learning from the beginning to the end of the courses. Design had a significant impact on the nature of the interaction and whether students approached learning in a deep and meaningful manner. Structure and leadership were found to be crucial for online learners to take a deep and meaningful approach to learning.

Interaction is seen as central to an educational experience and is a primary focus in the study of online learning. The focus on interaction in online learning emerges from the potential and properties of new technologies to support sustained educational communication. Communication and Internet technologies provide a high degree of communicative potential through asynchronous interaction design options (Garrison and Anderson ... perspective, participants are able to maintain en-

Skalierbarkeit

Das Grundproblem von Formaten für die Aktivierung



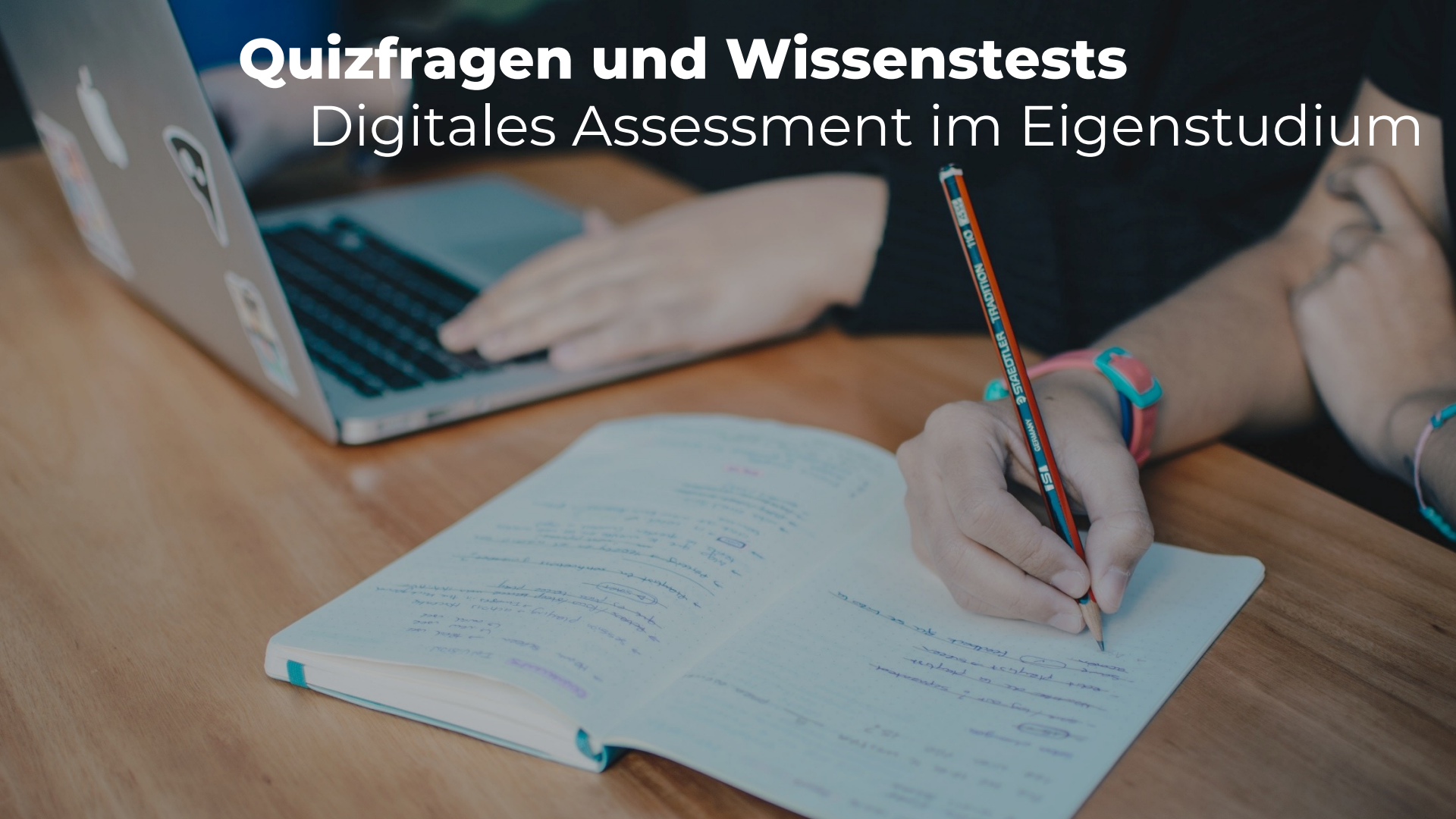


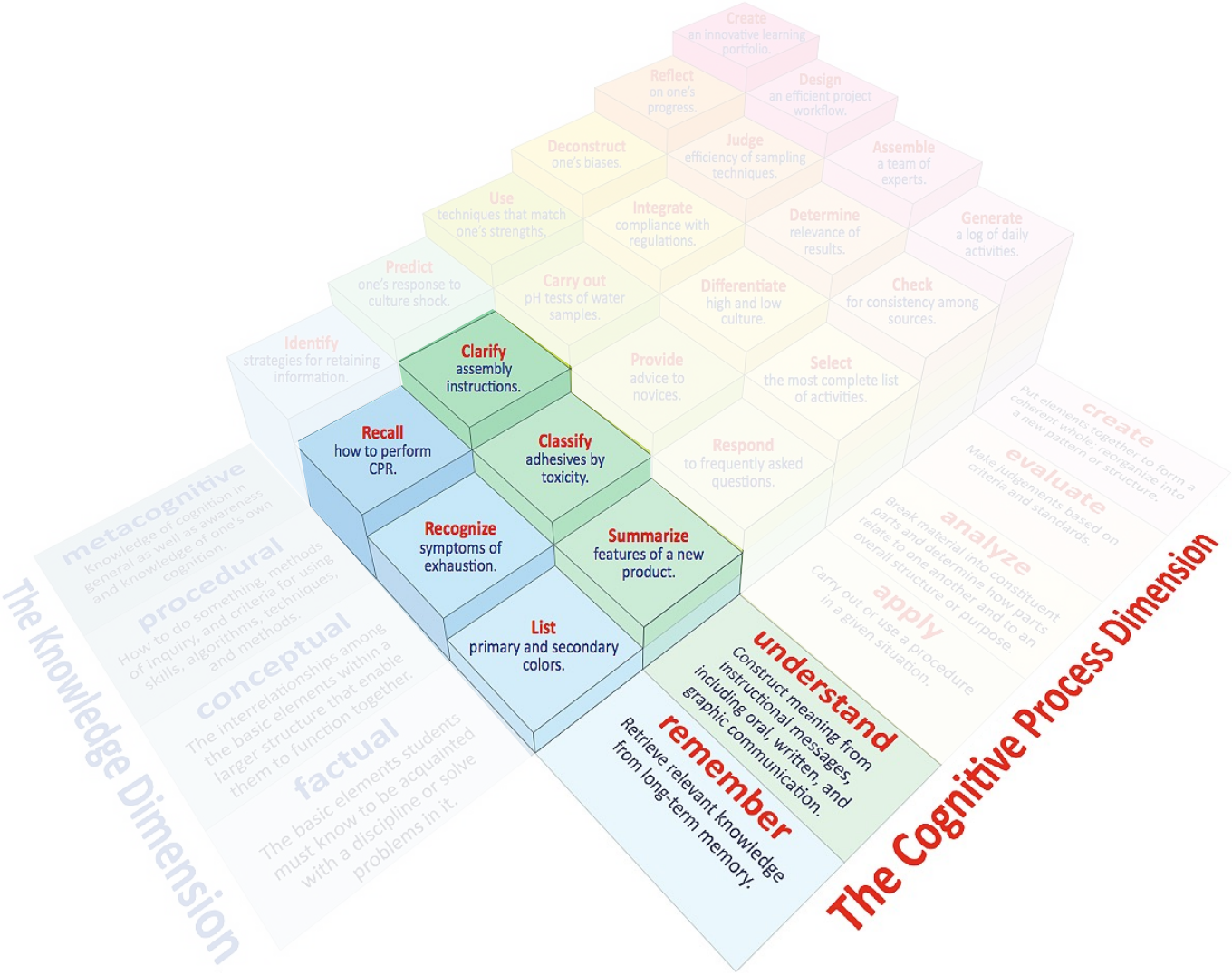
Hochschuldidaktik-Dilemma

- **Ambivalente empirische Evidenz**
- **Hohe Aufwände bei der Einführung**
- **Große Schmerzen beim Zurückrollen**

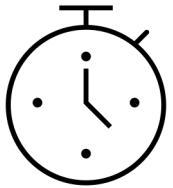
Quizfragen und Wissenstests

Digitales Assessment im Eigenstudium




The Knowledge Dimension
metacognitive
Knowledge of cognition in general as well as awareness and knowledge of one's own cognition.
procedural
How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods.
conceptual
The interrelationships among the basic elements within a larger structure that enable them to function together.
factual
The basic elements students must know to be acquainted with a discipline or solve problems in it.
The Cognitive Process Dimension
remember
Retrieve relevant knowledge from long-term memory.
understand
Construct meaning from instructional messages, including oral, written, and graphic communication.
apply
Carry out or use a procedure in a given situation.
analyze
Break material into constituent parts and determine how parts relate to one another and to an overall structure or purpose.
evaluate
Make judgements based on criteria and standards.
create
Put elements together to form a coherent whole; reorganize into a new pattern or structure.
Recall
how to perform CPR.
Clarify
assembly instructions.
Classify
adhesives by toxicity.
Recognize
symptoms of exhaustion.
Summarize
features of a new product.
List
primary and secondary colors.
Identify
strategies for retaining information.
Predict
one's response to culture shock.
Carry out
pH tests of water samples.
Differentiate
high and low culture.
Check
for consistency among sources.
Use
techniques that match one's strengths.
Integrate
compliance with regulations.
Determine
relevance of results.
Generate
a log of daily activities.
Deconstruct
one's biases.
Judge
efficiency of sampling techniques.
Assemble
a team of experts.
Reflect
on one's progress.
Design
an efficient project workflow.
Create
an innovative learning portfolio.
Provide
advice to novices.
Select
the most complete list of activities.
Respond
to frequently asked questions.

