

What Does it Take to Implement Research-Based Knowledge in Schools?

A collective model for teachers' development

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Introductory background

Arnetha F. Ball & Cynthia A. Tyson declare in a text published on AERA's homepage (2011-06-29):

We have been vigilant in executing the first half of our mission: We hold each other to high standards, we review critically each other's scholarship, and we invest significant time and energy in an effort to publish only the best education research. We have been less vigilant and less effective, however, in promoting "*the use of research to improve education and serve the public good.*" (Ball & Tyson, 2012).

This observation is not typically American in any way. In many countries where educational research is conducted, similar statements are made (cf. Doyle, 1977; Edwards & Protheroe, 2004; Erbilgin & Fernandez, 2008; Valencia, Martin, Place & Grossman, 2009; Zeichner & Tabachnick, 1985; Kroksmark, 2012). The research is successful and rewarding for researchers and the scientific community, but when it comes to the results of the research changing, developing and improving the practice of local schools, the outcome might be called a failure. It seems to be the case that educational research, disciplinary theoretical research and research on education formulate internal scientific questions rather than studying problems that teachers in the practice of local schools express and encounter. For this reason teachers seldom ask for research-based knowledge, nor do they show any inclination to take an interest in science. Hence a difficult credibility gap has been established between researchers and teachers, between science and the activities of schools.

Parallel observations may be made concerning teacher education. In most countries it has for decades been difficult to establish research in teacher education, such that is done by teacher educators (Sikula, 1996; Husa & Kinos, 2005). One exception is Finland, where several studies show examples of research-based teacher education – which is also very successful from the point of view of quality in the individual school as regards teachers' competence and pupils' knowledge performance (Kansanen, 2011). Otherwise it is more common for research concerning teacher education and teachers' competence to be located at departments and faculties that only have an indirect influence on the education. For this reason teacher educators do not have the connection to research and science that is normal in other academically based vocational educations.

Since teacher educators do research themselves to a lesser degree, this results in research and science not being present in the teacher education in the same frequent way as in other university educations that are comparable in length and extent. The consequence is that the student teachers do not assimilate a scientific and exploratory competence that is integrated into the professional competence, as a result of which they develop neither scientific curiosity nor an exploratory approach. If the teacher education does not develop these competences in the students, the consequence is that they do not meet any teachers doing research either when they get their first posts and that they will never do research themselves in their own educational practice. These conditions taken together may explain Ball & Tyson's crass observations: "We have been less vigilant and less effective, however, in promoting *"the use of research to improve education and serve the public good."*" (Ball & Tyson, 2012).

A possible way to go

In a small town in Sweden there is a preschool and a primary and lower secondary school with about 600 pupils and about 96 employees (teachers, headmasters, school psychologist, caretaker and administrative staff). The children are between 1 and 16 years of age and in the school year 2009-2010 they achieved very weak results. The school is in area that is culturally homogeneous, but the educational level of the inhabitants of the town is relatively low. Most of them are self-employed small business owners and farmers. Hardly any criminality has been reported. The weak performance is therefore surprising.

At the end of 2009 the municipality's politicians asked the local university to try to improve the pupils' study results and at the same time conduct research on the causes of the weak results. In talks with the municipality, the school's headmaster and its teachers, it was decided that extensive competence development of the teachers should be implemented, at university level with academic credit courses. The effort to develop precisely the teachers' competence was an effect of the insight that the school cannot change the pupils' socioeconomic preconditions. It is equally impossible in the short term to change national laws, statutes, curricula or syllabus goals that are centrally established.

The only remaining solution is to develop new teacher competence that is able in a better way to interpret and put into practice the public governance at the local level in an extremely important combination in order to improve the teachers' teaching skills, so that in a more advanced way they can handle all conceivable differences among the pupils. The objective was to develop such teacher competence that it would not matter what socioeconomic or other background the pupils bring to school. It is pedagogy aimed at reaching beyond structurally given prerequisites, pedagogy focusing entirely on learning: *the pedagogy of learning*.

