

Teacher generations in an era of reform

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Abstract: Danish upper-secondary school is currently undergoing remarkable changes. Comprehensive reforms and restructuring have transformed teacher roles and school organization. However, not all upper-secondary teachers welcome reform: on the one hand, they have to adopt norms, standards and values determined by colleagues, if they want to “fit in”; on the other hand, they are confronted by governmental and educational claims, but also their own interest in doing things differently. This paper analyzes generational differences and similarities in the post-reform school in regard to learning values and the competence discourse, which are an important part of the reform discourse. In addition, it explores the dilemmas which arise for young teachers their understanding of practical and theoretical teacher training. This paper combines theoretical approaches with data analysis being both quantitative and qualitative. Finally, this paper discusses team work as an important means to make dialogue between teacher generations possible and to enhance reflection on the relationship between practice and theory.

Key words: educational reforms; teacher training; teacher generations; teacher roles; learning issues

1. Introduction

In the debate about schools and teachers—not least in informal discussions among teachers and researchers—the issue which regards “reform resistant” teachers over and against “progressive” teachers is sometimes understood as a question of “old” versus the “young”. In this article, we will discuss generational differences in teacher approaches to reform. When doing this, we take up the following questions:

(1) How do young teachers and their older colleagues respond to the intersection between reform and school culture?

(2) Where do the coming teachers find inspiration as teachers and how do they relate to teacher co-operation in teams?

In order to answer the first research question, we will use data from a 4-year project about changes in the role of the teacher in an era of reform. Most of the data stems from a survey from 2007 (Zeuner, et al., 2008). The research team received answers from 3027 teachers, which is a response rate of approximately 55 percent. The questionnaire presented a range of statements concerning teacher perceptions about learning methods and the quality of teaching and learning after the 2005 reform. The 2007 survey was a repetition of a survey from 2005, which included 1725 teachers answering the same questions. In the two surveys, participating teachers could respond to a four point Likert scale, ranking from a high degree of agreement to a low degree of agreement

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(Zeuner, et al., 2008). In this paper, we will primarily use data from the 2007 survey to analyze generational patterns in teacher attitudes towards learning two years after the first implementation. Firstly, we look at data concerning teacher values towards learning goals: How do they relate to reproductive and productive learning? Secondly, we analyze attitudes towards individual and social learning. Thirdly, we analyze the teacher evaluations of the outcome of the student learning two years after the reform. This final point regards especially in relation to themes such as student understanding of theories, application, in depth work and co-operation. The aim of the analysis is to answer the question whether the young teacher are being trained for the reformed upper-secondary school, i.e. as agents of change, or if they are being socialized to think and act as the older teachers, i.e. as new members of the existing teacher culture. The 2005 data will also be used in a more extensive way in order to see if there is a generational change from 2005 to 2007. Are the generations converting or diverting in the reform process?

Answering the second research question, qualitative data will be used with the coming upper-secondary school teachers in teacher training. 9 interviews made in 2008 are employed to this end. They were based on an interview guide, such that respondents were asked to talk about where they find inspiration to teach, their teaching and learning values, the ideal teacher role and their experience of the teacher culture in their own school in relation to pedagogical matters. The interviewed teachers were selected according to faculty. We have interviewed three people teaching subjects within the social sciences, three within the natural sciences and three within the humanities.

By combining quantitative and qualitative data, we aim to analyze the generational patterns to teaching and learning and to find some explanations for positions among young teachers. Method triangulation makes it possible both to make generalizations and to understand young teachers' life world under conditions of better validity and reliability of results. Indeed, by taking up this approach the article seeks to overcome the inherent biases that occur when taking up any of the methodologies in isolation.

When it comes to triangulation, one reservation must be made. In our quantitative study, young teachers are persons with 0-10 years of teacher experience. The reason why we pay interest to this group is that the new teacher training programs stressing reform-topics such as teamwork, competences and cross-curricular teaching was introduced in the last years of the 1990s. Therefore, we expect teachers with experiences between 0 and 10 years to be a special "group" being educated and socialized in different ways than the other generation groups. In the qualitative part, we interview teachers with 0-2 year of experience. The reason is that we wanted to hear about experiences from teacher actually being in teacher training. So, the qualitative data only covers a part of the respondent group of the quantitative data. However, we assume that the candidates in teacher training belong to the same "historical generation" as teachers with 2-10 years of teacher experience.

2. Situating the study

In contemporary knowledge society, there is a belief within business and government that better and competence-based learning will make it possible to deal with the accelerating rate of technological change, fluctuating world policies and the expansion of the global economy.