„Sie haben 15 Minuten, um den folgenden Text zu studieren. Anschließend werden Sie einen Wissenstest über diesen Text absolvieren.“



„Wir räumen Ihnen noch einmal 15 Minuten für das weitere Studium des Textes ein. Alternativ können Sie ein Quiz über den Text ausfüllen. Das Ergebnis wird Ihnen vor dem Abschlusstest aber *nicht* rückgemeldet.“

15 Minuten
länger studieren

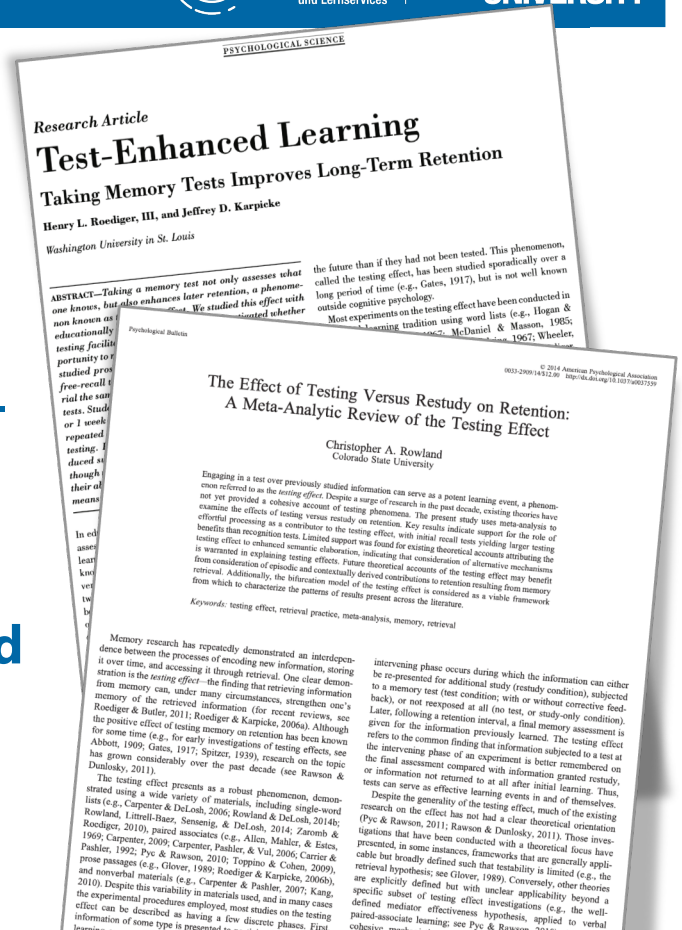
Quiz ohne
Rückmeldung

Der Testing Effekt

Empirische Evidenz

Alleine das Ablegen eines Tests kann zu **erheblich besserer Lern-leistung** und **Transfer** führen.

Gründe liegen unter anderem in einer verstärkten **Aktivierung und Konsolidierung** im gebildeten Wissensnetzwerk (“Bifurkationseffekt”).



PSYCHOLOGICAL SCIENCE

Research Article

Test-Enhanced Learning

Taking Memory Tests Improves Long-Term Retention

Henry L. Roediger, III, and Jeffrey D. Karpicke

Washington University in St. Louis

ABSTRACT—*Taking a memory test not only assesses what one knows, but also enhances later retention, a phenomenon known as the testing effect. We studied this effect with educationally*

Psychological Bulletin

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0033-2909/14/$12.00 http://dx.doi.org/10.1037/a0037559

The Effect of Testing Versus Restudy on Retention: A Meta-Analytic Review of the Testing Effect

Christopher A. Rowland
Colorado State University

Engaging in a test over previously studied information can serve as a potent learning event, a phenomenon referred to as the *testing effect*. Despite a surge of research in the past decade, existing theories have not yet provided a cohesive account of testing phenomena. The present study uses meta-analysis to examine the effects of testing versus restudy on retention. Key results indicate support for the role of effortful processing as a contributor to the testing effect, with initial recall tests yielding larger testing benefits than recognition tests. Limited support was found for existing theoretical accounts attributing the testing effect to enhanced semantic elaboration, indicating that consideration of alternative mechanisms is warranted in explaining testing effects. Future theoretical accounts of the testing effect may benefit from consideration of episodic and contextually derived contributions to retention resulting from memory retrieval. Additionally, the bifurcation model of the testing effect is considered as a viable framework from which to characterize the patterns of results present across the literature.

Keywords: testing effect, retrieval practice, meta-analysis, memory, retrieval

Kontinuierliches Lernen

Kontinuierliche Leistungsüberprüfung

Online-Phase
Eigenstudium

Blended Learning
Wirksamkeit

Präsenzformate
im Blended Learning

Lehrende
Ansichten und Effekte

Quizzes

Empirische Evidenz

Die Online-Bearbeitung von Quizaufgaben verbessert **Prüfungsleistungen** und den **Langzeit-Wissensbehalt**.

Dies gilt besonders dann, wenn Quizinhalte und Prüfungsinhalte **konzeptuell ähnlich** sind.


The Generalist's Corner

Using Quizzing to Assist Student Learning in the Classroom: The Good, the Bad, and the Ugly

Khuyen Nguyen[1] and Mark A. McDaniel[1]

Abstract

Keywords

Test-Enhanced Learning in the Classroom: Long-Term Improvements From Quizzing

Henry L. Roediger III, Pooja K. Agarwal, Mark A. McDaniel, and Kathleen B. McDermott
Washington University in St. Louis

Online-Phase
Eigenstudium

Blended Learning
Wirksamkeit

Präsenzformate
im Blended Learning

Lehrende
Ansichten und Effekte

Quizzes

Empirische Evidenz

Quizzing erhöht **Zufriedenheit**, **Engagement** und **Selbstwirksamkeitserwartung**, aber auch den **Workload** bei Studierenden.

Gleichzeitig scheint es eine wichtige **Vorbedingung** für die Wirksamkeit von Blended Learning Formaten zu sein.

14
Semesterwochen

4–8
Fragen pro Woche

1
Fallvignette pro Frage

60–100
Fragen pro Semester

4–7
Antwortalternativen

500
Feedbacks für Antworten

„Die Quizfragen waren anscheinend viel zu schwer.“

„Wir waren von den vielen Rückfragen zu den Quizzes überwältigt.“

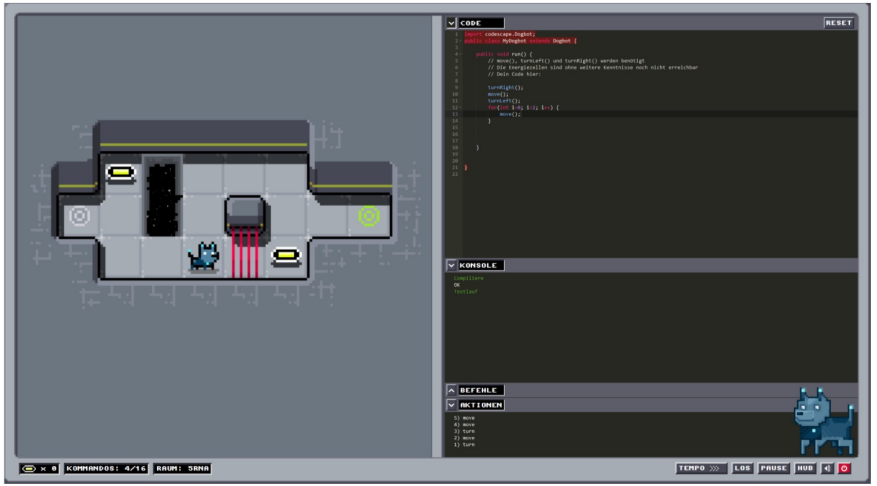
„Die meisten haben die Quizzes nicht beantwortet.“