On July 1 2010 the project started. All the teachers (96) in the local taught full-time and studied half-time at university level within the framework of full-time employment. This was possible through the studies/research being integrated into the teaching time in combination with some periods being specifically reserved for the studies. After one year the teachers have completed their courses (30 credits) and they have

also implemented a scientifically based way of understanding and conducting research.

The effort to develop all teachers' competence so that by the side of their teaching skills they could also assimilate research competence resulted in a study being implemented with the following goal and aim.

The aim of the study

- How can research in the local school be established and become a part of teachers' work in a local educational practice?
- What is required from the school's organisation to enable research to become a part of teachers' work in a local educational practice?

The project's parts and organisation

96 employees took part in the study at a school with pupils aged 1-16 years. Of the 96 persons three were school heads, one was a school nurse, one a school welfare officer and 91 were teachers. All the teachers have gone through teacher education and are qualified. The school is a provincial school located in a small town in Southern Sweden. The educational level of the parents is low, they are ethnically homogeneous and their interest in studies is not particularly extensive. The school's results measured in pupils' performance are the weakest in the municipality and among the weaker in the country of Sweden.

The project includes two distinct activities and the school is therefore organised in two different ways. The first is called *development organisation* and comprises competence development of all employees through university courses. This activity will continue for five years, and the goal is that everybody will have been examined at Master's level in education with clear demands that they all must develop research competence specially developed for teaching research. The other is called *activity organisation* and consists of the school's basic activities, namely the ordinary schoolwork. It is important that a school, that is to develop collectively, thinks and plans as if it were two organisations, where the competence development part is one thing that follows certain national laws, rules, periods and possibilities compared to the activity part, which is subject to other demands and possibilities.

The competence development part is constituted on the basis of what we call *The 3O model* (Aaberg & Kroksmark, 2011). It contains four parts: *inspiration*, which may be lectures, study visits, film/theatre or something that will inspire the participants to work with local research. The inspiration is always linked to texts or pictures to be studied. The inspirations take place during a whole day every three weeks in working hours. *Group seminars* are the second part, where the teachers are divided into groups of at most seven persons in each. The seminars are supposed to deepen the knowledge of the things that have been presented in the inspirations. The seminars take place during three hours every three weeks in working hours and are led by a colleague at the school. The third part is called *group supervision* (Aaberg, 2009). The same groups are involved as in the seminars with the difference that there is a supervisor with an academic degree who is employed as a teacher at another school in the municipal-

ity. In the group supervision no question must be brought up that have to do with the inspirations or seminars. Nor is the required reading allowed to be discussed. The group supervision must only deal with questions that the participants come across or experience in the school's teaching practice. The questions must be formulated in advance and presented in the group. After voting the group then chooses the question to be dealt with. The chief aim the group supervision is to formulate the question – not to try to solve it. Group supervision takes place every three/four weeks and comprises about two hours.

The fourth component of the competence development takes place directly within the framework of the activity organisation. It is the research that the teachers learn within the framework of the competence development part but is implemented in the activity part. All the teachers learn one and the same theory formation and methodological approaches – *phenomenography* (Marton, 1981). The reason is that diversified theories and methods lead to discussions about teaching research that make the research lose its focus on the content. Furthermore, the advantage of everybody having the same scientific basis is that it encourages cooperation, involves discussions among the teachers that have one scientific focus, and gives the school a homogeneous scientific basis. If the teachers want to proceed later on with their competence development as researchers, they can then deepen and broaden and diversify their scientific repertoire.

