

Designing Edukata: a method for educators to create learner centered activities

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Edukata is a collaborative design method for teachers and educators. It is based on an academic practice-based design research method that has been successfully used in designing various learning tools. The method produces high quality Learning Activities that have been empirically validated in over 2500 European classrooms using teacher surveys, observation, video diaries and interviews. Evaluation shows that Learning Activities increase student motivation, strengthen 21st century skills, encourage teachers to use novel technology to support their teaching, and connect their classrooms to society. This paper presents the history of Edukata, the empirical results showing Learning Activity efficacy, and discusses the key features that allow it to change classroom practices.

Introduction

A lot of curricular requirements in European classrooms are handed to teachers top down. This is an obvious hindrance to teacher-lead innovation. We in the Learning Environments research group at the Media Lab of Aalto University (previously University of Art and Design Helsinki) see a need to encourage teachers in being active creators and designers of their educational practices.

We have empirical evidence that well designed Learning Activities following a certain template are valuable tools for teachers to challenge their own established practices and to try out new methods and tools. We can also show that these experiments by teachers provide significant improvements in the students' working culture, engagement, motivation, and ultimately learning outcomes. Evaluations from over 2500 classroom pilots have clearly indicated that the Learning Activities we have designed are surprisingly effective at enthusing teachers and students, affecting change in classroom practices, and prompting other teachers to adopt similar practices. (European Schoolnet, 2011).

Our research question is:

What amount of support, training, materials, and experience is enough to allow teachers to create their own Learning Activities that produce equally beneficial results in classrooms?

Our hypothesis is Edukata, a set of guidelines targeted for teachers to help them better design, reformulate, and change their teaching practices. Edukata is based on the group's design-research approach, "Software as hypothesis" (Leinonen, Toikkanen, Silfvast, 2008).

This design-research approach has been used and is continually being developed by the research group since 1997. The group is multi-disciplinary, consisting of service designers, graphic designers, educators, engineers, psychologists and cognitive scientists. The method has been used successfully to design and implement software prototypes for reflection, knowledge building, and OER authoring, as well as physical environments, future scenarios, and educational practices (see e.g. Leinonen, Kligyte, Toikkanen, Pietarila, and Dean, 2003; Ford and Leinonen, 2009; Toikkanen, Purma, Leinonen, 2010; Keune and Leinonen, 2013; Durall and Toikkanen, 2013).

Our philosophy on **tool design** draws heavily on Engeström's activity theory, emphasizing that a tool, beyond being invisible and fit for a specific use, should provide the actors with new abilities to act openly with objects around them. The tool should be able to affect the system around it, and be affected and modified by it. (Leinonen, 2010).

Our philosophy on **service design** draws from Rittel's (1972) view that each challenge can have multiple solutions, and attempts to solve challenges will often create new more complex problems. But to differentiate from problem-based approaches, we emphasize that design should always try to create a positive addition to the present state, not just reactively solve problems as they emerge. We acknowledge Schön's (1987) view on *artistry*, meaning the way designers combine their domain understanding and design expertise with intuition, often leading to surprising results, which cannot be logically tracked back to the starting point. We also agree with Nelson and Stolterman (2003) in that designer's actions are intentional contributions to the situation and the designer is an active participant in the change process. The designer's intentions, as schematized by Nelson and Stolterman (2003) are:

1. Helping (fixing, assisting, patronizing)
2. Art (persuading, influencing, manipulating, proselytizing)
3. Science (describing, explaining, predicting, controlling)
4. Service (serving, conspiring, emphatizing)

Of these four designer intentions, our group's method focuses more strongly on service intentions (Leinonen, 2010).

Our philosophy on **participatory design** stems from the work of Pelle Ehn in the 1980s and the Scandinavian design practice that emerged henceforth. Following the principles of Ehn and Kyng (1987), we see the people for which design is being made as a primary innovation source. The designer needs to spend time with the people in question and learn about their everyday life situations, instead of doing laboratory experiments (Leinonen, 2010). We fully acknowledge that design challenges and their solutions are highly context-specific (Muller and Kuhn, 1993).