Beteiligung sichern

- Constructive Alignment
- Prüfungsvorleistungen
- Modulbausteine

Serious Games

Ernsthaft spielen

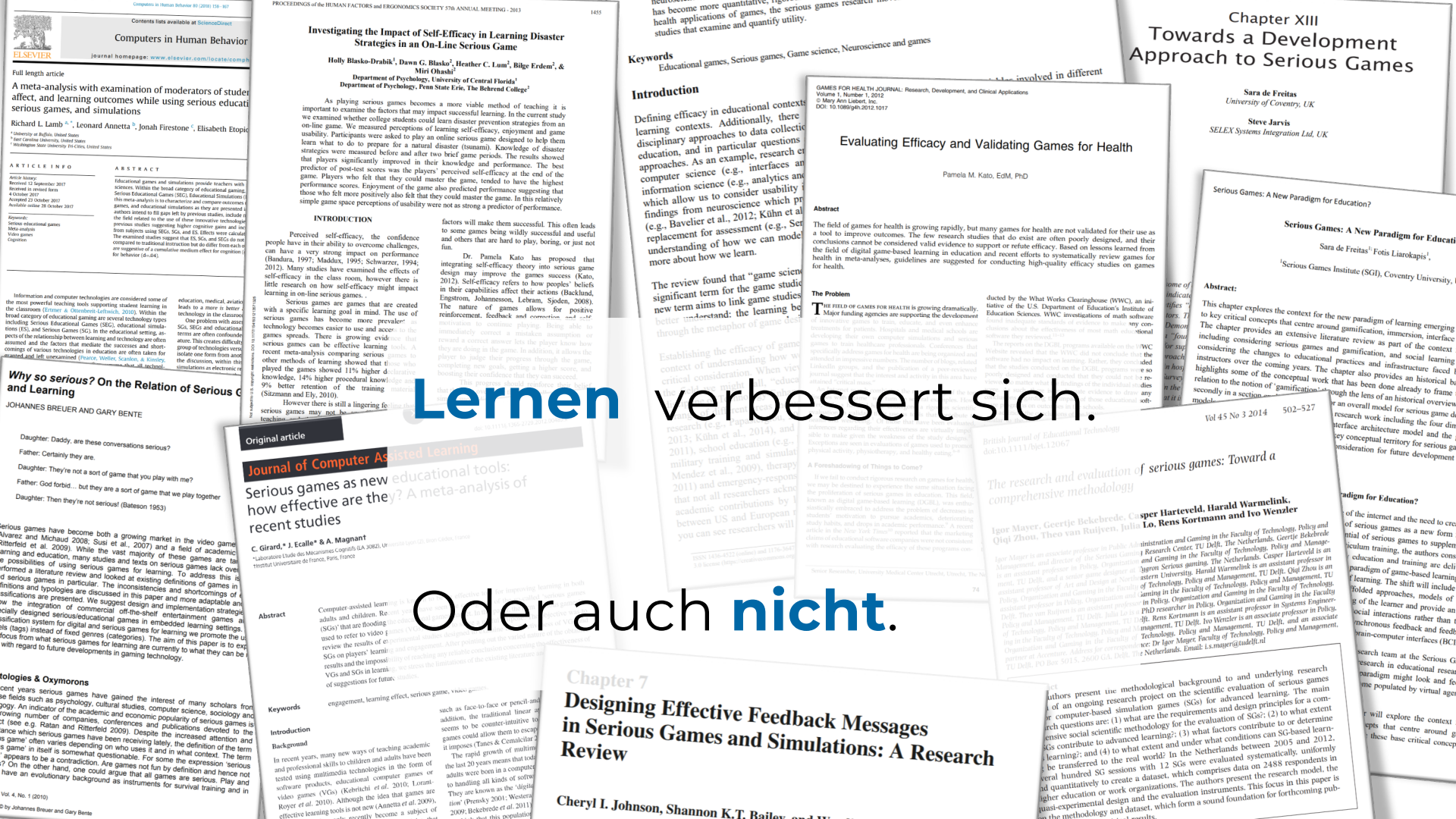


Codescape

Das Lernspiel Codescape bietet einen Einstieg in die Programmiersprache Java. Die Studierenden erkunden dabei ein Raumschiff. Die Inhalte sind zeitlich mit der Vorlesung verzahnt. Eine automatische Bewertung der Leistung entlastet die Dozierenden und ermöglicht eine schnelle Rückmeldung der Ergebnisse an die Studierenden.

Transaction

In den verschiedenen Variationen des Serious Games Transaction agieren die Studierenden als Führungskräfte eines virtuellen Unternehmens. Transaction dient der semesterbegleitenden Anwendung von im Studium erworbenen Kenntnissen. Die Wirtschaftssimulationen können self-paced eingesetzt werden, was bedeutet, dass die Studierenden die Inhalte zeitlich flexibel abrufen können. Beim Einsatz im Rahmen des Flipped Classroom Konzepts werden das Planspiel, die Präsenzveranstaltung und zuvor produzierte Videos zeitlich und inhaltlich aufeinander abgestimmt. Management-Erfolge und das Lösen von vorlesungsrelevanten Fragen und Problemen fließen abschließend in die Semesterendnote ein.


Lernen verbessert sich.
Oder auch nicht.

Serious Games

Empirische Evidenz

- Serious Games integrieren Modelle der Bildungs-, Neuro- und Informationswissenschaften sowie der Spieleentwicklung
- Forschungslage hat starke Entsprechungen zum Bereich der Gamification (u.a. Einflüsse von Persönlichkeits-eigenschaften, Lernstrategien, Vorerfahrungen)
- Zentrale Gelingensbedingungen bei Serious Games sind:
  - Sorgfältige Einführung und Begleitung durch Dozierende
  - Grad der Integration mit den übrigen Veranstaltungsinhalten
  - Hoher Grad an Verbindlichkeit (z.B. Verpflichtung, Bonuspunkte)
  - Spielimmanentes Feedback und Hilfestellungen bei Fehlern
  - Kohärente Anreizsysteme (Ethik!)


Audience Response Systeme
The ARS of Learning

12
Semesterwochen

2–4
Fragen pro Sitzung

1
Fallvignette pro Frage

4–8
Minuten pro Frage

4–7
Antwortalternativen

10–15
Minuten pro Sitzung

30–50
Durchläufe pro Semester

75

4 5% Die Hypergeometrische Verteilung beschreibt ein Ziehen mit Zurücklegen.

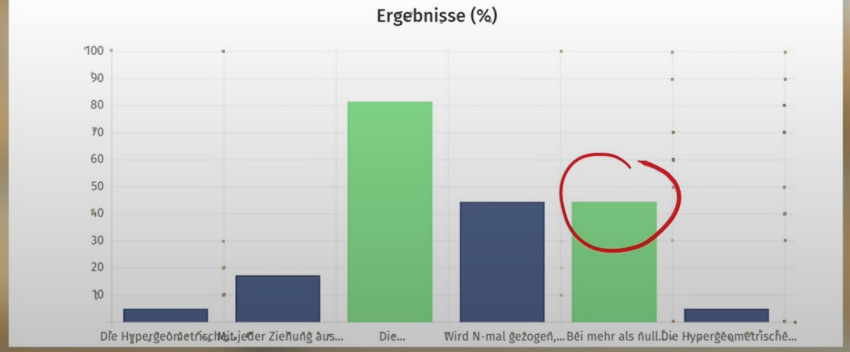
14 17% Mit jeder Ziehung aus der Grundgesamtheit sinkt die Wahrscheinlichkeit für einen Treffer in der folgenden Ziehung.

66 51% Die Wahrscheinlichkeit für einen weiteren Treffer kann ab einer bestimmten Ziehung auf Null fallen.

36 44% Wird N-mal gezogen, ist die maximal mögliche Anzahl von Treffern immer gleich N.

36 44% Bei mehr als null Treffer in der Grundgesamtheit ist die Wahrscheinlichkeit für null Treffer in einer Stichprobe niemals null.

4 5% Die Hypergeometrische Verteilung hat keine Verteilungsfunktion.



25

4 5% Die Hypergeometrische Verteilung beschreibt ein Ziehen mit Zurücklegen.

14 17% Mit jeder Ziehung aus der Grundgesamtheit sinkt die Wahrscheinlichkeit für einen Treffer in der folgenden Ziehung.

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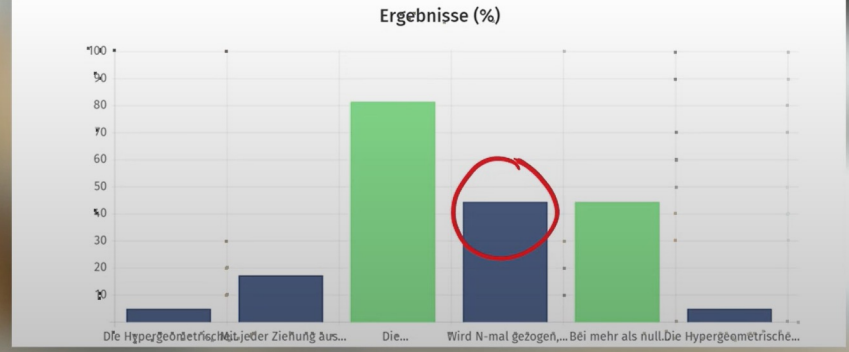


Online-Phase
Eigenstudium

Blended Learning
Wirksamkeit

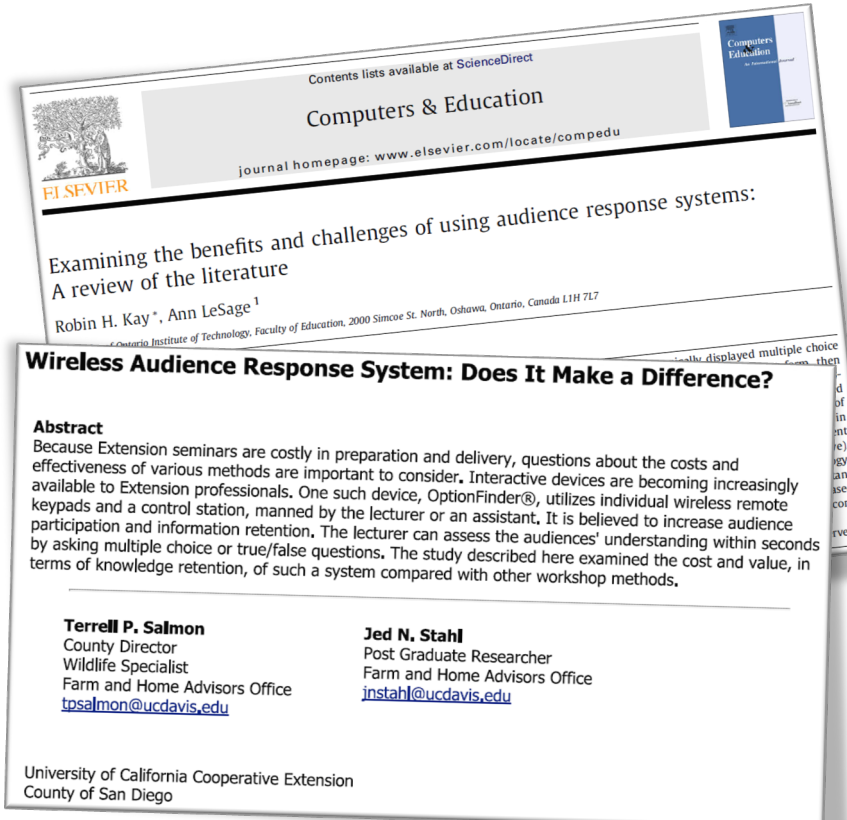
Präsenzformate
im Blended Learning

Lehrende
Ansichten und Effekte

ARS

Empirische Evidenz

Audience Response Systems erhöhen **Teilnahme**, **Aufmerksamkeit** und **Engagement** der Studierenden und führen (kurzfristig) zu **besserer Lernleistung**.



Contents lists available at ScienceDirect

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

Examining the benefits and challenges of using audience response systems: A review of the literature

Robin H. Kay *, Ann LeSage [1]

Wireless Audience Response System: Does It Make a Difference?

