

Final external evaluation report to the QUEST project

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External evaluation summary

In the following, I summarise the main aspects concerning the external evaluation of the QUEST-project. I list findings indicating the success of QUEST and factors that have contributed. At the end, I briefly describe what more can be done to help innovation projects in education to improve teaching to an even higher degree.

The project delivered a long-term teacher professional development model of high quality to the participating municipalities. It succeeded in establishing working structures including municipal consultants, school leaders, teachers, and the project staff from Aarhus University and VIA University College. Disturbances of these structures occurring during the project period (i.e. people moving to other positions, a labour dispute, and new national working regulations for teachers) were resolved through intensive dialogue between the management team and the involved partners. At the end of the year 2015, these structures were functional in all municipalities and plans for continuing activities in 2016 in place.

Most of the participating teachers evaluated the course days of the QUEST-modules positively. Especially the QUEST-rhythm became highly appreciated. Following that rhythm in the modules, the teachers acquired new knowledge, informed their colleagues at their schools, tried out new teaching approaches, and exchanged and discussed their experiences again with other course participants. Encouraged by QUEST, subject teacher groups were established in schools that did not have one. The agendas of these meetings were gradually shifted from organisational issues over to teaching related topics making the meetings more meaningful for the teachers.

Observations in classrooms and teacher reports during network meetings showed that the teachers used the approaches and tools introduced by the modules in a systematic way. Often starting with a simple adoption of teaching activities, they later adapted them to classroom conditions and began to reflect upon student learning and its relation to aspects of the teaching. The notion of redesigning teaching sequences and the positive reception of the lesson-study method indicate improvements in the participants focus on quality in teaching and student learning.

There are numerous accounts from teachers who tried out ideas and tools from QUEST in their classroom that students reacted positively and often became engaged in intensive learning processes. There are also accounts of improved learning outcomes from teacher reports. A comparison of student performance in QUEST and non-QUEST schools using the results from national exams including the years 2012-2014 found no differences. Given the short duration of QUEST, a significant difference on the school level could not be expected. There are, however, preliminary findings indicating that QUEST schools which are described as developing especially well by the indicators used in the project show improvements compared to QUEST schools scoring lower on these measures.

Concerning efforts to sustain the use of QUEST ideas beyond the project period, it was achieved that all participating municipalities took over the responsibility to secure the working structures (coordination, subject teacher groups, and teacher networks). They

organised and conducted the work in the last project year largely independent from the project management and are committed to continue the work also in 2016 and beyond with the QUEST schools and new ones. In some of the municipalities, QUEST inspired initiatives using some of the ideas on a broader basis in order to further develop all schools within the municipality. These initiatives can be regarded as steps towards an institutionalisation of the teacher professional development approach designed and implemented by QUEST. At the current point in time and with the available information about these initiatives, it is not possible to say how far this institutionalisation might reach in the future. Actually, there is one aspect that might hamper the functioning of these initiatives namely that they are linked to a formal requirement of teaching competence for teachers introduced by the government in 2014. Teachers working towards a formal qualification might possibly individualise the originally collaborative approach from QUEST.

One important reason for the success of QUEST, if not the most important one besides a research-based professional development model, is the combination of mainly formative evaluation research and a management that took the research results seriously. The observations at various levels (subject teacher group, teacher network, and classroom) yielded hints at problematic aspects that could interfere with the project goals. The project team became itself a professional learning community adapting and improving plans to municipal differences and unforeseen occurrences. The knowledge about the processes was communicated to the other project partners in order to make them aware of possible challenges and to find solutions securing or enhancing the impact of QUEST.

All this shows that QUEST succeeded in implementing a collaborative development model of science instruction in Denmark. The model is well accepted by teachers and recognised as an exemplary model of school development. Research conducted in QUEST has evidenced that teachers use ideas and tools introduced by the project on a broad and increasingly regular basis. There are indications of teachers becoming more and more aware of the importance of reflection on teaching quality if their students are supposed to improve. Last but not least, there are indications of a continuation of that model in the participating municipalities that hopefully will lead to a stable institutionalisation.

Despite all these positive and promising findings, there are many questions still open. This seems to be due to the current model of project funding where neither the long-term consequences of innovations nor an institutionalisation of beneficial practices are usually taken into account. This is mainly a political issue, but also funding organisations like the Lundbeck foundation can play a role. I see two possibilities for funding agencies to promote a change. First, they can provide funding for follow-up studies documenting whether the effects of a finished project persist, increase, or wither. This knowledge will help to clarify conditions of successful long-term school development especially with regard to the classroom and student level. A second and maybe even more beneficial approach can be to sustain school development initiatives like QUEST in a number of well-working schools in order to develop them to exemplary schools which are clearly distinguishable from other schools. This would reduce the danger of running one innovation project after the other without really achieving the possible outcomes because resources were used for new ideas.

