



Universität für Weiterbildung Krems.



The Teacher Innovation Laboratory

Integrating digital Innovation in schools
through teacher training programs

Univ.-Prof. Dr. Tobias Ley
17.05.2022

Gewünschter Schwerpunkt INTERREG Europe Projekt „Next2Met“ / WITENO

*Mit Blick auf den Transfer in die Bildungswissenschaften -
was in der Aus-/ und Weiterbildung funktioniert hat stets
das Potential neue Erfahrungsräume in den
Fachwissenschaften der allgemeinbildenden Schulen und
den Universitäten aufzuschließen.*

Haridusuuenduse koosloome Eesti koolidega

Koosloomel põhinevad meetodid haridusuuringute ja praktika sidumiseks
Õpianalüütika lahendused õppeprotsessi jälgimiseks ja analüüsimiseks

★ Designing for Digital Innovation at School

★ CEITER Project
2016-2020

★ Estonian State Award for Research in 2020

<http://edulabs.ee>

<http://ceiter.tlu.ee>



Robomatematika

Robotitega toetatud matemaatikaõpe põhikoolis, mõju õpilaste motivatsioonile ja haaratusele



Tark koolimaja

Värkvõrgu võimaluste kasutamine õppetöös selleks, et äratada õpilastes huvi tehnika ja tehnoloogia vastu