Abstract

Because Extension seminars are costly in preparation and delivery, questions about the costs and effectiveness of various methods are important to consider. Interactive devices are becoming increasingly available to Extension professionals. One such device, OptionFinder®, utilizes individual wireless remote keypads and a control station, manned by the lecturer or an assistant. It is believed to increase audience participation and information retention. The lecturer can assess the audiences' understanding within seconds by asking multiple choice or true/false questions. The study described here examined the cost and value, in terms of knowledge retention, of such a system compared with other workshop methods.

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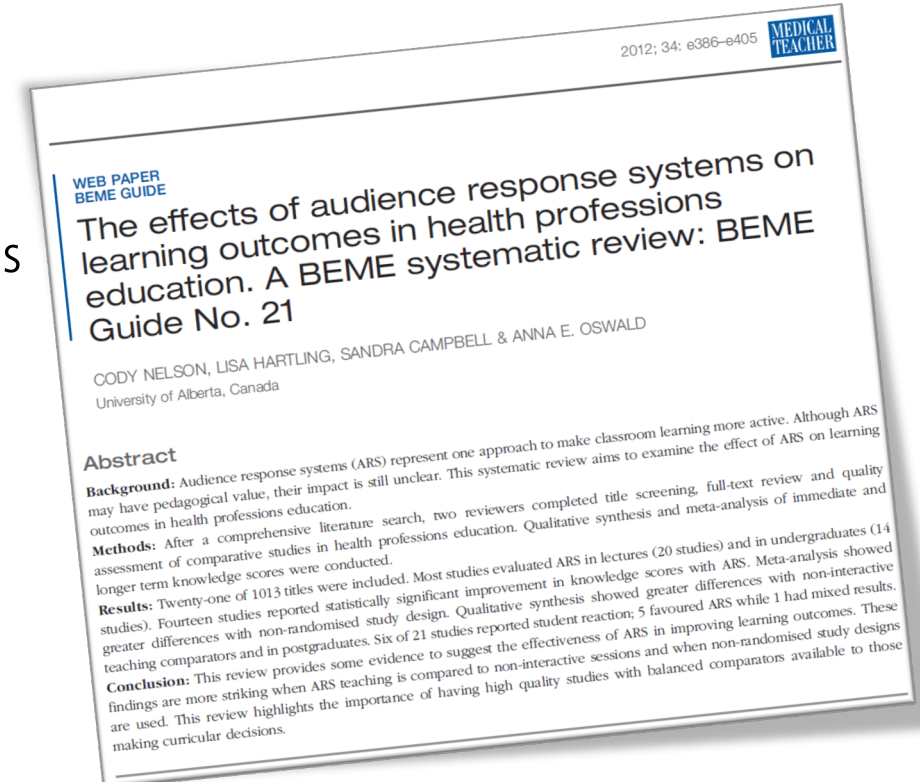
County of San Diego

ARS

Empirische Evidenz

Audience Response Systems kontrollieren Wissen und steigern fachbezogenes Selbstverstrauen.

Zudem finden sich kaum negative Effekte.



2012; 34: e386–e405 MEDICAL TEACHER

WEB PAPER
BEME GUIDE

The effects of audience response systems on learning outcomes in health professions education. A BEME systematic review: BEME Guide No. 21

CODY NELSON, LISA HARTLING, SANDRA CAMPBELL & ANNA E. OSWALD
University of Alberta, Canada

Abstract

Background: Audience response systems (ARS) represent one approach to make classroom learning more active. Although ARS may have pedagogical value, their impact is still unclear. This systematic review aims to examine the effect of ARS on learning outcomes in health professions education.

Methods: After a comprehensive literature search, two reviewers completed title screening, full-text review and quality assessment of comparative studies in health professions education. Qualitative synthesis and meta-analysis of immediate and longer term knowledge scores were conducted.

Results: Twenty-one of 1013 titles were included. Most studies evaluated ARS in lectures (20 studies) and in undergraduates (14 studies). Fourteen studies reported statistically significant improvement in knowledge scores with ARS. Meta-analysis showed greater differences with non-randomised study design. Qualitative synthesis showed greater differences with non-interactive teaching comparators and in postgraduates. Six of 21 studies reported student reaction; 5 favoured ARS while 1 had mixed results.

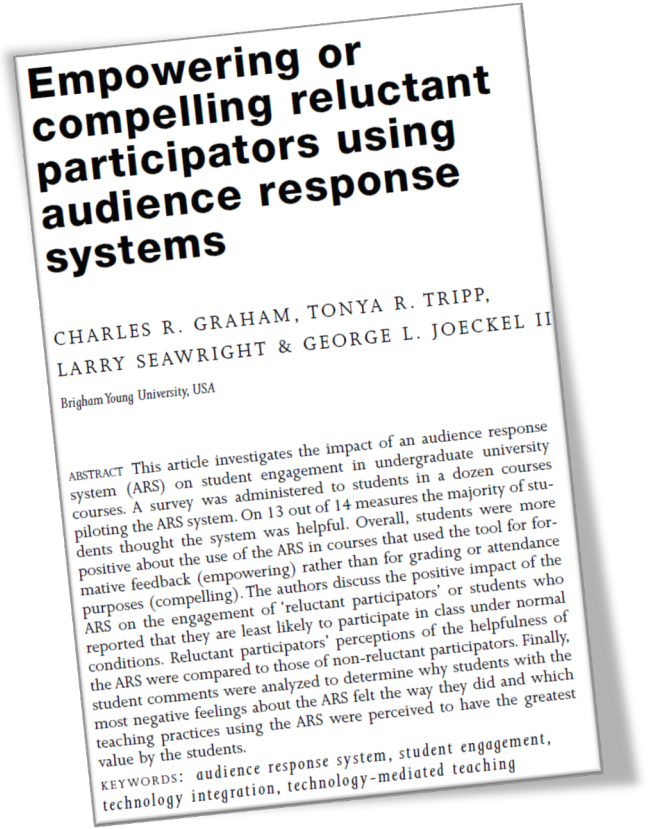
Conclusion: This review provides some evidence to suggest the effectiveness of ARS in improving learning outcomes. These findings are more striking when ARS teaching is compared to non-interactive sessions and when non-randomised study designs are used. This review highlights the importance of having high quality studies with balanced comparators available to those making curricular decisions.

ARS

Empirische Evidenz

Aktive und passive Studierende haben gleichermaßen positive Einstellungen zu Audience Response Systemen.

Allerdings nur bei Anonymität und ohne Benotung.



Empowering or compelling reluctant participators using audience response systems

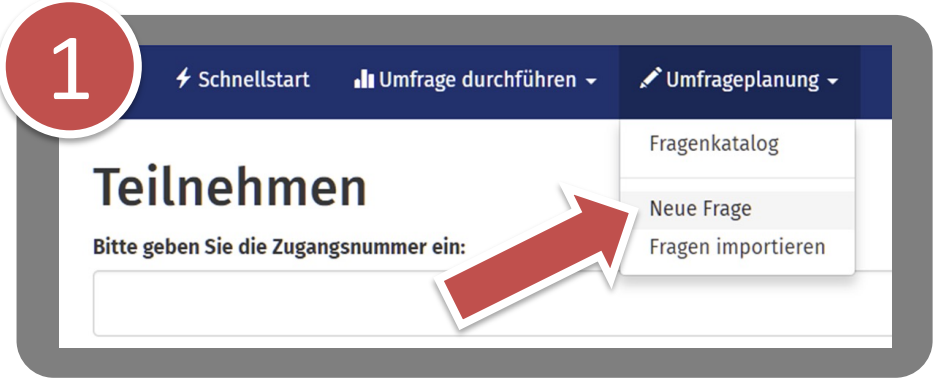
CHARLES R. GRAHAM, TONYA R. TRIPP, LARRY SEAWRIGHT & GEORGE L. JOECKEL II

Brigham Young University, USA

ABSTRACT This article investigates the impact of an audience response system (ARS) on student engagement in undergraduate university courses. A survey was administered to students in a dozen courses piloting the ARS system. On 13 out of 14 measures the majority of students thought the system was helpful. Overall, students were more positive about the use of the ARS in courses that used the tool for formative feedback (empowering) rather than for grading or attendance purposes (compelling). The authors discuss the positive impact of the ARS on the engagement of 'reluctant participators' or students who reported that they are least likely to participate in class under normal conditions. Reluctant participators' perceptions of the helpfulness of the ARS were compared to those of non-reluctant participators. Finally, student comments were analyzed to determine why students with the most negative feelings about the ARS felt the way they did and which teaching practices using the ARS were perceived to have the greatest value by the students.

KEYWORDS: audience response system, student engagement, technology integration, technology-mediated teaching