These basis for our work stem from decades past, but are still relevant. They are in fact being rediscovered in more recent user-centered and human-centered design approaches (Gulliksen et al., 2003; Schuler & Clement, 2004). These newer methods are moving beyond just usability testing and acknowledging the human activity systems and the cultural context where the design result will be used.

In terms of **learning design**, we see that most LD approaches fail to cover the complexity and messiness of teaching and education (see eg. Conole, 2010), and often restrict teachers, rather than empower them. Our research method, and indeed Edukata, steer away from connections to such patterns, leaving many details open for teachers to fill out as they see best. We

acknowledge that this makes comparison and benchmarking rather difficult with the huge variety of approaches and results, but feel this space for innovation is critical.

From Design Research to Edukata

The EU funded project, iTEC, ran from 2010 to 2014. Our group's mission was to receive future learning scenarios and design practical prototypes for a wide European pilot. The project was organized to go through 5 piloting cycles. Over 2500 classroom pilots were realized during the project in total.

Our design process consisted of our team using professional design working methods to analyse scenarios and to engage with teachers and students across Europe in various ways. Some of the ways in which we facilitated participation in this process were:

1. Sending the scenarios to each piloting country for a facilitated discussion with a local coordinator and a group of teachers. Discussions were audio recorded and an English summary was written by the coordinator and passed on to us.
2. Recruiting groups of advanced teachers to pre-pilot our designs. At this stage, our designs were still a bit unpolished, so we preferred teachers with interests in less direct teaching and with fluent ICT skills.
3. Inviting teachers, headmaster, educational researchers, and students to visit our lab, show them our prototypes and ideas and engage in dialogue.
4. Visiting local schools to observe and converse.
5. Organizing focus group sessions in different European countries, including Italy, Austria, Germany, Finland and the UK to which teachers and students are invited to comment on the design outputs and ideas.
6. Facilitating online Focus Group sessions with teachers and students using synchronous video conferencing tools. We recruited these participating teachers and students through the iTEC social media group, which has since grown to include over 1500 members. The teachers who joined these sessions were of diverse national backgrounds.

During the first cycle, our design work unearthed many surprises to ourselves and to other experts in the project. The specific design challenges and opportunities are reported in the first yearly report (Keune, Toikkanen, Purma, and Leinonen, 2011). As an example, the scenario developers took teamwork as a granted, but in participatory design sessions we discovered that in most European countries, teamwork in schools is nonexistent, and teachers saw a real challenge in monitoring several teams instead of the entire class as a unit. To answer this specific challenge, we created a web-based digital tool TeamUp¹ that helps teachers form functioning teams and to follow their progress very rapidly and easily.

We quickly saw that a technical prototype, even with proper documentation and training, is not enough to achieve change in classrooms. Teachers need to create their own course plans, where they figure out how they prepare for these more advanced activities, how they introduce them, coach the students, and finally assess results properly. To do this planning, they needed

¹ <http://teamup.aalto.fi>

the salient aspects and key concepts of the scenarios to be represented more concretely, including practical tips and common mistakes to avoid. This would support the teachers in understanding which ways of teaching and use of tools would be new to them and how these could be tried and appropriated to meaningfully support the mediation of learning at classroom level.

As the scenarios we were working with contained similarities, instead of writing one concrete learning story for each scenario, we had to devise a more modular approach. We ended up writing most details into Learning Activities (LA). Each LA contains one aspect of one or more scenarios, and the key concepts were captured by the set of LAs. Each LA describes a way of working in an educational setting, in a scope larger than a single task, but smaller than a lesson or a course. The term “learning activity” has been loosely used in various meaning, but we chose this term as it is generally familiar to teachers, and common interpretations are not far from what we intended a LA to be.

A typical example LA from cycle 1 is “Collecting data outside of school”, which calls for students to do data gathering in small teams outside of classrooms. The activity can span many lessons and typically raises different challenges in different European countries based on current educational practices and conventions. Each Learning Activity details ways to motivate students and teachers, offers tips for technology use, and provides tips and guidelines for preparation, introduction, implementation, and assessment.