Digimatematika

Uuenduslikud tunnistsenaariumid keskkooli matemaatika digiõppevara rakendamiseks



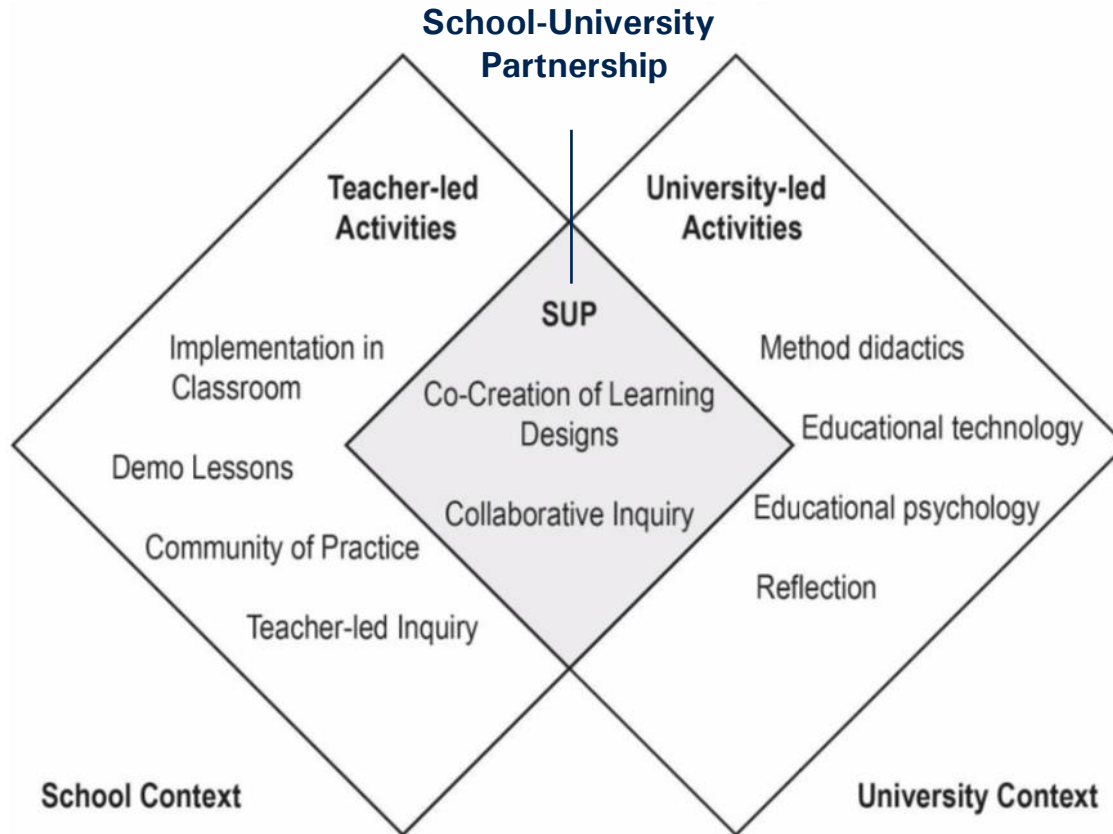
Mobiilne õuesõpe

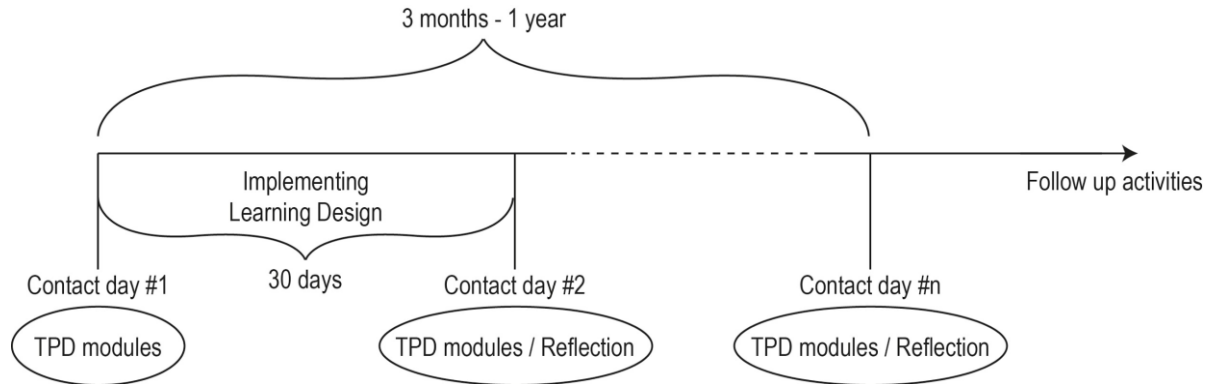
Õuesõppe stsenaariumid loodusainete õppimiseks sensorite, robotikaseadmete ning mobiilirakendustele loodud terviklahenduste abil

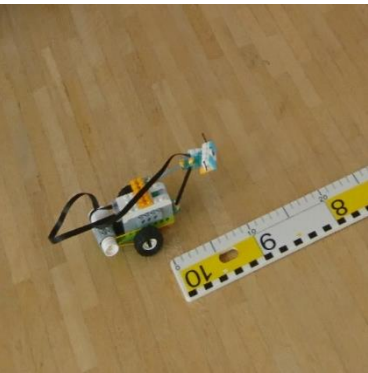
The Teacher Innovation Laboratory

- ★ Long-term Teacher In-Service Training (6-12 Months)
- ★ Design of new teaching and learning methods for schools
- ★ Collaborative Creation of “Learning Designs”
 - Lessons Plans, Interactive Learning Materials
- ★ Application in own teaching at school, “Teacher Inquiry” and reflection
- ★ Over 150 teachers participated









Robomath – 21 teachers

- ★ Aim of the training: to provide participants with a collaborative training environment that would facilitate adoption of the Robomath method in the basic education grades 3 and 6
- ★ 6 training days (ca once a month) at the university + collaborative and individual work independently to implement LDs and collect evidences. Period: 9 months
- ★ Co-creation: Learning Designs, student work sheets
- ★ Materials made available for the wider teachers' community in eSchoolbag