Introduction

This is the last evaluation report to the QUEST-project. It will briefly look at activities in the last year of the project and then focus on the relation between what the project set out to achieve and what it actually achieved. This reflection is concluded by my thoughts about what the experiences from QUEST together with experiences from similar projects tell us about implementing changes in an education system that last beyond the project. Especially the last part of the report is moving away from the project in order to develop views that can be used to design even more powerful approaches. The ideas are mostly not evidenced in a scientific sense, but should rather be regarded as hypotheses that have to stand the test.

Main information sources regarding project activities are written notes from meetings in the municipal school networks and between coordinators and project team, and talks to members of the project team at various occasions.

Activities in 2015

Activities in 2015 aimed at passing responsibility for the work in the teacher networks to the municipalities and compile information in a way that secures the passing on of the ideas in QUEST. That involved support in building and stabilising the leadership in the municipalities through meetings and communication with the municipal coordinators and others involved in the leader teams. It also involved participation in the network meetings that were run under the full responsibility of the individual municipality and giving some content related input when wished for.

Disseminating QUEST-ideas was affected by the school reform introduced in 2014. The reform included changes in the working conditions for teachers, new requirements for subject qualifications in Danish and mathematics, and structural reforms at the municipal level. Before the reform, a number of municipalities not partaking in QUEST expressed interest in trying a QUEST-like model in connection with in-service education of their science teachers. However, the sudden political prominence of Danish and mathematics caused them to move recourses away from science teacher education. The decision of the project management to develop an in-service education model which is not specific for science, but can be used in connection with in-service education in any school subject (Q-model) was prompted by this unforeseen shift.

Another important activity was the further development of the five booklets concerning the central topics during the first phase of QUEST. The draft texts were finished and every booklet was tried out with a school that had not taken part in QUEST in order to check whether it was clear enough for use by schools without experience from the project. In order to support the distribution of ideas from QUEST better, the project homepage underwent a major redesign. From being a description of what QUEST was and did, it became more “communicative” showing others how teacher professional development projects in Denmark could be designed differently in order to make them more efficient using the Q-model.

The situation for the QUEST-schools in 2015 was affected by the school reform. Consequences were that schools were closed or merged with another school and teachers participating in QUEST became members of a school that was not enrolled in the project previously. For the teachers, the reforms resulted in more teaching hours and consequently less time for meeting e.g. in the subject teacher group. Because of differences in the actual organisational changes, that situation could have been used to document cases of how certain organisational changes impact on collaboration in teacher teams and between them. However, these changes were unforeseen and a scientific evaluation of the effects had not been planned for. In addition, consequences for individual teacher groups would have had to be tracked over a time way beyond 2015. The evaluation will therefore look at the activities in QUEST in 2015 in a broad sense without going into details.

Work done in the municipalities

All the municipalities have found their mode of continuing the work. The municipal coordination was confirmed and in some cases supplemented. The schools that were supposed to participate in the collaboration through the established network were identified and a schedule for network meetings set up. Between two and three meetings every half year were agreed upon. From memos it can be seen that the municipalities kept the QUEST-rhythm by assigning a task to the teachers that they had to conduct with fellow teachers at their schools between network meetings. Also a continuation concerning the topics that the municipalities worked with is visible (inquiry, linking curriculum goals and use of outside-of-school learning environments). There are also set up meeting plans for the municipal networks for spring 2016.

Municipal coordinators: leading the work in the past year and after QUEST

Meetings between the municipal coordinators and the project team (KK-meetings) were held on a regular basis in order to steer the project throughout the project period. The municipal coordinators functioned as the link between the project team from VIA and Aarhus University and the participating teachers playing a vital role in implementing the project plans and conducting the work in the schools and subject teacher networks. In the KK-meetings, project management, municipal coordinators and researchers addressed questions of steering the project together. They discussed results of actions and occurrences and agreed on the next steps to take. This collaborative approach to managing the project mirrors one of the main project principles and helped to establish and nurture ownership in the different participant groups in QUEST. In addition, the KK-meetings were a place for sharing experiences with running the project in the different municipalities. Especially challenging situations and their solutions stimulated the coordinators from the other municipalities to either prevent similar problems to emerge or to overcome such challenges faster. In order to facilitate the transition from QUEST-led activities to the individual projects in the municipalities, a set of guidelines for how to organise network meetings was discussed with the municipal coordinators and accepted by them.

In order to secure the positive effects of regular meetings between those who were supposed to lead the continuation of QUEST in the municipalities, the coordinators decided to establish a new form of such meetings. On October 1st 2015 this new network for municipal

coordinators was constituted under the name naturfagkoordinatorknetværk. The group has agreed on meeting four times a year, with two of the meetings taking place in connection with national meetings of the National Centre for Science, Technology and Health Education (ASTRA*). The agenda of the meetings should include two parts: one around organising the teacher networks and one about a topic to be shared with the teacher groups. The first regular meeting was arranged and held on December 17th.