Phenomenography was chosen because it was developed to study how pupils experience and understand the learning content of schooling in qualitatively different ways, where the descriptive level is content variation. The research object is thus the variation in the contents of the descriptions – i.e. the different ways in which the pupils experience and understand the knowledge content they are expected to learn at school. This implies that the research studies the pupils' learning object, that which they experience when they are supposed to learn something (at school). Marton notes: "What does it mean, that some people are better at learning than others? which in its turn led to the second question: Why are some people better at learning than others?" (Marton, 1994 pp. 4424 – 4429).

The basic assumption is that if the pupils experience and understand the learning object with content variation, they also learn with different qualities, which in turn implies that they both learn different things and do not learn them equally well. Since the pupils unconsciously possess different qualities in their understanding of what they are supposed to learn even before starting their learning, they will also learn different things as a consequence of this. That is the very basic explanation of why we all learn more or less quantitatively and with different qualities. The teachers in the project described here will learn to study content variation in the pupils in a systematic way. They will implement research of their own and analyse and describe qualitative variation of contents. When they have done that, they will plan their teaching against the background of the results and at the same time reflect on their own conception or understanding of the content and on how the content quality is described in the syllabus or curriculum. The teacher's and the syllabus constructor's conceptions and understanding of the content are equally

often unconscious and taken for granted as among the pupils. Then the teachers will use the combined knowledge of the variation so that they can meet the complexity that exists in a classroom with between 25 and 30 pupils in an ordinary school. The level of the teaching must be docked to the level that the pupils had initially and the planning must be done so that the pupils will be able to move from their own starting-point to the goals established in syllabuses and curricula. The second part of the teachers' research takes place when all the analyses of variations are made concrete in lesson planning and the implementation of the lesson (or the series of lessons). The lesson will be documented via film or sound recording. Data from the lesson is analysed in combination with the qualities of the pupils' learning being established. If the pupils have learned what they are supposed to, the process is described in such a way that it can be spread to other teachers. If the pupils have not learned what the lesson was planned for, analyses are made of the different steps in order to find out the source of the error. In principle the process looks like in the description below. In Sweden the process is called *learning studies* (Marton, Runesson & Tsui, (2004).

1	Studies, analyses and descriptions of the pupils' conceptions and understanding of the content of school knowledge (variation)
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2	Analyses and descriptions of the syllabus constructor's conceptions and understanding of the content of school knowledge (variation)
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3	The teacher's self-reflections on her/his own conceptions and understanding of the content of school knowledge (variation)
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4	Lesson planning for the pupils' learning based on the total variation
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5	Implementation of the lesson which is documented
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6	Evaluation of the results
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7	Follow-up, dissemination (writing a report)
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Data collection

During the first year (out of five) data was continuously collected via check-ups of the teachers' degree of activity for the purpose of answering the question of whether it is possible to integrate research into teachers' work in terms of both time and content. Data was also collected regarding the teachers' study performance with focus on whether they had managed the course requirements and whether they had handed in written reports in time and on the quality of these. In addition a total of eight focus talks were conducted on two occasions (January 2011 and June 2011) with teachers and headmasters about how they themselves conceive of the combination of the teaching profession's demands and their own research and to what degree research competence had influenced the teachers' ways of thinking and acting in the local school practice. Statistics of the pupils' (the 9th form) marks were compared with statistics of marks from the previous end of the school year.

Results

The results are preliminary in view of the fact that the project has so far only comprised one out of five years. We only claim to show development tendencies here.

There seems to be no doubt that it is possible to combine full-time teaching with half-time research, provided that the research is an integral part of the teaching itself. One of the teachers declare in an national broad cast program:

Yes, that's two parts to this. First, it is very hard work, it takes a lot of time because I ... I do two things at the same time. But, on the other hand, it is extremely instructive and stimulated. To get insights into the pedagogy of learning that I do now, I not think I had been able to do this by myself. What we do research about is a choice that I made myself. I am doing a study and learning where I have come to realize the very essence of teaching and learning ... I think ... something I have been searching for the last 30 years. So it has meant a lot to me.