In cycle 1, we developed 13 Learning Activities and 6 Learning Stories which are example narratives of how a set of Learning Activities would look like, when used together. Learning Activities created by our team have been used by teachers in real classroom pilots in over 2500 course implementation across 16 European countries. Detailed evaluation results are published in European Schoolnet (2013). Figure 1 highlights some of the findings.

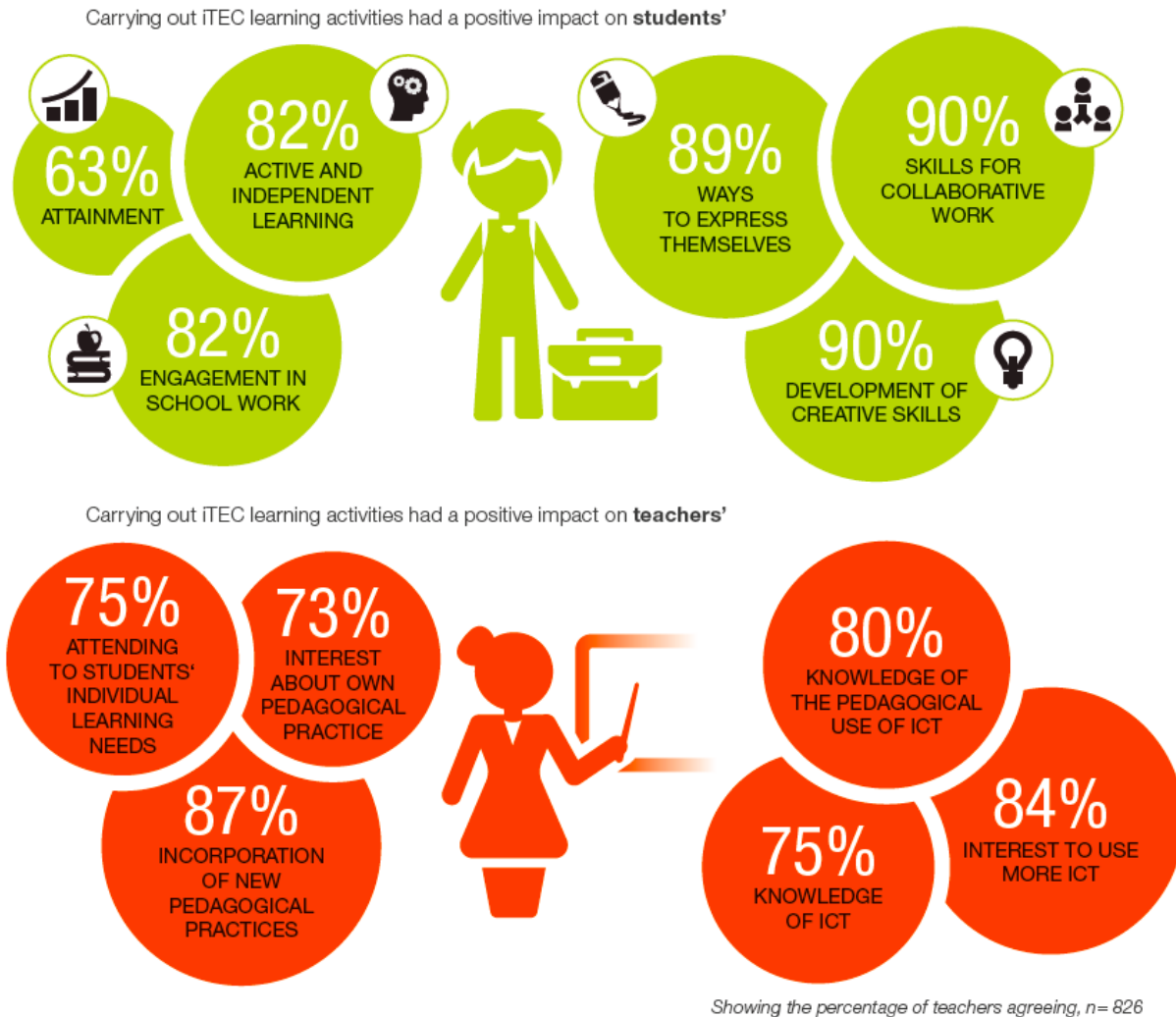


Figure 1: Summary of key findings from ITEC classroom pilots that used Learning Activities as the main guiding structures of primary school courses around 16 European countries. Source: European Schoolnet, 2013.