Planned conference on school development following the Q-model

In the course of 2015, plans were made to host a conference at the end of the year intended to strengthen the work initiated by QUEST and to transfer it to other school subjects. Based on the experiences from QUEST, a model for a school-based competency development was developed (Q-model). This model is suited for tackling new demands in the light of recent school reform initiatives and suggests establishing subject teacher groups (for example in mathematics and Danish, the focus subjects of the reforms) and enrolling them in the improvement of the quality of teaching. A number of 5 to 10 schools should form a network to allow adopting the QUEST-rhythm, being introduced to new approaches to teaching and helpful tools, trying them out at the individual school, and reflecting over experiences with teachers from other schools.

An invitation to school leaders and others involved in pedagogical development at schools participating in QUEST was sent out. The conference had to be postponed once and eventually cancelled because of a lack of relevant participants willing to come. The fact that QUEST schools were addressed implies that the school leaders knew about the project. The apparent lack of interest in the conference allows for several interpretations.

First, school leaders already know enough and do not see the need for more information. This may be plausible for those who have decided not to take further action, but also those who believe that the municipality has taken steps to do that. An example for the second case may be Aarhus where the local competency development initiative (KOPRA), reacting to new national requirements, is based on experiences from QUEST.

Second, school leaders may not regard developing subject teaching as their task, not as something they are responsible to lead, or at least not as a priority. They may be occupied by the day-to-day business of running the school and reacting to demands from administration and policy. In addition, new requirements, especially those on a national or municipal level, may be regarded as the responsibility of the respective administrative bodies. Hence, they may just wait for offers to help them follow the new rules.

A third interpretation is that the structure of the Q-model poses a challenge to getting involved. Following the consensus model for effective professional development and the experiences from QUEST, competency development in the Q-model is said to be “long and thin”, meaning that it goes over a long period of time (years) with a low intensity. At first sight, this may look advantageous because it does not consume many resources at a time. However, many people prefer to see outcomes of an activity very soon or to see formal requirements met and may therefore tend to more traditional forms of teacher professional

development. In politics, taking action and spending money to solve a problem is more important than the actual outcomes which only become visible when the public attention already has diminished. Also the information that to establish school development following the Q-model needs more resources in the beginning but less after the introduction phase may actually trigger negative associations: A relatively large input of resources in the initial phase with a prospect of outcomes showing slowly and late may seem risky. Teachers react similarly when recommended to use more time in the beginning of a new topic in order to secure a good understanding and thus prepare the basis for a more efficient further learning. They refuse arguing that they have to cover many other topics and therefore are forced to rush through accepting superficial learning of their students which is putting a growing threat to further learning.

Meeting with municipal coordinators in December

Instead of the cancelled conference with school leaders a last KK-meeting was scheduled. The purpose was to look back at what has been achieved in QUEST and also forward to what has been planned for 2016. The coordinators that were convening on December 10th expressed their satisfaction with what they had achieved during the project and that they felt they were on the right track. Two reported about reservations in teacher groups in the beginning of the project obviously due to the new and unfamiliar situation in a project like QUEST which were overcome after a short while. The coordinators reported to have found ways to address obstacles which they met. All seemed to be aware of the need of a broad anchoring in the organisation of the individual school and a close link to the subject teachers. The most noteworthy thing from my point of view was the positive mood in the group. At the end of a highly estimated project one would expect a dimmer mood, but the prospect of continuing for some time may be a good explanation for the reverse.

Status meeting at the Lundbeck foundation

A status meeting for the two projects ASTE (teacher education) and QUEST funded by the Lundbeck foundation was held on September 21st 2015. Participants from universities, university colleges, municipalities and ministries were gathered to learn about the project achievements and their meaning for the further development of schools for compulsory education. There was consensus that both projects evidenced that their concepts work improving respectively teacher education and teacher professional development.

Activities to transfer QUEST-ideas to other initiatives

There have been several initiatives to transfer ideas from QUEST into institutions involved in the professional development of teachers. A pilot for the further development of teacher educators was conducted at VIA. The course was based on some principles of QUEST including groups working together during the course and practical tasks where the newly acquired knowledge was applied. Participants gave a positive feedback. A second opportunity is under development with the leadership of Danish Science Gymnasiums (DASG). A working group with representatives from VIA and the universities in Aalborg and Copenhagen has been formed and will discuss an offer for further development of science teachers in upper secondary school based on the Q-model.

Research activities

Research activities in 2015 were first and foremost analysing the already collected data and writing papers for conferences and publication. One ongoing new branch is the analysis of performance data from national exams. Data from QUEST-schools are compared to other similar schools. Findings so far are preliminary and have to be extended with data from 2015. Analysing the data from year 2012 to 2014 no differences could be found between QUEST- and other comparable schools. Another analysis indicates that those schools in QUEST which were identified as changing most also improve their student performance to a greater extent than schools with less obvious changes.