The combination must be based on the teachers doing research on what they themselves do in their professional practice, on their seeing the usefulness of the research in terms of their understanding better the mystery of learning based on variations, and on their recognising that they can adapt the content to the levels of abstraction that the pupils possess initially, and on their being able to observe that the learning increases on the part of the pupils. What strengthens these conclusions is that an absolute majority (94%) of the teachers implement their course assignments in an adequate way and account for them on time.

The results also indicate that the teaching profession can be based on the teachers' own research. It is possible to integrate teaching and research, and the pupils' knowledge results clearly show that the quality increases when the teachers increase their knowledge of the prerequisites of learning. This makes it possible to draw the preliminary conclusion that schools must be understood as something that organises broad range of knowledge. They handle, store, and develop knowledge, administrate knowledge and communicate and distribute knowledge. All knowledge organisations must be provided with new knowledge if they are to grow and survive. Otherwise they will die. The project shows that the best way of providing the profession and the schools with new knowledge is that the teachers do research themselves and in that way develop *relevant knowledge that schools want and need*. Thereby the first important steps are taken towards solving the problem that Arnetha F. Ball & Cynthia A. Tyson point to: *"the use of research to improve education and serve the public good."* (Ball & Tyson, 2012).

In knowledge organisations governed by objectives the goal fulfilment is of primary importance. For this reason the pupils' results are an important indication of whether the development organisation functions within the activity organisation. The results measured in terms of the pupils' performance show that there is a marked knowledge increase (Table 1). At the end of the spring semester in 2010, 82% of the pupils were sufficiently qualified for admission to upper secondary education (Table 1) 73% of them had pass marks in all subjects (--- in Table 1). At the corresponding time in 2011 88% were qualified for upper secondary

education and 94% had at least a pass in all subjects. The change is remarkably good. The change is very important and interesting, but it should be handled with great care. The number of pupils that are compared is 123 in 2010 and 119 in 2011, which is a very small population. Looking at what the development has been like in the last four years (Table 2), it may be observed that *the trend*, concerning the variable of pass marks in all subjects (– in Table 2) is steeply rising during the first year of the project. The increase regarding the proportion of pupils with marks in all subjects (--- in Table 2) is somewhat less drastic. Two factors should however be noted in this context. Firstly, it is more difficult to raise pupils' performance in the uppermost quartile and secondly, the database actually consists of all the pupils who get their final marks in precisely the school that is the empirical example here. In other contexts this is called "reality".

One prerequisite for successful development projects is that the model itself works, both as an integrating part of the activity organisation and as a clear driving force for developing new qualities in the teaching profession. The four legs that the 3O model rests on seem to be the prerequisite that has to be systematically established in order to correspond to the demands that competence development in education must make. The results also show that the collective approach to the competence development – where everybody must participate – is a very important and decisive condition for success. The group supervision is the individual component in the 3O model that yields the best result as regards new insights into the profession that lead to concrete consequences. The reason is stated to be that group supervision is based entirely on the most concrete problems and questions of the professional practice. It is thus close to professional life and lived, familiar, possible to identify for everybody and hence extremely important. An element of the collective ambition is that everybody does the same thing, learns and develops at roughly the same pace (similar to the pupils everyday school situation), but that this change is broken down into small groups. An important consequence of the collective approach is also that the content of the discussions in the staff room is centred on teacher research to a high degree. The parent-teacher talks now contain references to the teacher's own and others' research. There is also a point in the coordination of the scientific theory and the method. Everybody can relate to the content of the collectively captured competence development.

In the research done by the teachers it is obvious that they formulate other questions than the academic research. Teachers are considerably more concrete and they are above all *focused on results* in combination with a clear utilitarian aspect of the research question. This distinguishes practitioners' way of doing research from that of university researchers.