1



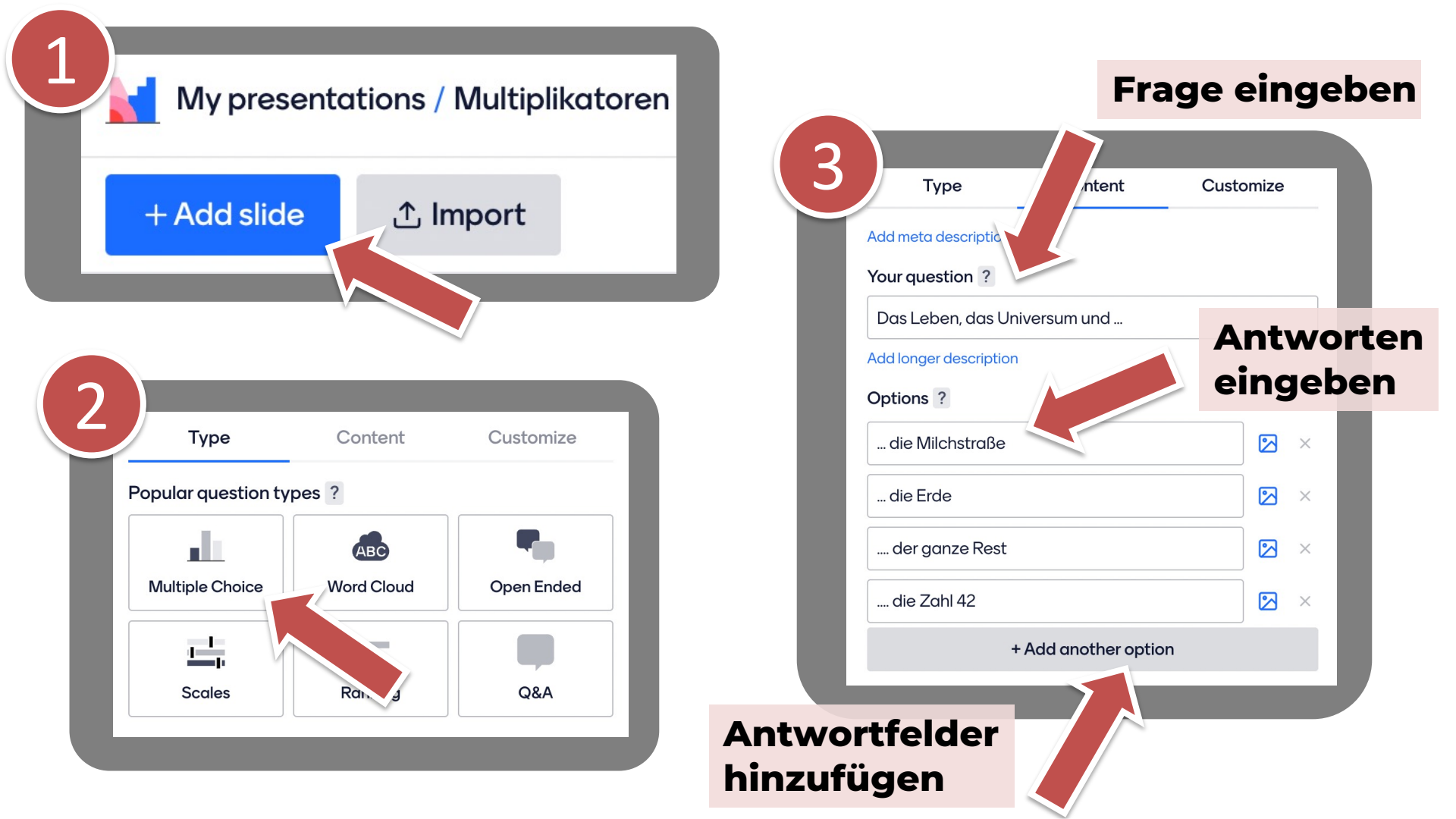
2

Frage eingeben

3

Antworten eingeben

Antwortfelder hinzufügen


1
My presentations / Multiplikatoren
+ Add slide
Import
2
Type
Content
Customize
Popular question types
Multiple Choice
Word Cloud
Open Ended
Scales
Q&A
3
Type
Customize
Add meta descriptio
Your question
Das Leben, das Universum und ...
Add longer description
Options
... die Milchstraße
... die Erde
.... der ganze Rest
.... die Zahl 42
+ Add another option
Frage eingeben
Antworten eingeben
Antwortfelder hinzufügen

Online-Phase
Eigenstudium

Blended Learning
Wirksamkeit

Präsenzformate
im Blended Learning

Lehrende
Ansichten und Effekte

Quizralleye

Empirische Evidenz

Serien von kurzen Quizfragen, meist vor oder nach einer Lehrveranstaltung durchgeführt, werden als Quizralleye bezeichnet.

Ihr Schwierigkeitsgrad sollte eher mittel bis niedrig sein.

Online-Phase
Eigenstudium

Blended Learning
Wirksamkeit

Präsenzformate
im Blended Learning

Lehrende
Ansichten und Effekte

Quizralleye

Empirische Evidenz

Positive Effekte finden sich vor allem bei sekundären Wirksamkeitsmaßen wie Motivation, Aufmerksamkeit, Engagement, Interesse.

Die Lernwirksamkeit scheint bei Quizralleyes vor der Veranstaltung höher zu sein.


The Impact of Pre-Lecture Quizzes on Students' Performance in Blended Learning

Cristina-Claudia OSMAN
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Comparison of the Impact of Pre- and Post-Lecture Quizzes on Student Learning in an Engineering Economics Course

Rick T. Olson
University of San Diego

Abstract

In the past, the author has occasionally used the WebCT course delivery system to administer quizzes to encourage students to read the text before lecture. These qu... highlights of the material and were intended to ... for the lecture. During the Sp... San Diego ...

Routledge
Taylor & Francis Grou

METHODS AND TECHNIQUES

Mastery Quizzing as a Signaling Device to Cue Attention to Lecture Material

effrey S. Nevid and Katie Mahon
t. John's University

Student Generated Content

From Learning to Teaching

Online-Phase
Eigenstudium

Blended Learning
Wirksamkeit

Präsenzformate
im Blended Learning

Lehrende
Ansichten und Effekte

Student Generated Con

Empirische Evidenz

Motivation und **Workload** steigen, **Lernerfahrung** wird positiver beurteilt und **Kompetenzzuwächse** als stärker wahrgenommen.

Insbesondere Student Generated Media (z.B. Videos, Podcasts) steigert kaum den **Lern-** und **Fertigkeitenerwerb**.

Online-Phase
Eigenstudium

Blended Learning
Wirksamkeit

Präsenzformate
im Blended Learning

Lehrende
Ansichten und Effekte

Student Generated Con

Empirische Evidenz

Es entwickelt sich oft ein **“Ästhtetikfokus”** bei den Studierenden.

Studierende erwerben mehr **“Soft Skills”** als Fachinhalte

A learning design for student-generated digital storytelling

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University of Technology, Sydney, Australia
Matthew.Kearney@uts.edu.au

Abstract: The literature on digital video in education emphasises the use of pre-fabricated, instructional style video assets. Learning designs for supporting the use of these expert-generated video products have been developed (e.g. Burden & Atkinson, 2008). However, there has been a paucity of pedagogical frameworks for facilitating specific genres of learner-generated video projects. Informed by two studies, this paper describes the development of a learning design for a popular genre: learner-generated digital storytelling. A particular learning design representation is used to present a structured description [illegible] storytelling and issues are raised relating to future iterat[illegible]

Keywords: learning design lea[illegible]

Intro[illegible]

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THE VALUE OF STUDENT CREATED VIDEOS IN THE COLLEGE CLASSROOM – AN EXPLORATORY STUDY IN MARKETING AND ACCOUNTING

Henry Greene and Cheryl Crespi

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This paper investigates the perceived value of college student created videos as a tool for enhancing the student learning experience. Two different business courses are examined: one of the courses is an undergraduate accounting course and the other is an undergraduate marketing course, both in a school of business in a comprehensive state university in the northeast. In the marketing course, students are required to create videos as part of their grade assessment; in the accounting class, creating videos is an optional extra credit assignment. Qualitative research was conducted by asking students to write brief responses describing their experience with creating videos. Descriptive statistics were gathered in an effort to assess student satisfaction and appreciation for the video creation experience. The results of the research suggest that students appreciate the video experience; they find it relevant and entertaining. They also report that it helps reinforce concepts they have been exposed to in class.

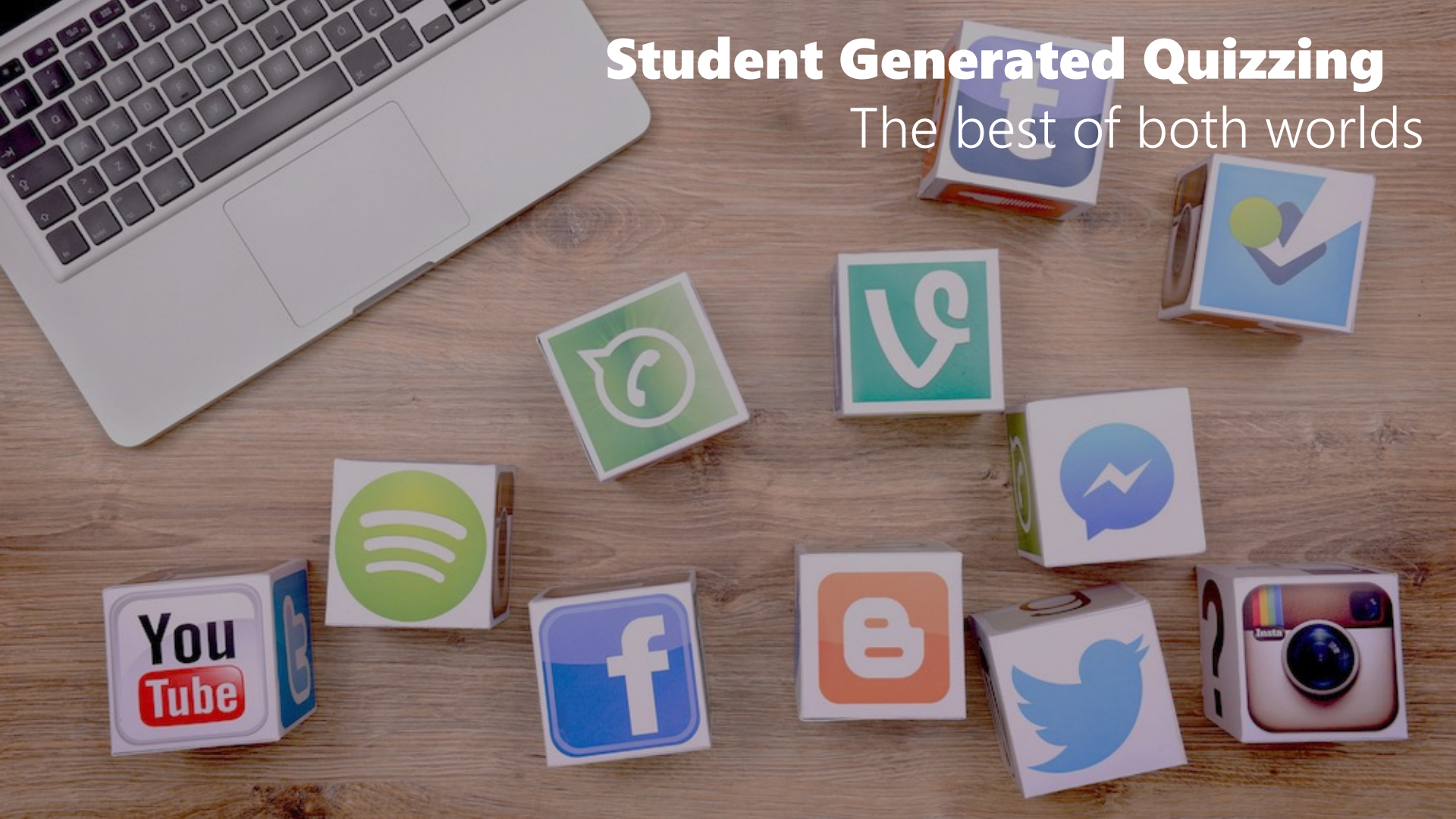
Keywords: Student created videos, Student generated videos, Active learning.