Overall achievements in QUEST

QUEST has developed and successfully implemented a model for teacher professional development in five Danish municipalities. The model is based on consensus criteria for effective professional development including collaboration in subject teacher groups within the individual school, a long-term perspective over several years, a focus on teaching and learning related issues, inspiration from outside of the school, and opportunities for application of new knowledge in the own classroom. The project and the underlying ideas are known in Denmark and are regarded as exemplary and making a difference compared to traditional professional development courses. Publications in journals and books, conference talks, and direct personal contacts have contributed.

Overall, the participating teachers expressed satisfaction with the approach and emphasise especially the collaboration with fellow colleagues and the inspiring ideas and tools directed towards their teaching. The teachers wish for continuing to develop further in that way. Also the municipal coordinators who became central figures in the organisation of the project work are quite enthusiastic.

Results from research conducted in QUEST confirmed knowledge about collaborative development processes in teacher groups, but led also to insights into the details of change processes in education. The fact that research in QUEST was designed to focus closely on concrete aims in the project (subject teacher groups, networks and classroom practice) made it especially relevant for the management of QUEST (formative evaluation). Collecting data directly from teachers in their various project roles produced knowledge about the impact of activities and raised the awareness about relations between interventions and teacher behaviour. The researcher perspectives based on specific research knowledge were discussed regularly with the project management and the municipal coordinators leading to adjustments in the activities that helped improving project outcomes further.

Research on subject teacher groups indicated that groups were formed in schools where they had not been established before QUEST. Over time, a shift to more relevant activities for improving learning was observed in their regular meetings at the schools. In the beginning of QUEST, subject teacher groups were often concerned with administrative and organisational issues like cleaning up the science room or buying items needed. Through the tasks that colleagues brought back from the module courses, discussions about what to do in teaching

and experiences from trials became more prominent. The majority of teachers experienced the meetings in the groups as inspiring and beneficial for their further development. There were indications for a growing self-confidence of these teacher groups, and they started to ask the school leadership for the support and the resources that they needed for further improvement.

Monitoring the status of the municipal teacher networks showed that the number of schools having an established subject teacher team rose and that the networks advanced to higher levels (mostly from initiated to implemented). Although the main work for developing teaching is done in the subject teacher teams at the individual school and a functioning team is crucial, the bigger teacher networks across schools had an additional benefit. On the one hand, they were needed for planting ideas that should be taken up in the schools. On the other hand, they became important arenas for exchange and discussing experiences. The network meetings showed a broader diversity of activities than a single school could have conducted thus providing more inspiration. The fact that an approach that did not work in one school was possible in another helped ruling out that it was the approach that was unsuited and directed the focus on how the lesson activity could be conducted in order to make it work better.

Having courses with teachers from several schools helped the teachers to recognise external resource persons that they could use for inspiring their teaching. This included consultants in the municipality and on a national level, local and regional centres offering science-related content, people from the university and the university college, and teachers from other schools. The course structure with several meetings over a period of months provided for diverse and repeated opportunities to meet and discover common interests. As a consequence, the number of professional links between the participating teachers in QUEST rose and the importance of inspiration for improved teaching approaches from outside grew.

QUEST developed the content of the modules to be usable in classrooms and provided the opportunity to test resources during the course days. The project also urged the teachers to try out ideas in their classes and report the experiences in order to stimulate implementation and reflection. The case studies from classrooms, but also memos from network meetings, showed that many teachers quickly adopted tools from the modules and that they adapted them to various degrees to the individual situation. There were indications for a shift from what a teacher does in the class to how students react to it and what that tells about learning outcomes. It became however clear that the courses were not suited as a direct way to an advanced use of the ideas with a focus on educational quality. There was a need for reflecting about the experiences in the classroom and a subsequent adaptation to improve the effect of the teaching stepwise. The QUEST-rhythm with the shift between teacher network meetings and work in the subject teacher groups in the individual school provided for both reflection and adaptation (quality circle). As a consequence of trying out ideas from QUEST, the teachers often reported a greater engagement of their students, an improved performance, and a better insight into students' thinking.

It is not surprising that the shift to reflection and student learning is slow. Teachers still work under the same conditions as before, leaving only limited space for changes. In addition, they interpret ideas that are introduced to them in their current frame of understanding, and only by

going through several cycles of trying out and reflecting about outcomes a fruitful practice can emerge. This result is an argument for longer perspectives in changing education and a close follow-up of the implementation of ideas and tools.

Some feedback from teachers hinted at working conditions hampering the trying out of activities in classrooms. They reported a lack of time to plan and discuss with colleagues. Also engaging fellow teachers who were not participating in the courses was difficult for some groups. That may indicate that getting to know new teaching approaches in an active way through a course can lower the hurdle to try it out. I also saw an example of teachers who deliberately chose to use their new knowledge to boost exam performance instead of genuine learning and understanding. This is probably an effect of the importance of exams for both students and teachers as an indicator of success.

