

EDUlabs

Co-creating Educational Innovations with Estonian Schools

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Executive Summary

This article introduces the EDUlabs method as a new way to co-create, introduce and scale educational innovations in the Estonian school system. We have built several EDUlabs around new teaching and learning methods in STEM and are researching the effect of these interventions on student learning. The method is tightly integrated with new teacher training methods and promotes teacher-led research. This article gives an overview of the EDUlab method.

The challenge of introducing Innovations in Education

The Estonian Lifelong Learning Strategy calls for a change in the approach to teaching and learning. However, our experience shows that introducing Innovation into the school system is difficult. This is not only a characteristic of the Estonian school system, but it can be observed everywhere in the world.

For example, curricula reforms are decided without taking sufficient care of including teachers into the change process, or the newest technology is bought for schools without consideration of how teaching and learning would benefit. On the other hand, there are innovative teachers, or research projects that suggest innovative methods, but a wider uptake is often not realized.

For us, an educational innovation is a change in teaching and learning practices that is evidence-based, sustainable and scalable. In the last two years, we have gathered a team of international and national researchers on educational innovation, didactics, teacher training, educational technology and educational psychology, to find a new way of how to be more successful of introducing these kinds of innovations in schools more broadly.

The result is **EDUlabs**, a systematic method to build innovation partnerships between research and practice in education in Estonia. By drawing on Living Labs methods popular in many domains and co-creation methods, we build learning and innovation communities in which teachers, researchers and other stakeholders continuously interact to promote and inquire into educational innovation.

These communities are common context where

- Innovative teaching and learning methods can be developed, tested and spread throughout the educational system
- Professional teacher education can happen, and
- Research about the innovation can take place to build a strong evidence base about the innovation

Four EDUlabs pilots in STEM learning

We have tested and demonstrated the feasibility of the method by showcasing four EDUlab cases that have started in 2017 and are currently ongoing:

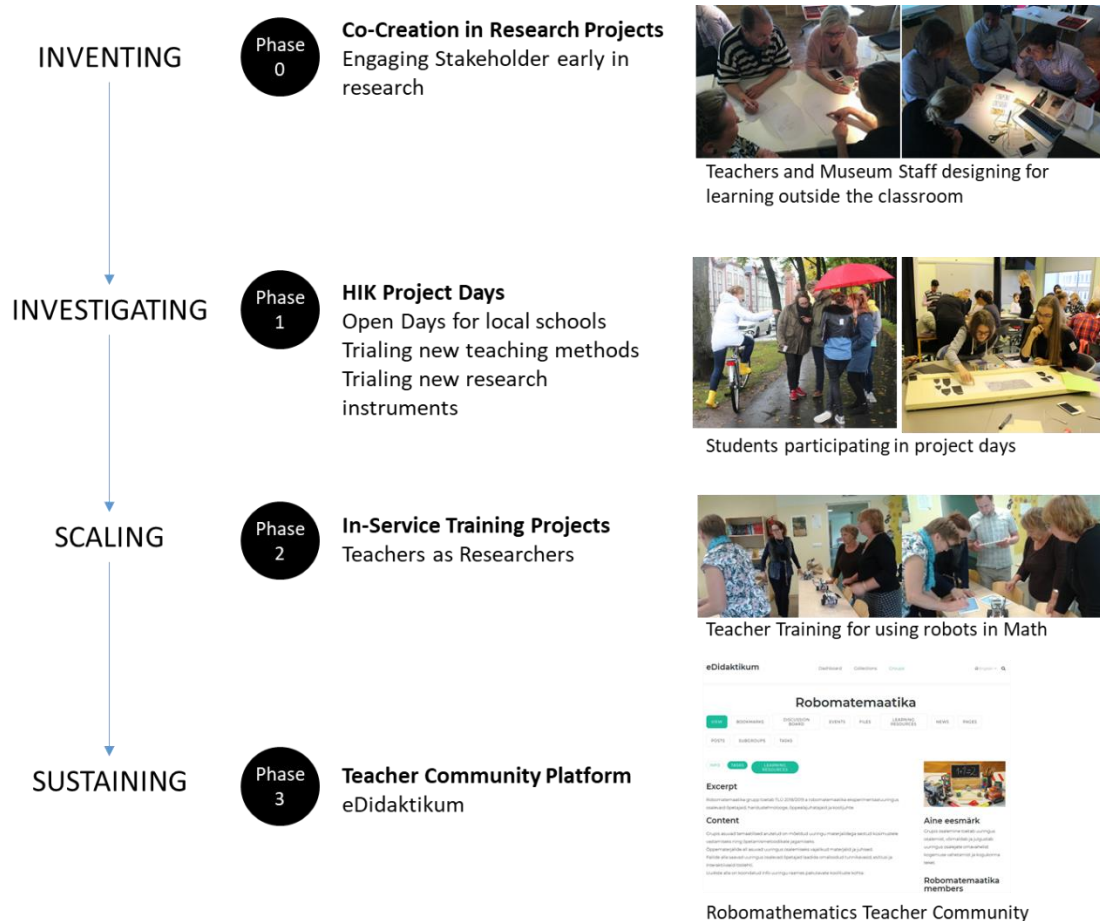
1. Robomath: Integrating Robotics in Math Education
2. Outside the classroom Science Education using mobile technology
3. Smart Sensors in STEM teaching
4. Pedagogically-innovative digital learning resources for Math and History

The pilots all integrate a set of current technologies into teaching and learning (such as robots or sensors). But rather than focusing on these technologies, the EDUlab model we propose builds effective pedagogical scenarios together with teachers that encourage new teaching and learning practices in the classroom. We are also studying the effectiveness of these new methods in practice in terms of several student outcomes.

At the current time, over 100 schools, over 300 teachers and more than 3000 primary and secondary school children have participated in the cases. If successful, we intend to propose this model as a general model for teacher training, educational research and innovation in Estonia.

Building EDUlabs with an incubation model

The EDUlabs method is an incubation model to spark innovation. It foresees 3 phases, each of which further develops knowledge created in the previous phase, and systematically builds up complexity and scale. The first phase uses established formats of innovation project days offered at the university premises for teachers and their classes. The second phase offers in-service training projects for interested teachers in the form of innovations laboratories. In the third stage a sustainable learning and innovation community is created.



Researching and building evidence

Each EDUlab conducts research as an integral part of its operation, and educational researchers are tightly involved. The purpose is to scale up research in such a way that evidence can be gathered across a larger number of classrooms, as well as to gain an understanding of the learning processes and effects on students. For this purpose, the EDUlab method includes a number of research instruments that can be used for practice-based or lab-based educational research. Examples of these instruments are student feedback instruments for classroom use, observation tools, questionnaires and automated sensor-based tools. All instruments are optimized for use in the EDUlab phases. The tools are put together into a toolbox that should facilitate the use of teachers themselves. Following new conceptions of teacher-led research, the tools also allow teachers to research and reflect their own practice as a central mechanism of their professional development.