Around the globe, as well as in Denmark, there has therefore been an increasing focus upon academic teaching and learning environments. Western societies and welfare systems, as well as their competitiveness, depend on human resources, lifelong learning and development of competencies, creativity and flexibility.

However, it has not yet become entirely clear how this situation should be handled. Testing and competition between schools is one solution. From this perspective, goals and means must be clarified and competition between schools must be reinforced in order to create more committed teachers. The American program NCLB (No Child Left Behind), for instance, is based on this strategy and has had great influence on European educational debates. It suggests four principles, namely, accountability for results; more choices for parents; greater local control and flexibility and development of teaching programs based on research (U.S. Department of Education). One may call this approach as the Anglo-Saxon reform path.

Another solution is to combine competition with an increased focus on student learning strategies, emphasizing cross-curricular learning and meta-cognition, as well as social and democratic relations and values. Here, focus is upon lifelong learning, “bildung”, critical, creative and innovative competencies. One can, in turn, call this the Danish reform path, because they seem to divert radically from the direction taken in other countries. The Danish reform path is the context for this paper.

In 2003, a reform of the upper-secondary school was passed by the Danish Parliament, the implementation of which began in August, 2005. Upper-secondary school teachers were to develop several new competencies in order to teach in new ways. The reform introduced cross-curricular activities such as General Study Preparation, where subjects from different faculties must be used in interdisciplinary projects. Also, teachers were required to work in teams and carry out complex pedagogical reflections, come up with and develop appropriate teaching and learning strategies, be aware of the student diversity and examine their own teaching from a critical perspective.

Many teachers find the reform rather radical, because it challenges “freedom of method” for the individual teacher, the tradition of teaching single subjects and demands cross-curricular subjects (Beck & Frederiksen, 2007). From the beginning, teachers have expressed concern for increased levels of stress. According to some teachers the reform can be seen as nothing less than a threat to the academic principles of the upper-secondary school.

From a critical point of view, didactical worries are not the sole motivation for teacher resistance. There is also a nostalgic longing for “the good old days” which are recalled as being more harmonious than they ever actually were (Goodson, et al., 2006). Arguments supporting “freedom of method” can be seen as an effort to divert attention from a lack of interest in pedagogies and didactics and a simplistic defence of retaining routines and habits. In this respect, the criticism of reform is a discourse devised to protect teachers from democratic control and from the demand for adapting teaching goals and means in a changing society.

In the current situation with radical changes and new teacher roles, we find it important to understand what actually happens to teachers who have been employed within the last 10 years—the period within which reform thinking has been the dominant political discourse. Do the changes in structures and policies stimulate new values and practices among young teachers? Alternatively, are the conservative mechanisms of the teacher culture too strong and thus prevent changes in teaching and learning in upper-secondary schools?

To understand possible changes in the generational pattern, we must take another fact into consideration: The age structure among teachers in the Danish upper-secondary school is currently changing rapidly. Many of the teachers who were appointed in the 1970s are being pensioned these years, which makes room for many new young teachers. These enter schools in “groups”, which is a quite new situation in many places. Are such changes important to the implementation of the 2005-reform? Do they support changes in teacher values, because the values among newcomers means more now than 10-20 years ago? Or, is this irrelevant since teacher values change much slower than what can be seen within one or two decades?

3. Generations and values in a quantitative perspective

In this first section, we will analyze quantitative data from the teacher role project, and discuss similarities and differences between teacher generations in the current upper-secondary school. In addition, we will compare the 2005 and 2007 surveys in a more extensive way in order to present changes within the different generations of teachers towards learning.

3.1 Theory

Our first hypothesis is that existing organizational culture has great influence on young teacher values regarding teaching and learning. The American organization theorist E. Schein defines organization culture as:

...a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems (Schein, 1994, p. 20).

According to this point of view, organizational socialization is created when new members learn to think and feel like the members already as a part of the organizational culture. The longer you have been a member of the organization, the more you will have created cultural routines, habits and interpretation patterns. Socialization—as newcomer assimilation of existing values—makes it difficult to change the stipulations guiding your basic underlying assumptions. Hypothesis 1 is the hypothesis of a generational monoculture stipulating that the young generations and the older generations are alike.

The theory regarding the construction of teacher identity mainly points out conservative mechanisms related to teacher professionalism, but how does the teacher role change if this is so? It is claimed that changing norms and standards in society have some impact on the role of teachers. This kind of evolutionary change is not based on teacher knowledge of theories and research about best practice, but on slow changes in mentality. Another variant is that teachers in an era of reform are forced to change values and practice in order to adjust to new structures. Young teachers who are socialized into an organizational culture with changed structures are possibly more sympathetic to “the new” than older colleagues. In addition, teacher training among the new generation is influenced by reform thinking, which could support the theory of young teachers as a “reform avant-garde”. We will call this hypothesis 2, which regards a generational poly-culture stipulating that the two groups are different.