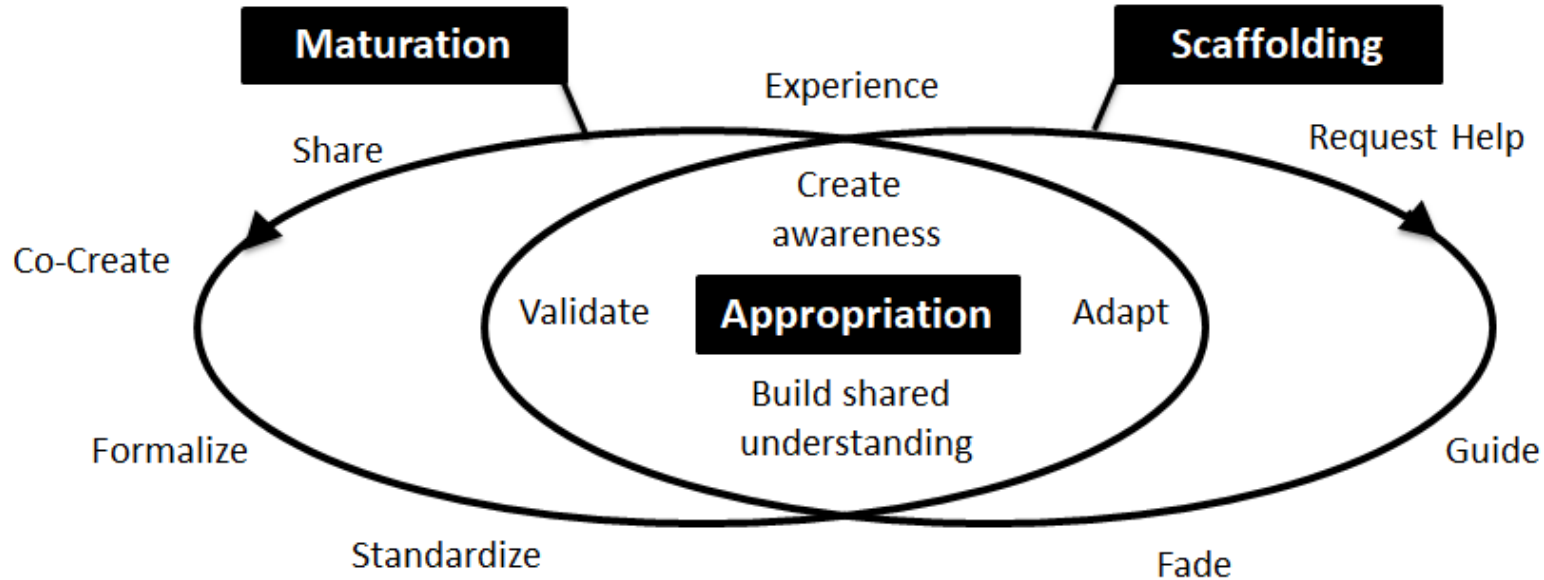
Knowledge Appropriation in Professional Learning

- **Socio-cultural theory** (Rogoff 1995) (Lave & Wenger 1991) (Billet 2002)
- Cultural practices are created in a community
- Role of tools and artefacts
- Individual learning integrated into cultural development
- Cultural tools (“cognitive tools”) become critical for cognitive development

Learning: Individual and Collective Agency

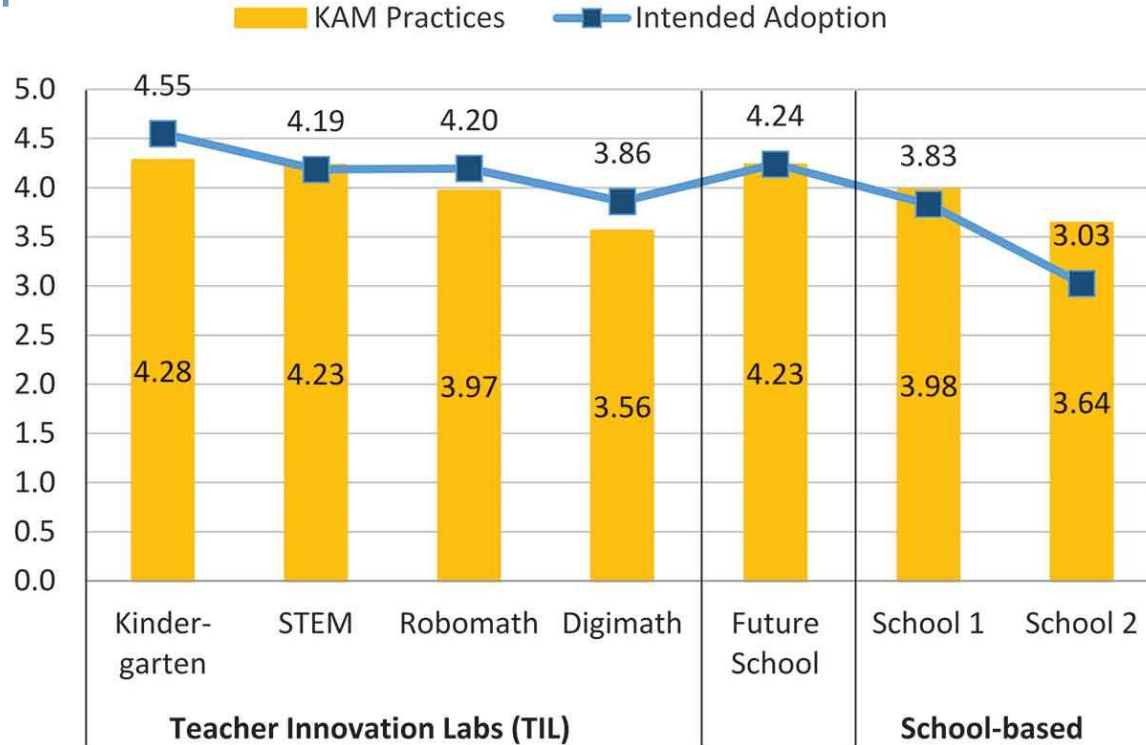
- Collective Agency
 - Knowledge Creation Theory (Paavola & Hakkarainen 2014)
& Knowledge Maturation Model (Mayer & Schmidt 2014)
- Individual Agency
 - Scaffolding in Informal Workplace Learning
(Twidale 2005; Tammets et al. 2013)