Achieving a well-functioning subject teacher group depended mainly on two factors: enough time to meet and a sufficient backing from the school leader. Time resources are essential if a collaborative process is intended. If they are lacking, any activity will stop. The importance of support from the leadership is often stressed in school development, and the study of cases in QUEST shed light on which kind of support is effective. It is beneficial if the school leader is informed about the ongoing process, communicates the role of the activity into the school community, shows up to the subject teacher meetings (sufficient for parts of it), and helps to solve problems underway. It is not needed that the school leader leads the process and attends all meetings. Direct involvement has the function of showing acknowledgement and providing the frame for the group to work.

To set up a functioning project structure in the municipalities seemed to hinge on a municipal coordination that had good links to the science teachers, the school administration, and the school leaders. Usually, these links were related to different people making the collaboration between these people decisive. When such a leader team broke up – may it be because of one person shifted position or the collaboration did not work – the activities in the municipality were weakened. Such phases could be overcome by supplementing the leadership with the lacking part.

QUEST intended to sustain activities in the teacher networks beyond the project duration. Normally, projects show a typical development of activities. In the start, the activity level rises quickly to continue on a high level over the project period. At the end there is a more or less sharp decline in activity. QUEST aimed at implementing a working model in a first phase that should be used in the second phase in a more independent manner by the municipalities. The support from the project was supposed to diminish (faded guidance) and the responsibility of the municipalities strengthened. This should provide for the possibility to continue the activities on the same or an even higher level (third phase). Plans for spring 2016 show that all the municipalities in QUEST intend to continue the further development of science teaching in the schools that participated. This can be regarded as if QUEST succeeded in making the project sustainable. However, one has to take into account that the continuation depends on funding of the coordinators and the activities either by the municipality or the

funds available through prolonging QUEST meaning that the municipal coordinators have some money at their disposal.

QUEST will like other projects not continue for a long time as a “project”. The involved municipalities have plans for further activities in a similar arrangement like in the previous year with an opening to new schools. How long this third phase will last depends on whether the activities are supported by the responsible institutions in the municipalities. Much more important than keeping QUEST alive is actually to cling on to the ideas and the knowledge about successful collaborative change processes. Here lies the biggest challenge for using what we know collectively because it requires informing new actors about the ideas, convince them of the potential benefits, and secure that the implementation takes into account all the factors that are crucial for visible changes.

There are a few points regarding the achievements of QUEST that call for follow-up work in order to sustain and further develop the improvements. From the teacher network meetings there is some indication that teachers focus on what to do when teaching and to a lesser degree on how to teach and the outcomes of it. In a similar vein, knowledge sharing is often referred to as putting, for example, a teaching sequence in a data base thus confusing knowledge and information. This is not unexpected since we are used to look at the input side of the education system when evaluating it because this is easier. Improving student performance – the ultimate goal of QUEST – requires a critical evaluation of student reactions to the teaching and adaptations that foster better learning. This is addressed in the notion of re-design which was introduced to the QUEST teachers and also described in one of the booklets written to document central ideas from QUEST. The teachers’ capacity to critically redesign their teaching can be strengthened by sessions where they reflect on episodes from classrooms together with people from outside of the school who can point out weaknesses that may go unnoticed for the teachers. Such reflection with external resource persons requires trust and hence that the involved know each other.

A second point that needs follow-up is the range of ideas that was introduced by QUEST. Unlike SINUS where a comprehensive problem analysis of science teaching led to 11 content modules from which the schools could choose, QUEST selected topics that were thought to be highly relevant and should be introduced to all schools. When teachers have reached high levels of competence in these fields, other challenges may become visible calling for new approaches. Also here, access to resources that can inspire solving the new problems is needed. As a conclusion, it seems to be advisable to provide for evaluative activities well beyond the project duration for a project like QUEST.

What QUEST revealed about change projects

In the following, I discuss some general issues around change in education that QUEST shed some light on. The issues are cultural barriers against change, the feasibility of sustained change processes without the provision of resources, and complexity of changing education.

Cultural barriers to change

QUEST started out to enhance teacher professional development on the level of whole municipalities in Denmark by initiating collaboration between subject teachers in science and technology. This was not established before, and there were concerns that Danish teachers would not be inclined to adopt that approach because of a general Danish school culture where criticising others openly is not accepted. The project succeeded in achieving this goal despite some reservation in some teacher groups at the beginning of the project that were mentioned in the last KK-meeting on December 10th. I interpret the initial reservation as based on uncertainty typical for educational situations. The available information was not enough to give the teachers a clear picture of what they were going to meet and what was expected from them. This is not to say that information was lacking. I believe that it is not possible to give the needed information when application in practice actually is not involved. Written and oral information can only be an invitation to participate in a new practice and a promise that this will lead to substantial improvements on various levels. The teachers have to put some trust into the project because they cannot evaluate likely outcomes of new approaches without having tried them.