Reform means “change”. The political system calls for changes in the educational system. The question is to what extent structural change, which is the main result of reforms, also creates cultural change? Do new political goals cause new teacher values? How is this to be understood in generational terms? This is a very important issue, as the reaction of teachers just after a reform is important to the success or failure of reform intentions. Our thesis is that young teachers at the beginning of a reform implementation are more positive toward changes than older teachers. The reason is, that older teachers need to change routines, habits and beliefs that have been internalized over years, while newcomers are less set in their ways.

What happens when the first waves of reform reach the schools and new routines have been created? After a period of turbulence and polarization among teachers, the educational system may tend to restructure its basic values; if this is true, the teacher generations approach each other. This constitutes hypothesis 3: the hypothesis of convergence. The opposite hypothesis is that the gap between generations enlarges and the teacher culture becomes more polarized. Hypothesis 4 is the hypothesis of divergence.

In the following, we will discuss three aspects in light of these four hypotheses, namely the teachers’ approaches to reproductive and productive learning, to individual and social learning and to the quality of the

students' learning since 2005.

3.2 Reproductive and productive learning

It is obvious that the 2005-reform focused on the importance of cross-curricular teaching, meta-cognition and methods where students are asked to handle knowledge. In more operational terms, they have to promote productive learning and to reduce the use of reproductive learning. This is not a coincidental development, but may be given a theoretical basis.

The difference between reproductive and productive learning or between reception and creation has a long tradition within theories of knowledge and learning. Inspired by Gregory Bateson (1956), the Danish pedagogical thinker Lars Qvortrup (2001) suggests different levels of knowledge and learning. The first level, which Qvortrup calls first order knowledge and learning, focuses on the "object" of knowledge. He defines this kind of knowledge as qualifications. Reproductive qualifications have their centre here. Closer to the school context, Qvortrup points out that first order learning primarily exists in situations where the teacher stimulates the students by control and elaboration made possible in the classroom.

In modern society, however, this level of learning must be combined with other levels, securing a more independent and active kinds of learning. The student must develop competencies and meta-competencies in order to be able to use knowledge. Qvortrup defines such second order knowledge as competencies. Qvortrup differentiates competencies into: (1) reflective competence (what are my resources and weaknesses); (2) relation competence (how can I use the knowledge of others and communicate with others to develop my own knowledge); and (3) meaning competence (how do I create meaning out of this?). According to Qvortrup, students can strengthen their competencies when they learn how to develop projects initiated by them. The third level of knowledge and learning is creativity. At this learning level, students create new qualifications, for instance by combining existing knowledge in new ways.

What are the teacher values towards reproductive or qualitative learning and productive learning or learning based on competences and creativity?

The following two figures show how the different generations of teachers in the 2007-survey answered questions about reproductive and productive learning; in the following figures, we present teacher opinions in categories of high, medium and low support (see enclosure for the data construction).

In this and the following figures we use PDI-scores. PDI (Percent Difference Index) comes out by subtracting "low support" from "high support". For example: the PDI-score is 44 percent for all teachers when it comes to reproductive learning. This number is a result of the pct. for teachers being sympathetic towards reproductive learning (49 percent) minus the pct. for teachers being negative (5 percent). $49-5=+44$. If more teachers had been negative, the PDI score would be negative (-). If it were a poll for parliament, the PDI-score means that the positive "side" won with 44 percentage points.

Chi2-test for reproductive learning over years within the single groups is not significant considering 0-10 years ($p=0.087$), 10-20 years ($p=0.725$), 20-30 years ($p=0.738$) and more than 30 years ($p=0.444$). When it comes to productive learning the Chi2-test is not significant considering 0-10 years ($p=0.690$), 20-30 years ($p=0.745$) and more than 30 years ($p=0.678$). The result is significant when it comes to 10-20 years (0.037). The PDI-score is calculated as in Figure 1.