After two years of piloting, the annual review highlighted the Learning Activities and the design process used to create the same as one key achievement of the entire project. Our goal for the final cycle was changed: instead of a fifth repetition of the same process, our goal became to turn our design process into a set of guiding principles that teachers could continue to use even after ITEC ends to develop their own Learning Activities, based on their particular classroom context.

This was not an easy task. When we have multidisciplinary professionals working on a set of scenarios on and off for two months, how can the same results be achieved by teachers, while they are teaching? This question is still, in part, not answered.

We named our adapted and simplified set of guidelines "Edukata". The presentation of these guidelines has gone through three complete revisions so far, and we have just completed our

final iteration, which will be translated to numerous European languages and will be disseminated as a key output of the iTEC project. Edukata consists of online materials, a printed facilitator handbook, some individual tools, and facilitator training workshops. It is clear that some training is needed to become a proficient facilitator of this participatory design approach, but how much is needed, and what the quality range of Edukata outputs is going to be, remains to be seen.

Design results: Description of Edukata

Edukata is a set of guiding principles for designing context specific Learning Activities. The Edukata process consists of two types of sessions: *working with core team* and *working with participants*. These sessions are performed iteratively and each iteration propels the process onwards from an inspiring scenario to carefully designed learning activities. During a typical *core team* session, teachers gather together to discuss what to do next, analyze results, and proceed using various group working techniques. Inspirational work happens during the *participant* sessions. These sessions happen usually one after the other, with 3-8 sessions in total being a common duration. The Edukata process can be short or long, depending on the scope of the challenge and the goals of the design work.

The details of each session, as well as practical tips, are published as a final outcome of the iTEC project². These guidelines have been rewritten three times. Each iteration has been exposed to teachers in focus groups, classroom pilots, and workshops, to gain a better understanding to our main research question. Edukata as a set of guidelines has been simplified radically from the theory-heavy design-research method from which it is distilled.

Experiences on Edukata

Edukata as a teacher tool has been generally received positively. We have ourselves organized two teacher and headmaster workshops, one in Denmark and one in Finland. Anecdotal feedback from the workshops has shown that participants were inspired and saw great potential and practical value in the Edukata sessions and the ways of working that the guidelines point to.

The coordinator of the iTEC project, European Schoolnet, has even created an online course, Future Classroom Scenarios, where Edukata is included as part of a larger school change management process. Their first MOOC implementation had over 1500 participants as it started in March 2014³.

It is still unclear how much training, support, and experience a teacher needs to facilitate an Edukata process that will produce as good Learning Activities as have been piloted in iTEC. Our current research question is still unanswered, but we hope to have results later in 2014. These results can be found online at edukata.fi.

2 see <http://itec.eun.org> or <http://edukata.fi>

3 <http://www.europeanschoolnetacademy.eu/web/future-classroom-scenarios>

Discussion and future work

The need for teacher collaboration and support for it is a clear need in most European countries and schools. Learning Activities have been empirically shown to be a working template and medium for sharing tips for challenging, new teaching approaches and ICT use, which produce significant and lasting change in teaching practices and educational outcomes.

What remains to be seen is whether these good quality Learning Activities can be consistently produced by a team of educators, when facilitated by a peer that has received some training on the use of Edukata. First results are expected during the first half of 2014.

Edukata dissemination continues in the forms of facilitator workshops and academic publications. We will follow closely the results of the first properly trained facilitators, and based on the results will further refine the guidelines.

There are potential benefits in just encouraging teacher to collaborate. It is unclear which aspects of participatory design (power distribution, timescale, decision making on agenda, etc.) should be leveraged more than the others in these workshops to support them in strengthening their standing and acting power within their institutional spaces.

PD can be an inspiring approach to developing learning activities that are contextual and based on the students' needs, but how can such practices be sustained at a more fundamental level within schools? In the course of taking this work forward, we are revising the Edukata guidebook and are developing training models that we are intending to further trial and develop with the community of teachers that the iTEC project has created.

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