The concern that a certain practice developed in one cultural setting is not possible in a different culture is quite widespread, but I think not based on appropriate evidence. The experiences in QUEST add another example of that. Similar concerns were raised in Germany when the SINUS-programme started in 1998. There was no culture of sharing thoughts and experiences about teaching between teachers, and collaboration between schools concerning the teaching was lacking. This is from my point of view not a question of a national culture, but of “general” school culture. That means that not common traits and attitudes of individuals working together in a school are in the way of collaborating and improving instruction, but that the school as a social system provides a structure that suggests the staff to adopt a certain working style. The structure is built by e.g. curricula and governing laws, the number of teaching hours, the number of students in a class, available teaching resources, and parental expectations. The working style emerges from all these factors making the school functioning regarding its explicit and implicit aims. The individual teacher has only limited possibilities to deviate from the established working style which is the reason why change in schools depends on collective and collaborative approaches.

What happened to the teachers participating in QUEST was that they realised the advantages of talking to fellow colleagues about what they experienced in their teaching, what they struggled with, and how they could cope better. They experienced that the offered teaching approaches and tools were feasible by trying them out first with other teachers in the course. Later in their classrooms, they found that the theoretical ideas and tools improved their interaction with their students and that their use was actually feasible within the frame of their teaching conditions. All this made the teachers gradually accept the working mode in QUEST given the freedom to do so by being a member of the project.

Sustainability of project results

A second goal of QUEST was to make the achieved changes in how subject teacher groups worked together sustainable beyond the project period. The project was, hence, designed to

start with modules that introduced the teachers to how they should collaborate and to what they could use to improve their teaching. The participating teachers were supposed to carry their knowledge into their schools, recruit fellow teachers into the collaboration, and bring their experiences back to the teacher networks at subsequent course days. In this process of conveying and testing ideas and tools another process was embedded in order to make the project sustainable. Actions were initiated to build up structures where certain people took over some responsibility. The responsibility had to be shared between different levels – the municipal, the school, and the subject team level – in order to prepare the municipalities and schools to take over after the project had ended. In the second phase of the project, this approach was further intensified, encouraging the schools and networks to continue under their own premises. There was the idea of building a support centre that could help the groups in the building up of resources and to fade the guidance following the progress in taking over responsibility.

Forms of sustainability

Initiating and implementing innovation by projects is a common idea in many areas. Experience from education showed that the innovation is usually not sustained beyond the project duration. Despite these robust findings, there seems to be widespread belief or at least hope that the good ideas of such projects can be effective also without further resources and in competition with new projects that receive external funding. Since any change in the educational system that is supposed to benefit the students is dependent on putting in some work that can affect the intended changes, such a belief of a self-sustaining, continuous change process without further support is flawed. The example of medicine where it is hardly imaginable that a new treatment is not institutionalised by supplying the needed money and knowledge may show how innovation is handled in other sectors without claiming that changes in medical treatment are of the same difficulty as changes in education.

Sustainability of QUEST beyond the project duration can be understood in many different ways. In the application to the Lundbeck foundation, QUEST refers to the idea of sustainability by distinguishing between the implementation of a project that affects some changes and the institutionalisation where mainly schools adopt the support of the further process. Regarding support from the school, the application mentions two crucial aspects of institutionalisation: budgetary provisions and teachers' lesson plans implying that resources are needed which have to be taken from other activities. By this, QUEST moves further than the above criticised belief of self-sustaining change independent of support measures. Here, I want to introduce two notions, continuing project and institutionalisation, which describe different forms of continuation of innovation projects. One should be aware that there can be more forms that are gradually distinct from the two and that transitions between the forms are possible. The possibility of transitions does also include that an institutionalised practice can be terminated, i.e. also positive changes can be reversed.

The first notion, continuing project, means that all or most of the project activities carry on for a certain period of time. Participants can be former participants and/or new ones. Rationale for such a continuation is either to give more time to the development in order to further improve and stabilise the new practice or to expand the benefits to new schools. The

organisation of a continuing project is characterised by typical project features: separate funding over a limited amount of time, involvement of former project staff, and similar working structures and content as in the original project. Continuing projects can carry on as long as there are enough participants and the needed resources are available.

The second notion, institutionalisation, I use for the broader implementation of a general concept – in this case the concept of effective teacher professional development that improves students' performance. It is aiming at improving the current system by developing new practices in a reflective and collaborative way. It needs to be based on research knowledge, an evaluation of outcomes, and adaptations of the practice. Such change processes do not only affect the schools and the teaching there, but also other parts of the education system that are involved in delivering education. In a long-term perspective, the system is not only developing new practices, i.e. how a school administration is organising competency development of its teachers, but is also substituting established ones that are less efficient. The point of wider effects in the education system makes institutionalisation more complex than projects and more vulnerable to disturbances. Institutionalisation is dependent on the political will at all levels involved and an awareness of possibly interfering decisions from other processes. In other words, institutionalisation needs a shared goal and a strategy where actions are tailored to meet the requirements for a successful implementation.