Knowledge Appropriation Model

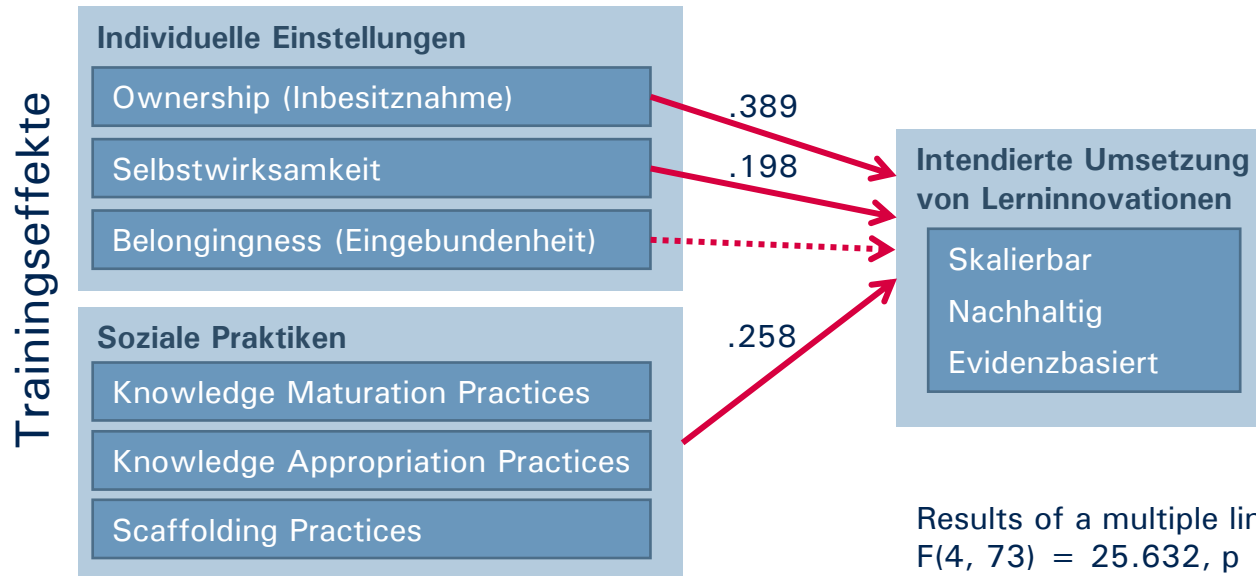


Wissensappropriation und Umsetzung

- ★ Soziale Praktiken während des Trainings korrelieren mit intendierter Umsetzung
- ★ TIL erhöht die Bereitschaft Innovationen umzusetzen



Welche Trainingseffekte tragen zur Intendierten Umsetzung bei?



Results of a multiple linear regression model
 $F(4, 73) = 25.632, p < .001.$
 $R^2 = 0.584$

Collaborative Creation is key!

- ★ Technologies don't determine
- ★ **Collaborative Creation leads to**
 - Integrated knowledge of technology, pedagogy and content
 - Increased ownership, self-efficacy and intended adoption
 - Leads to an appropriation of knowledge and integration into practices





EDULAB

<https://edulabs.ee/>

Inventing



Investigating



Scaling



Sustaining

**Phase
0**

Co-creation in Research Projects

Teachers involved
in early research

**Phase
1**

CEI Project Days

Open days for local schools
Testing new teaching
methods and new research
instruments

