

# LEARNERS' PERFORMANCE CRITERIA IN DIGITAL LEARNING ENVIRONMENTS

## SYSTEMATIC LITERATURE REVIEW

Elke Kümmel, Gabriele Irle, Johannes Moskaliuk, Joachim Kimmerle, & Ulrike Cress

**Problem:** Heterogeneous definitions of learning with digital media and great variety of measures of learning success

**Research goal:** Review of prototypical approaches that are used for operationalizing learning outcomes in existing research on digital learning environments

### Database search within Web of Science

#### Search terms

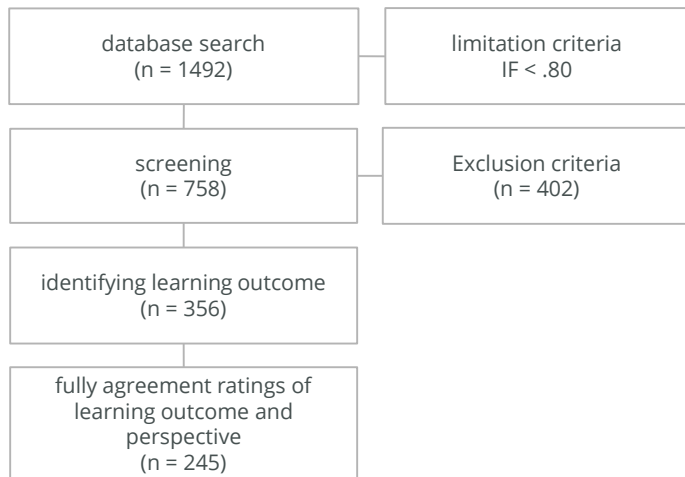
- ✓ online OR e-learning OR digital OR media OR virtual OR computer-based OR web-based, AND
- ✓ teaching OR learning OR instruction OR tutoring, AND
- ✓ higher education OR campus OR university OR undergraduate OR graduate, AND
- ✓ performance OR achievement OR grade point average OR GPA OR knowledge test.

#### Limitation criteria

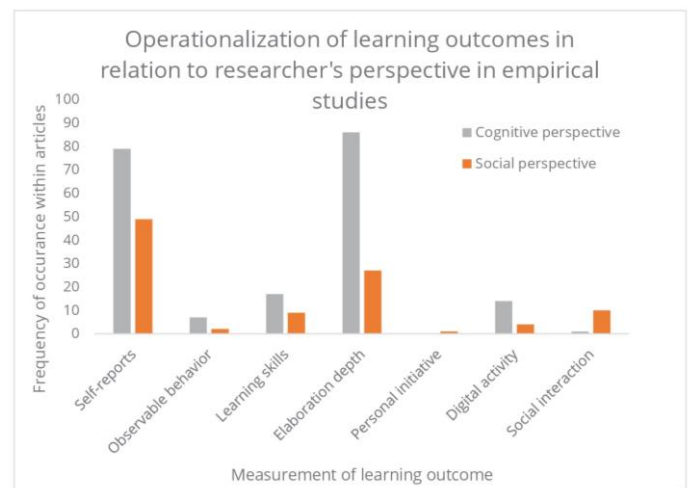
- ✓ peer reviewed journals
- ✓ publication year 2000-2017

#### Inclusion criteria screening

- ✓ quantitative method
- ✓ performance criteria is dependent variable
- ✓ targets groups are students in higher education
- ✓ learning process, instructional design
- ✓ use of digital media



### Differentiation of learning outcomes



Evaluation of learning outcome of individuals based on

- (1) **self-reports:** experience, perception or values of the learner
- (2) **Observable behavior:** actions and goal-orientated behavior of the learner
- (3) **Learning skills:** skills or meta-skills
- (4) **Elaboration depth:** cognitive measurements
- (5) **Personal initiative:** participation or pro-activeness in a digital learning environment
- (6) **Digital activity:** active usage of digital tools
- (7) **Social interaction:** the impact of social interaction on the learner

### Heterogeneous evaluation of learning outcome

We identified dependent variables and differentiated frequent practice of measuring learning outcomes. These measurements were categorized: self-reports and elaboration depth were captured most frequently while the least used measurements were personal initiative and social interaction. We present to what extent particular measurements of learning outcomes in higher education depend on the respective researchers' general theoretical perspective on learning with digital learning environments.

In future research we will discuss implications for a reliable transfer of scientific results into practice and investigate to what extent research should use categories that occur less frequent.