Sustainability of different initiatives

In the following, I want to compare QUEST with the Norwegian SUN-project (Skoleutvikling i Norge) and the German SINUS-programme which inspired both the Scandinavian projects in order to illustrate the achievements regarding sustainability beyond the project period after the funding had stopped.

SINUS

The SINUS-programme was a nationwide teaching development effort with a five-year initial phase and two consecutive phases of two years each to spread the experiences to new schools. This provided for good opportunities to identify supporting and hindering factors and to adapt approaches accordingly. SINUS received wide attention in Germany because of its size and outcomes. There were, however, distinct regional differences due to the diversity in the German education system where the federal states hold the responsibility. SINUS developed a twofold network structure. First, there were the subject groups in the individual schools linked to other schools in local or regional networks within a federal state. In addition, some collaboration on school level happened across federal states. Second, there was a network of coordinators which spanned from the federal state level to the national level. Towards the end of the programme, the coordinator network asked for a continuation of activities on the national level, but because of the distributed responsibility the logistical and resource-related challenges could not be overcome.

However, many federal states continued activities for several years with funding from the respective institutions. The idea of instruction development in networks was also used in new subject areas (support of students with migration background) and for other change processes like curriculum development and development of national education standards. Providers of

teacher professional development in the federal states were involved in the SINUS-programme and often also in follow-up activities. Some ran courses for teachers that referred to SINUS for at least some years. Since there is no systematic evaluation of effects of the SINUS-model on the providers, it cannot be said whether any general change in the provision of development activities in these institutions occurred.

SUN

The SUN-project ran in Norway from 2010 to 2013 in four regions. Despite a common description of aims, problems, and approaches there were considerable differences in the regions. SUN had, from my point of view, the lowest level of coordination across the regions of the three mentioned projects. There were yearly meetings between those involved in running the project in the regions about experiences and milestones for the project. Activities in the regions differed considerably in the degree of catering for the development of new knowledge about teaching, trying out and reflecting on experiences. I know that activities ceased in one region at the end of the project due to a lack of financial resources for coordination, but there was also one region that continued to spread the project. In this region, acquiring funds was crucial. This was done in a systematic way approaching the school owners who have resources for teacher professional development at their disposal.

QUEST

In regard to the sustainability of the working structures, QUEST can also point to some achievements. The handing over of the responsibility for the second phase and the development of a municipal network of schools and teachers worked in all municipalities. There are some variations in what is done (topics) and how it is done (arrangement of meetings), but this was rather expected given local conditions and the influence of individuals and their preferences in social systems. There is also the prospect of a continuation in 2016 which is due to the will of the municipalities, the coordinators, the school leaders, and the teachers. This is facilitated by the fact that schools will still have some financial resources because the project has been prolonged. All municipalities have scheduled at least two network meetings in spring 2016 and open the follow-up to new schools. These activities can be seen as continuing projects, now in responsibility of the municipalities.

In two of the municipalities there are other initiatives under way that have a broader scope. Randers has developed a strategy for the improvement of the professional competence of teachers in the subjects Danish, mathematics and foreign languages. This should be achieved by establishing professional learning communities in these respective subjects following the approach in QUEST. Coordinators for these subjects have been hired, and they are supposed to work together with the personnel involved in QUEST and its local follow-up project in science and technology. Aarhus has started an initiative in 2014 inspired by QUEST in order to fulfil the new requirements for teaching competence (KOPRA). It includes the subjects Danish, mathematics, and science/technology. The courses for the teachers, which are run by VIA, are meant to become networks, and the participating teachers are supposed to pass on their new knowledge to fellow teachers at their school, thus, forming a subject teacher group.

The plans in the two municipalities can be regarded as a step towards institutionalisation because they are aiming at all schools and several subjects. They have a long-term perspective and include features like subject teacher groups (PLCs), teacher networks, and coordination. With the information available and given the actual state of the initiatives, it is not possible to say that they are or will be an institutionalisation of QUEST. I want to discuss one feature of both initiatives that may raise a concern whether they can function like QUEST.

In QUEST, the principal goal was to improve students' performance by means of collaboration of teacher teams regarding their instruction. The subject teacher group in the individual school had, thus, a crucial role which was explicitly described in the agreement between municipalities and the QUEST-project. The new initiatives in Randers and Aarhus, however, mention the improvement of teacher competencies as an aim, and this seems to be connected to the new formal requirements for teaching competency. Insofar as a formal qualification is connected to an individual teacher, it raises the question whether teacher networks and PLCs in the new initiatives will function in the way it was shown in QUEST.