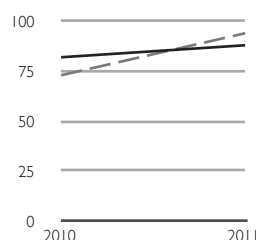


Table 1

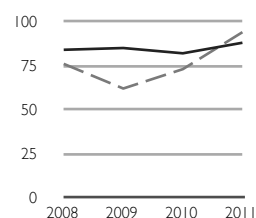


Table 2

Key results of the study are that the teachers state that they have completely changed their attitude to the profession. A spirit of community has developed among the teachers and they have been able to establish a joint professional object, something that unites all groups of teachers in terms of knowledge, and that is the knowledge of the mystery of learning. This was pointed out before by Martin Heidegger in *Being and Time* (1927):

Teaching is even more difficult than learning. We know that but we rarely think about it [...]. Teaching is more difficult than learning because what teaching calls for is this: to let learn. The real teacher, in fact, lets nothing else be learned than – learning. The teacher is ahead of his apprentices in this alone, that he has still far more to learn than they – he has to learn to let them learn. The teacher must be capable of being more teachable than the apprentices. (Heidegger, 1972, p. 356).

The very fact that a professional object has been established during the project period may be decisive for the success. It implies that the conflict between educational competence and subject knowledge has been disarmed. It has become more evident that teaching competence may be describe by the maxim: *Non Satis Scire: To know is not enough.*

Conclusions

Research competence as a clear part of teachers' educational competence seems to be the combination that teachers must now develop and capture. This is the crucial issue of the teaching profession. If the research that is done in education and the disciplinary departments of universities does not reach the practice of local schools, the active teachers, or does not contribute to improving the quality of the pupils' learning, the prerequisites must be changed. The results indicate that education has become too much of an internal theoretical science. Established researchers study with great enthusiasm issues at a level that school teachers never get into contact with. Disciplinary theoretical research has corresponding problems as regards the possibility of influencing the practice of schools. This explains the credibility gap between research and teachers' professional practice and understanding. The project shows that an explorative attitude in teachers can be established in a short time and that it is of decisive importance for the quality development of the profession and of pupils' learning.

The teaching profession is basically collective – although it is often pointed out that the teaching profession is very lonely. In this study it is clear that an important, maybe decisive, component, is that everybody participates. The collective effort is superior to individual “pilots” that are supposed to have priority over the collective. Teachers do not have the maturity in the profession that allows a colleague to teach other colleagues in the same school. For this reason collective development projects are preferable.

One problem that has been constantly attending the project may be described *in terms of the academization of the practice of schools*. Is there a “practical science”, a science that is unique in its theoretical and methodological assumptions as a consequence of existing in a concrete practice? Ar-

istotle talks about “practical wisdom” as the most excellent kind of knowledge. Can this be the knowledge foundation that the scientificity of the teaching profession should be based on? What this project has done so far is to transfer established theories, methods and models for research that are academic. They have been created in universities. They have failed in their ambition to change and develop schools. If the project academizes the scientific basis of schools and the scientific competence of teachers doing research, the project will have contributed to laying the basis of a new failure of the attempts to develop schools.

By tradition teachers seldom seem to talk about their profession in a systematic way during working hours. Group supervision is something that ought to be introduced in all schools that work with some form of competence development. Group supervision – as it has been implemented in this project and as it is described by Aaberg (2009) – possesses the potential that can enable a professional discussion comprising the decisive exchange of experience of the innermost core of the profession, of that which is about the mystery of learning. Teachers must reach the questions that make the profession unique and exclusive in relation to other professions, which implies understanding the profession on a scientific basis and acting in a concrete and local professional practice as a consequence of their own research.

A thrilling note as we did in the project is about the academisation of the school's practice, or the imp-lication of research in schools, conducted by teachers. What happens when the university's old traditions, when it comes to the conception of science, is confined in a genuine educational experience in an local school? Does the school become a poor copy of university research or will group supervision become the guarantee that practice always corrects for weak academic theories?

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