

Future learning and teaching: towards lasting effects of education on multiple dimensions

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Abstract

Teaching can foster both immediate and long-term, transferable competencies by combining cognitively activating instruction with motivational and emotional support, opportunities for practice and reflection, and connections to meaningful contexts. Instructional approaches need to be shaped to multiple needs of (individual) learners to enable learners to engage in sustainable learning. Research on learning and instruction investigates interaction of cognitive, motivational, emotional, and behavioral learner characteristics and processes and how instructional approaches can best support these interacting processes. By this, research on future learning and teaching contributes to learning settings which foster acquisition of future skills as well as well-being and health.

Background & Key Theories

Exemplary constructs:

- (Self-regulated) learning (e.g., monitoring, evaluation and control)
- Cognitive activation & Cognitive load
- Subject specific learning gain
- Motivation (e.g., scholastic values, self-efficacy, academic self-concept)
- Subjective well-being & loneliness

Exemplary theories:

- Self-regulation theory
- Theory of negative knowledge
- Expectancy-value theory and control-value theory
- Self-determination theory

Overarching Research Questions

1. How can instruction be designed to promote not just short-term learning gains, but also enduring, transferable skills across cognitive, motivational, and behavioral domains?
2. How can schools and lessons be structured so that students not only achieve optimal learning outcomes but also experience a sense of well-being?
3. How do cognitive, motivational, and emotional learner characteristics and processes interact?
4. How can students regulate cognitive, motivational and emotional processes of learning and how can teachers and technology support students?

Prominent Methodological Approaches

- (Field) intervention studies with Randomized Controlled Trial-design
- School-based cross-sectional and longitudinal survey studies
- Experimental studies
- Large-scale assessments
- Qualitative studies
- Mixed method studies
 - Eye tracking studies
 - Video studies

Social Relevance

Understanding and promoting longterm development in motivation, academic performance, social and emotional competencies, loneliness and subjective well-being among adolescents and young adults is an important factor for positive development, *both for individuals and society as a whole*. Research on learning and instruction and its longterm effects contributes explicit on UNESCO SDG 4 Quality Education as well on SDG 1, 3, 5, 10 and others. Further research on quality education is a indispensable pillar of a functioning democracy.

Examples of Related Research Projects and Networks

- Project MindOut Evaluation and project MindOut Startchancen schools in NRW
- Loneliness and subjective well-being among adolescents and young adults (Glück study)
- WKF (Wissenschaftliches Kompetenzfeld): Interdisciplinary research on key educational challenges (heterogeneity, digitalization, inclusion, democracy education) to study educational inequalities and support the development of young people's potential
- Research on learning, development, and educational outcomes under individual, social, and institutional conditions, including large-scale educational monitoring (e.g., IGLU, NEPS)
- DFG research group "Academic learning and study success in the entry phase of science and technology study programs" (ALSTER)
- Scientific network "Self-regulated learning in digitized schools" (SeReLiDiS)
- ROChET - Research in Organic Chemistry Education and Teaching – Network



Future Perspectives

Future directions in education should move beyond a sole focus on academic achievement and instead recognize students' subjective well-being and mental health as central outcomes. Educational institutions have a distinctive opportunity to promote these aspects by adopting approaches that strengthen motivation, socio-emotional competencies, and supportive social interactions. Prioritizing motivational and socio-emotional factors can increase student engagement while fostering more enduring and comprehensive learning experiences. Ultimately, this broader perspective enables education to have long-term impacts across various domains.

Key Literature

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