From the available information about KOPRA it can be implied that teachers who are in need of further formal qualification (up to 30 ECTS points) are sent to courses at VIA. These courses are said to be organised similar to the QUEST-modules, but there certainly has to be a somehow different focus since teachers are supposed to take an exam at the end of the course designed to approve subject competency. These teachers are also supposed to involve their fellow teachers at the own school. Whereas this is a mandatory part of the teacher's qualification process, his or her colleagues are not included in the same process. Given the reported difficulties in some of the QUEST-schools to involve their colleagues in joint activities, this blending of a formal and an informal development process under tightened time conditions for collaboration is a threat against the functioning of the initiative. Two crucial questions concerning the success of KOPRA are whether the teachers in the schools have enough time to listen to their colleague and work together with him or her and whether the teacher groups can establish a shared interest in developing their teaching. Without a clear support from the project itself, these tasks seem too demanding for the teacher trying to improve the own qualification.

The initiatives in Randers and Aarhus give hope that a broader anchoring of experiences from QUEST in municipal structures may happen. There is, however, the threat that a teacher professional development initiative which has an informal character becomes weakened by linking it to a formal competence requirement. The allocation of resources, the different status of teachers, and a focus on formal qualifications may lead to a situation where the motivation for collaborative activities is no longer sufficient.

Complexity in educational change

The previous section showed how QUEST succeeded in sustaining project ideas. First, it secured the continuation of activities in all municipalities beyond the year 2015. Like in the other two projects in Norway and Germany, for continuation required that financial (for personnel and arrangements) and structural resources (coordination) were available and that a political will at a relevant administrative level was in place. Although differing in scale, the

activities following the three projects have again features of a project: former project staff, new funds limited in time, termination when aim is achieved, done in addition to “normal” work in the institution. Although such follow-up projects are one step forward, they are probably not enough to produce substantial changes in the education system. Here, QUEST can point to a second step: the initiatives in Randers and Aarhus implementing QUEST features in school development across the whole municipalities. It remains, however, unclear whether these initiatives will lead to institutionalisation since the national level, which has legislative influence on the Danish school system, is not involved, but seems to impact the organisation of the initiatives. The national requirement for a certain level of formal competence in the teaching subjects that is addressed in the two initiatives may compromise the functioning of the collaborative approach in QUEST.

Experiences from QUEST point once more towards the complexity of improving school. They show how many steps from the original idea to the new practice in a classroom have to be taken and the either supportive or hampering influence of institutions and individuals on almost all possible levels. In QUEST, many of the mechanisms have become visible allowing for adjusting actions and re-establishing conditions during the project. The transfer of research-based knowledge to the classroom does not only mean translating academic texts into more comprehensible forms, but also to apply the ideas in practice and reflect on experiences and further adaptations. The implementation of new practices requires contributions from all levels in a system. There has to be a top-down component communicating the direction of the innovation and the framing conditions. The actual process of implementation happens in the classroom and in teacher groups and has to be owned by the teachers. From them, information has to travel upwards to allow for securing the support and additional actions to enhance the improvement. A lack of proper communication impacted more than once on the work not only in QUEST.

At the previously mentioned status meeting at the Lundbeck foundation, Jens Dolin talked about different levels within the school system that seem to be separated to some degree, being able to make independent decisions that also influence the performance at the other levels. There seem to be no mechanisms that prevent one decision at one level from countering decisions at another level. It is, however, unclear whether a better coordination of the levels by providing communication fora is an appropriate solution. Communication is needed to coordinate, but is no guarantee for it to happen. This will only happen if the different levels are interested in the same aim and are willing to accept the systemic nature of the system.

A deeper problem seems to be the inner logic of the subsystems. I would like to explicate this by looking at political responsibility and leadership. When a system works, it is enough and probably best to do nothing. When problems become visible, immediate measures are expected which often do not meet the requirements for suitable reactions. In addition, ideology-based decisions contribute to a back and forth movement in terms of activity strategies, consume resources within the system, lead to avoiding strategies by the involved teachers, and disturb long-term processes. Since similar logics function in other subsystems of education, there is always the dilemma of conflicting interests. What is needed to improve is a

wide consensus about the long-term goals and a slow but steady reflective process. The teaching profession has to become a profession that is less steered by political agendas and more responsible for the development of quality that shows through improved learning and improved relevance of teaching seen from a student perspective.

I have not much hope that a general change of policy concerning long-term strategies is coming soon. So far, I have heard of two countries, Finland and Singapore, which developed their school systems over decades with the aim of using the human resources to the highest degree with visible success in international comparison. I wonder, however, why other funding agencies do not fill the strategy gap and try to influence policy. Instead of expecting new projects to promise the impossible, they could choose approaches that really have evidenced their potential and found a centre that has the resources to develop further, distribute, and implement those ideas in the field over a long time. QUEST, for example, has showed its potential to improve teaching and school culture, but it will take additional years of intensive work in order to show to what degree schools who adopt a collaborative approach for the development of teaching can outperform other schools regarding cognitive and affective indicators. If it were possible to continue working with some schools and document convincing effects on the classroom and student level, this would lend strong arguments to a different approach of competency development in schools than prescribing formal education requirements for teachers. It would also break with the pattern of implementing ever new projects without bringing them to a state where they really become alternatives within the current system. Such an effort needs independent funding agents which can decide free from political needs and educational fashion.