Introduction

The research literature is ample regarding the value of incorporating digital videos in the classroom. For the most part, academics discuss the use of professionally made videos as supplements to lectures, providing students with realistic situations, images and discussion from industry practitioners, adding an experiential flavor to the classroom instruction. There are also examples in the research literature of instructors creating digital material to supplement class content through podcasts, vodcasts and short digital videos. Much less discussed is the use of college student, created videos as an active learning assignment. This paper assists in mitigating this deficiency by investigating the use of college student, created videos in the classroom, and by evaluating the relevancy and student perceived satisfaction of the

Student Generated Quizzing

The best of both worlds



Online-Phase
Eigenstudium

Blended Learning
Wirksamkeit

Präsenzformate
im Blended Learning

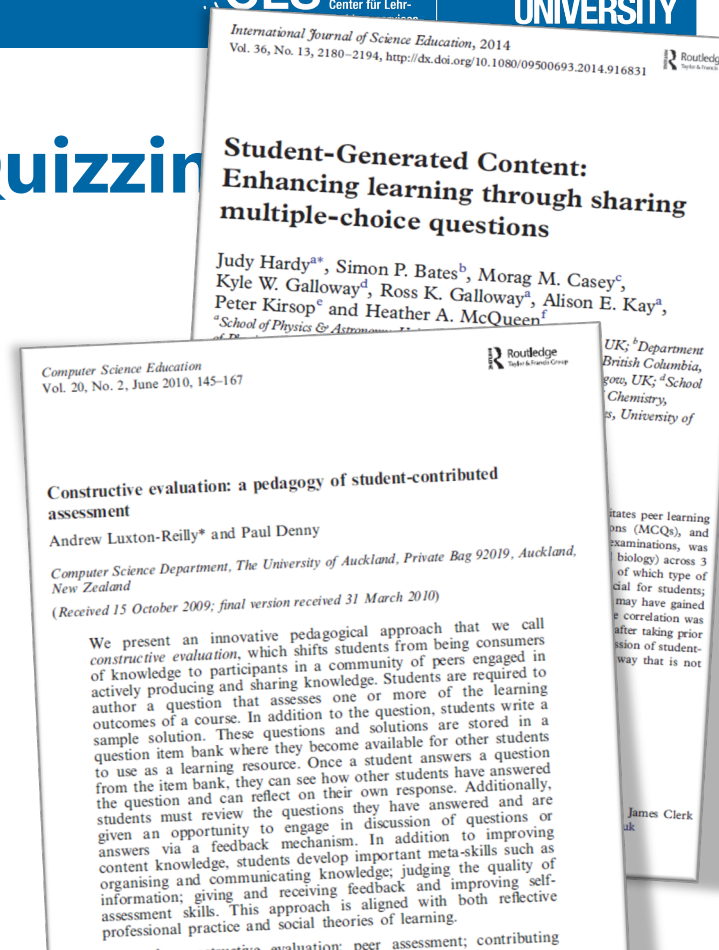
Lehrende
Ansichten und Effekte

Student Generated Quizzin

Empirische Evidenz

Studentische Generierung von ARS Fragen steigert **Lernleistung** erheblich und meist das **Konzeptverständnis**.

Meta-Kompetenzen wie Selbst- und Fremdbewertung sowie die Qualität der **Feedbackgabe** steigen.



International Journal of Science Education, 2014
Vol. 36, No. 13, 2180–2194, http://dx.doi.org/10.1080/09500693.2014.916831

Student-Generated Content: Enhancing learning through sharing multiple-choice questions

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Computer Science Education
Vol. 20, No. 2, June 2010, 145–167

Constructive evaluation: a pedagogy of student-contributed assessment

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(Received 15 October 2009; final version received 31 March 2010)

We present an innovative pedagogical approach that we call *constructive evaluation*, which shifts students from being consumers of knowledge to participants in a community of peers engaged in actively producing and sharing knowledge. Students are required to author a question that assesses one or more of the learning outcomes of a course. In addition to the question, students write a sample solution. These questions and solutions are stored in a question item bank where they become available for other students to use as a learning resource. Once a student answers a question from the item bank, they can see how other students have answered the question and can reflect on their own response. Additionally, students must review the questions they have answered and are given an opportunity to engage in discussion of questions or answers via a feedback mechanism. In addition to improving content knowledge, students develop important meta-skills such as organising and communicating knowledge; judging the quality of information; giving and receiving feedback and improving self-assessment skills. This approach is aligned with both reflective professional practice and social theories of learning.

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Student Generated Quizzin

Empirische Evidenz

Positive Wirkungen auf **Adhärenz**, **Vorbereitungsgrad**, **Interaktion** und **Kommunikation**.

Wirkungstransfer in andere Domänen (z.B. Schreiben, Analyse, Reflektion).

Hohe **psychometrische Qualität** der generierten Fragen.


Q&A
Jederzeit Fragen

https://frag.jetzt

Konto

Welcher Raum?

Wie heißt der Raum, wo die Sitzung stattfindet?

Raum buchen?

Deine Sitzungsliste ist leer.

Einführung

Anzeige

Sprache

Datenschutz

Impressum

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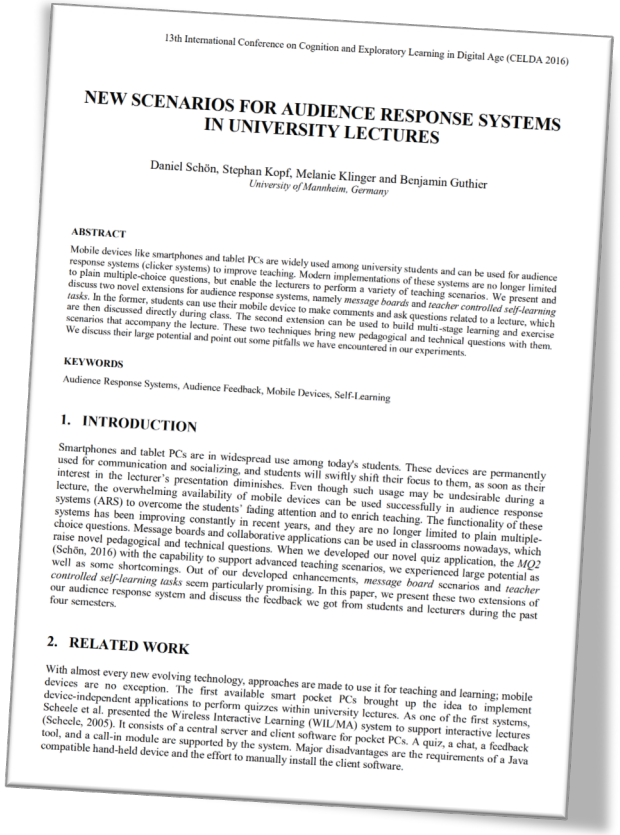
Q&A

(Anonym) Fragen stellen lassen

Auditorien können **jederzeit Fragen** stellen.

Q&A sind **synchron** („während“) oder **asynchron** („vor/nach“) durchführbar.

Viele Systeme lassen ein **Rating** der Fragen zu.



13th International Conference on Cognition and Exploratory Learning in Digital Age (CELDA 2016)

NEW SCENARIOS FOR AUDIENCE RESPONSE SYSTEMS IN UNIVERSITY LECTURES

Daniel Schön, Stephan Kopf, Melanie Klinger and Benjamin Guthier
University of Mannheim, Germany

ABSTRACT

Mobile devices like smartphones and tablet PCs are widely used among university students and can be used for audience response systems (clicker systems) to improve teaching. Modern implementations of these systems are no longer limited to plain multiple-choice questions, but enable the lecturers to perform a variety of teaching scenarios. We present and discuss two novel extensions for audience response systems, namely *message boards* and *teacher controlled self-learning tasks*. In the former, students can use their mobile device to make comments and ask questions related to a lecture, which are then discussed directly during class. The second extension can be used to build multi-stage learning and exercise scenarios that accompany the lecture. These two techniques bring new pedagogical and technical questions with them. We discuss their large potential and point out some pitfalls we have encountered in our experiments.

KEYWORDS

Audience Response Systems, Audience Feedback, Mobile Devices, Self-Learning

1. INTRODUCTION

Smartphones and tablet PCs are in widespread use among today's students. These devices are permanently used for communication and socializing, and students will swiftly shift their focus to them, as soon as their interest in the lecturer's presentation diminishes. Even though such usage may be undesirable during a lecture, the overwhelming availability of mobile devices can be used successfully in audience response systems (ARS) to overcome the students' fading attention and to enrich teaching. The functionality of these systems has been improving constantly in recent years, and they are no longer limited to plain multiple-choice questions. Message boards and collaborative applications can be used in classrooms nowadays, which raise novel pedagogical and technical questions. When we developed our novel quiz application, the *MQ2* (Schön, 2016) with the capability to support advanced teaching scenarios, we experienced large potential as well as some shortcomings. Out of our developed enhancements, *message board* scenarios and *teacher controlled self-learning tasks* seem particularly promising. In this paper, we present these two extensions of our audience response system and discuss the feedback we got from students and lecturers during the past four semesters.

2. RELATED WORK

With almost every new evolving technology, approaches are made to use it for teaching and learning; mobile devices are no exception. The first available smart pocket PCs brought up the idea to implement device-independent applications to perform quizzes within university lectures. As one of the first systems, Scheele et al. presented the Wireless Interactive Learning (WIL/MA) system to support interactive lectures (Scheele, 2005). It consists of a central server and client software for pocket PCs. A quiz, a chat, a feedback tool, and a call-in module are supported by the system. Major disadvantages are the requirements of a Java compatible hand-held device and the effort to manually install the client software.