**Phase
2**

Innovation Laboratory

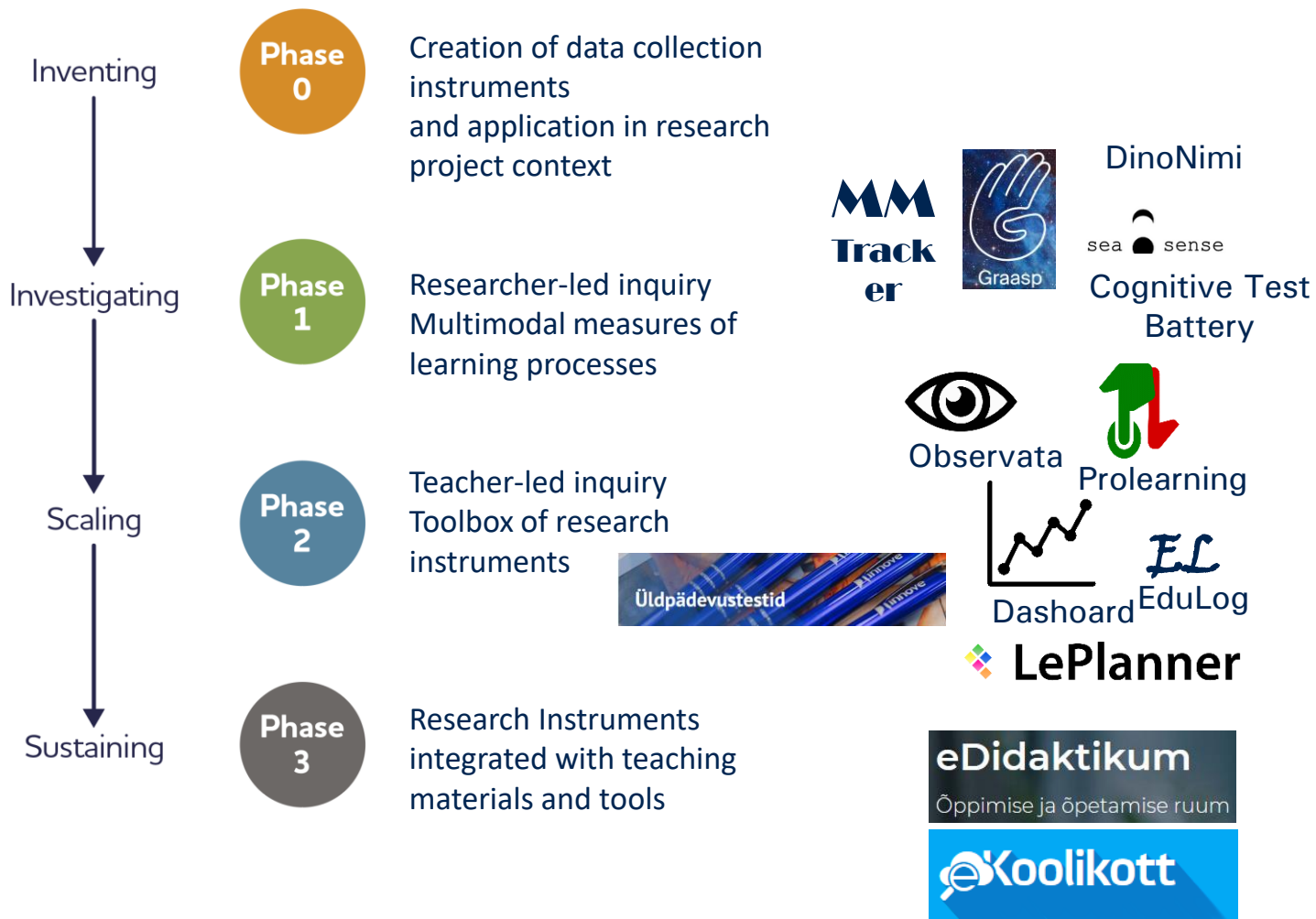
In-Service Teacher Training
Teachers as Researchers
Teachers co-create Lesson
Materials

**Phase
3**

Innovation Community & Digital Learning Resources

eDidaktikum
Interactive Digital Materials
and tests

The Learning Analytics Toolbox: Methods and tools for data collection



Inventing

Phase 0

Creation of data collection instruments and application in research project context



DinoNimi



Cognitive Test Battery

Investigating

Phase 1

Researcher-led inquiry
Multimodal measures of learning processes



Observata

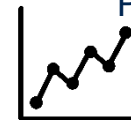


Prolearning

Scaling

Phase 2

Teacher-led inquiry
Toolbox of research instruments



Dashboard



EduLog

LePlanner

Sustaining

Phase 3

Research Instruments integrated with teaching materials and tools



Univ.Prof. Tobias Ley

Zentrum für Digitalisierung im
Lebensbegleitenden Lernen

tobias.ley@donau-uni.ac.at

Twitter @tobold