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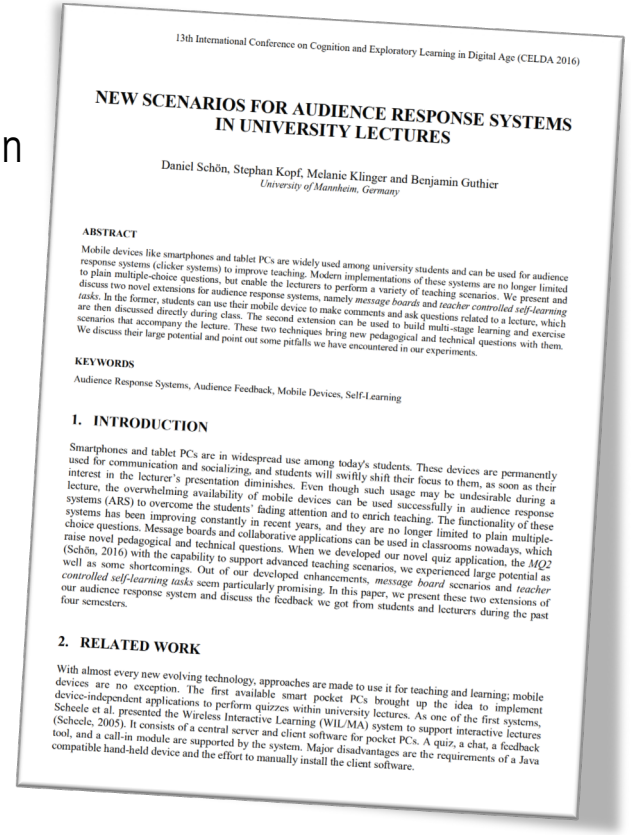
Q&A

Fragen stellen lassen – synchron oder asynchron

Planungsaspekte wie **Zeit für Fragen** und **Rating** sind zu berücksichtigen

Unter Umständen ist eine **Moderation** notwendig

Ergebnisdokumentation ist nicht ohne Schwierigkeiten



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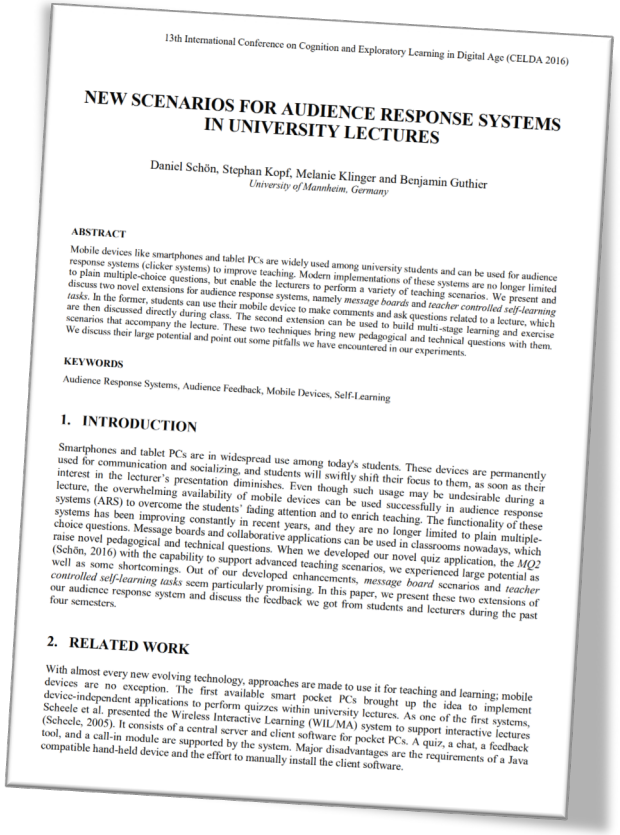
Q&A

Empirische Evidenz

Die Anzahl digital gestellter Fragen ist um ein Vielfaches **höher** als bei "Aufzeigen" -> **Anonymität**

Lernstände und **Lerndefizite** sind für Lehrende gut abzuschätzen.



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Vorlesung Psychologie (Multivariate Verfahren) (VO) [20ws-72.72001]

Auf dieser Seite finden sich die Antworten zu den frag.jetzt Einträgen

Als erledigt kennzeichnen

Hier findet Ihr die Beantwortung der frag.jetzt Einträge. Die Reihenfolge entspricht weitgehend derjenigen, in der die Fragen gestellt wurden. Wenn eine Frage beantwortet wurde, ist in frag.jetzt das grüne OK-Häkchen rechts über der Frage sichtbar.

Hinweis: Fragen mit einer kurzen Antwort werden direkt in frag.jetzt beantwortet. Ihr erkennt das am farbigen Kommentarsymbol, das rechts über der Frage erscheint. Klickt in dem Fall einfach auf die Frage, um die Antwort zu sehen.

Eure Fragen

Für Fragen mit längeren Antworten finden sich die Erklärungen hier. Klickt auf den Fragentext, um zur Antwort zu springen.

Frage 1: Wieso gibt es einen gemeinsamen Determinationskoeffizienten und nicht für jede UV separat? Ich will doch gerne wissen, wie viel Varianz der AV durch die einzelnen UV's erklärt werden?

Frage 2: Zum vorletzten Lernvideo der Lerneinheit 1, wo es um das R^2 geht: 73% der AV werden durch die UV's erklärt. Sind die restlichen 27% Messfehler oder andere Drittvariablen?

Frage 2a: Direkt die Fortsetzung zu Frage 2: Es ist ja nicht so, dass sich (hypothetisch unendlich viele) Drittvariablen auf die 27% verteilen. Aber wenn man davon ausgeht, dass eine Variable 100% hat und 73% durch die UV's erklärt werden, wirken die 73% unrealisch hoch.

Frage 3: Wieso gibt es bei der multiplen Regression ein gemeinsames Intercept? Ist das nicht unlogisch bei mehreren Prädiktoren, wenn sie bspw. in die andere Richtung gehen? Die negative & positive Gerade müssten die Y-Achse an derselben Stelle schneiden?

Frage 4: Wie kann ich die Console leeren? Muss ich dafür jedes Mal RStudio neu starten?

Frage 5: Video 03.03: Eine Voraussetzung für eine gute Regressionsgleichung ist die Verme… Ein

Chat Support

Gruppenarbeitsformen

Digital kollaborieren

Think! Pair! Share!

1.

überlegen

2.

austauschen

3.

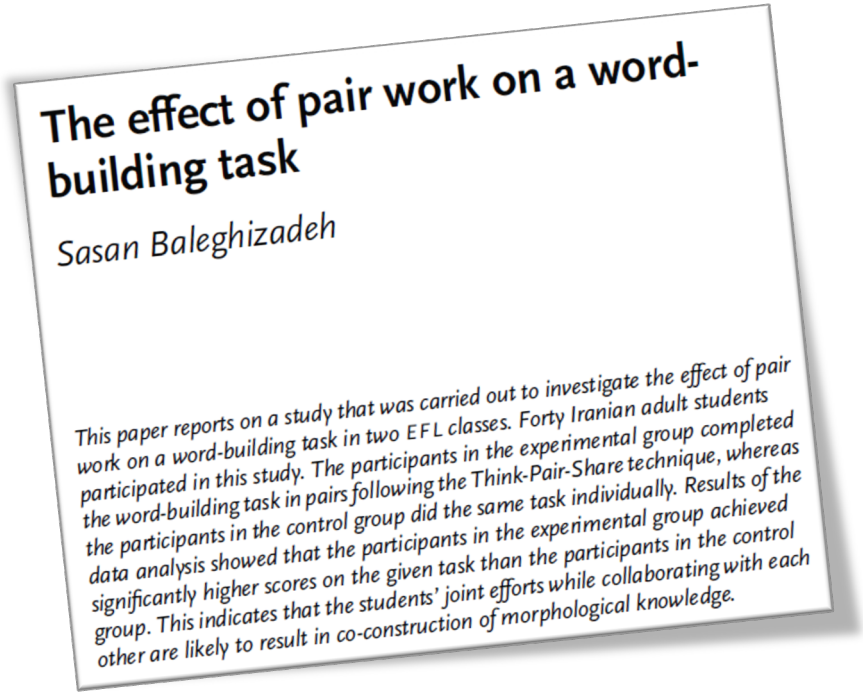
und vortragen

Quelle: http://schuelerecke.net/schule/wp-content/uploads/2010/06/ThinkPairShare.jpg

Gruppenarbeit

Empirische Evidenz

Probanden in Kleingruppen erzielen **signifikant bessere Leistungen** durch die Ko-Konstruktion von Wissen beim kollaborativen Arbeiten.



The effect of pair work on a word-building task

Sasan Baleghizadeh

This paper reports on a study that was carried out to investigate the effect of pair work on a word-building task in two EFL classes. Forty Iranian adult students participated in this study. The participants in the experimental group completed the word-building task in pairs following the Think-Pair-Share technique, whereas the participants in the control group did the same task individually. Results of the data analysis showed that the participants in the experimental group achieved significantly higher scores on the given task than the participants in the control group. This indicates that the students' joint efforts while collaborating with each other are likely to result in co-construction of morphological knowledge.

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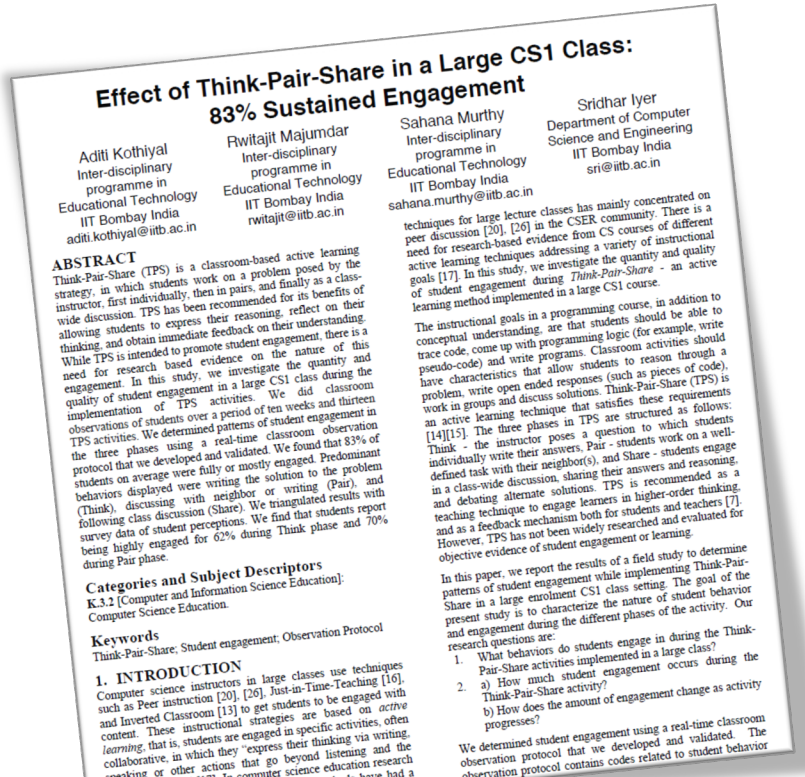
Gruppenarbeit

Empirische Evidenz

Gruppenarbeitsformate (z.B. Think-Pair-Share) erzielen deutlich höhere **Aktivierung der Studierenden** und reduziert mentalen Absentismus.



Effect of Think-Pair-Share in a Large CS1 Class: 83% Sustained Engagement

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ABSTRACT
Think-Pair-Share (TPS) is a classroom-based active learning strategy, in which students work on a problem posed by the instructor, first individually, then in pairs, and finally as a class-wide discussion. TPS has been recommended for its benefits of allowing students to express their reasoning, reflect on their thinking, and obtain immediate feedback on their understanding. While TPS is intended to promote student engagement, there is a need for research based evidence on the nature of this engagement. In this study, we investigate the quantity and quality of student engagement in a large CS1 class during the implementation of TPS activities. We did classroom observations of students over a period of ten weeks and thirteen TPS activities. We determined patterns of student engagement in the three phases using a real-time classroom observation protocol that we developed and validated. We found that 83% of students on average were fully or mostly engaged. Predominant behaviors displayed were writing the solution to the problem (Think), discussing with neighbor or writing (Pair), and following class discussion (Share). We triangulated results with survey data of student perceptions. We find that students report being highly engaged for 62% during Think phase and 70% during Pair phase.

Categories and Subject Descriptors
K.3.2 [Computer and Information Science Education]: Computer Science Education.

Keywords
Think-Pair-Share; Student engagement; Observation Protocol

1. INTRODUCTION
Computer science instructors in large classes use techniques such as Peer instruction [20], [26], Just-in-Time-Teaching [16], and Inverted Classroom [13] to get students to be engaged with content. These instructional strategies are based on *active learning*, that is, students are engaged in specific activities, often collaborative, in which they "express their thinking via writing, speaking or other actions that go beyond listening and the

techniques for large lecture classes has mainly concentrated on peer discussion [20], [26] in the CSER community. There is a need for research-based evidence from CS courses of different active learning techniques addressing a variety of instructional goals [17]. In this study, we investigate the quantity and quality of student engagement during *Think-Pair-Share* - an active learning method implemented in a large CS1 course.

The instructional goals in a programming course, in addition to conceptual understanding, are that students should be able to trace code, come up with programming logic (for example, write pseudo-code) and write programs. Classroom activities should have characteristics that allow students to reason through a problem, write open ended responses (such as pieces of code), work in groups and discuss solutions. Think-Pair-Share (TPS) is an active learning technique that satisfies these requirements [14][15]. The three phases in TPS are structured as follows: Think - the instructor poses a question to which students individually write their answers, Pair - students work on a well-defined task with their neighbor(s), and Share - students engage in a class-wide discussion, sharing their answers and reasoning, and debating alternate solutions. TPS is recommended as a teaching technique to engage learners in higher-order thinking, and as a feedback mechanism both for students and teachers [7]. However, TPS has not been widely researched and evaluated for objective evidence of student engagement or learning.

In this paper, we report the results of a field study to determine patterns of student engagement while implementing Think-Pair-Share in a large enrolment CS1 class setting. The goal of the present study is to characterize the nature of student behavior and engagement during the different phases of the activity. Our research questions are:

1. What behaviors do students engage in during the Think-Pair-Share activities implemented in a large class?
2. a) How much student engagement occurs during the Think-Pair-Share activity?
   b) How does the amount of engagement change as activity progresses?

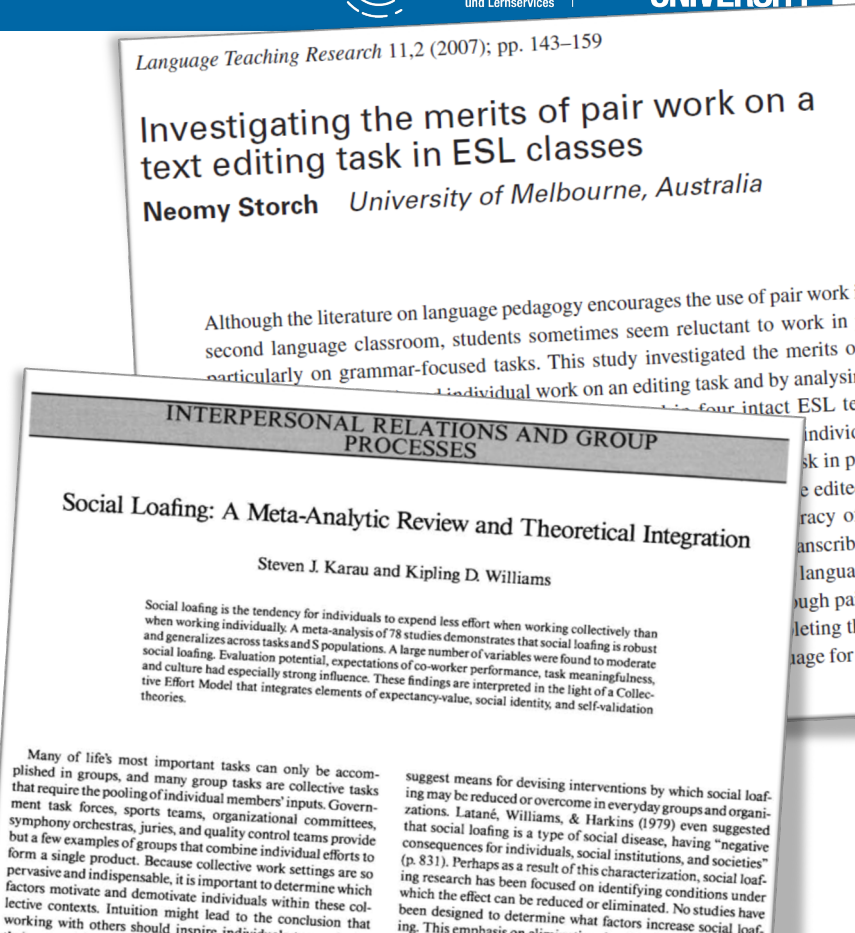
We determined student engagement using a real-time classroom observation protocol that we developed and validated. The observation protocol contains codes related to student behavior

Gruppenarbeit

Empirische Evidenz

Der Erfolg von Gruppenarbeit hängt von einer wirksamen Verhinderung des **Social Loafing** ab, z.B. durch Verpflichtung zur Ergebnis-dokumentation.

(Social Loafing = Nichtstun aufgrund von Nicht-identifizierbarkeit der eigenen Leistung)



Language Teaching Research 11,2 (2007); pp. 143–159

Investigating the merits of pair work on a text editing task in ESL classes

Neomy Storch *University of Melbourne, Australia*

Although the literature on language pedagogy encourages the use of pair work
second language classroom, students sometimes seem reluctant to work in
particularly on grammar-focused tasks. This study investigated the merits o
individual work on an editing task and by analysi

INTERPERSONAL RELATIONS AND GROUP PROCESSES

Social Loafing: A Meta-Analytic Review and Theoretical Integration

Steven J. Karau and Kipling D. Williams

Social loafing is the tendency for individuals to expend less effort when working collectively than when working individually. A meta-analysis of 78 studies demonstrates that social loafing is robust and generalizes across tasks and S populations. A large number of variables were found to moderate social loafing. Evaluation potential, expectations of co-worker performance, task meaningfulness, and culture had especially strong influence. These findings are interpreted in the light of a Collective Effort Model that integrates elements of expectancy-value, social identity, and self-validation theories.

Many of life's most important tasks can only be accomplished in groups, and many group tasks are collective tasks that require the pooling of individual members' inputs. Government task forces, sports teams, organizational committees, symphony orchestras, juries, and quality control teams provide but a few examples of groups that combine individual efforts to form a single product. Because collective work settings are so pervasive and indispensable, it is important to determine which factors motivate and demotivate individuals within these collective contexts. Intuition might lead to the conclusion that working with others should inspire

suggest means for devising interventions by which social loafing may be reduced or overcome in everyday groups and organizations. Latané, Williams, & Harkins (1979) even suggested that social loafing is a type of social disease, having "negative consequences for individuals, social institutions, and societies" (p. 831). Perhaps as a result of this characterization, social loafing research has been focused on identifying conditions under which the effect can be reduced or eliminated. No studies have been designed to determine what factors increase social loaf-

Social Loafing verhindern

Online: Werkzeuge zur Ergebnisdokumentation

- Freitext-Frage in einem ARS
- Q&A (https://frag.jetzt/)
- Online-Whiteboards (https://miro.com)
- Google Docs/Sheets/Slides
- Etherpad (Moodle, https://yopad.eu/)
- Assignments in Moodle
- Mindmapping (https://www.mindmeister.com/)

Zusammenfassung

- Lehren, Lernen und Prüfen gemeinsam denken
- Kontinuierliche Aktivierung
- Evaluieren und Analysieren

Bildquelle: https://unsplash,com