Teacher generations in an era of reform

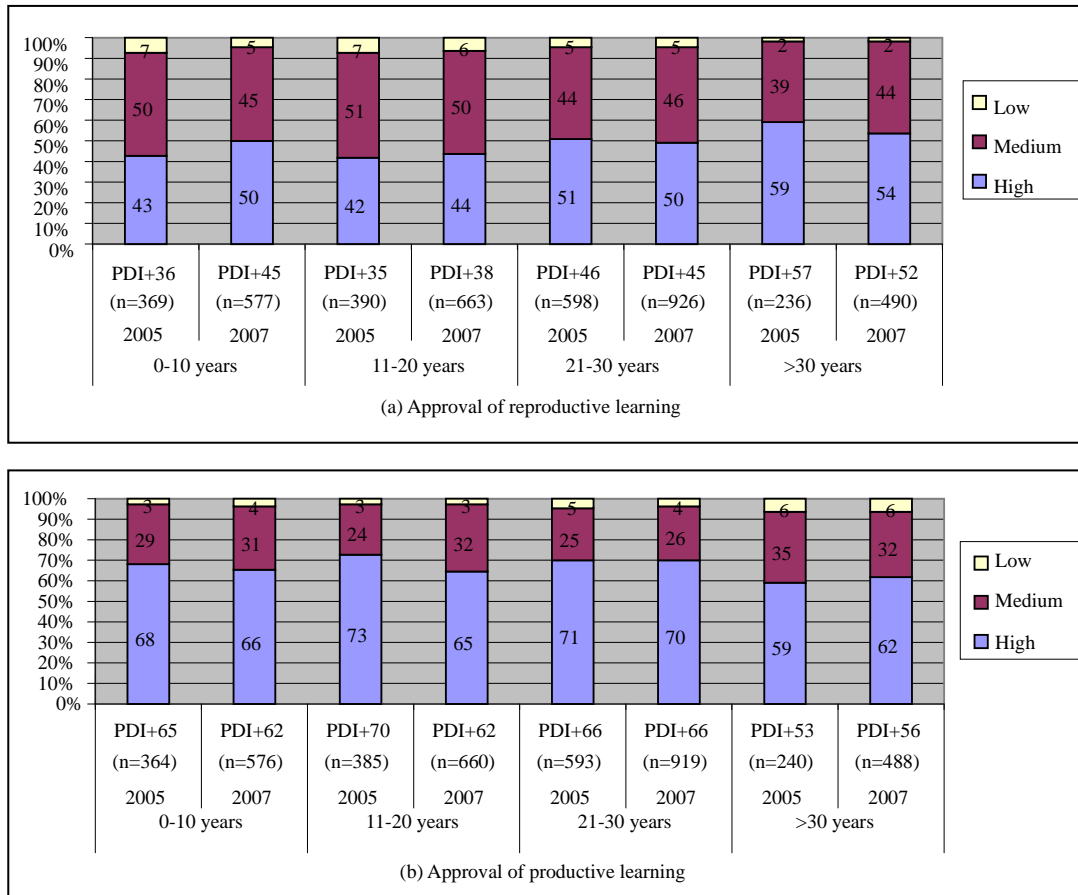


Figure 1 Generational attitudes among teachers in regard to reproductive and productive learning in 2007 (pct.)

The overall result is that 49 percent of the teachers are sympathetic towards reproductive learning, while 5 percent are negative. When it comes to productive learning, 67 percent are sympathetic, while 4 percent are negative: As a group, the teachers clearly have a more positive attitude towards productive learning than towards reproductive learning. However, this does not mean that the teachers do not appreciate reproductive learning. Very few teachers are “extreme”. Our general conclusion is that Danish teachers in upper-secondary school want to combine different “orders” of learning.

The most interesting, when it comes to a comparison between generations, is that the two tables show almost no difference in relation to reproductive and productive learning. The only small difference is that the most experienced teachers (over 30 years of seniority) are the most positive towards reproductive learning and the least positive towards productive learning.

A comparison between the 2007-survey and the 2005-survey shows that the differences between generations where it is bigger in 2005 than in 2007. The young teachers with 1-10 years of teacher experience were more sympathetic towards productive learning but during the first two years of implementation, a homogenisation has occurred where the two sides have come closer to each other, mostly because the young teachers have a slightly weakened sympathy for productive learning.

When it comes to teacher values about learning goals, hypothesis 1 about a generational monoculture without generational gaps is confirmed. Between 2005 and 2007, the young teachers have moved closer to the older teachers. This clearly supports the convergence hypothesis (hypothesis 3), when it comes to values about learning

goals.

3.3 Individual and social learning

The idea that learning is foremost individual exists within many theories of learning. The behaviorist B. F. Skinner understands learning as an individual phenomenon where the subject, through stimulus-response-processes, changes his behavior by seeking recognition. This does not mean that individual learning, for instance programmed training or individual examinations cannot take place in the classroom with many students. The point is that individual learning is not being realized through dialogue or co-operation.

The critique of individual learning has been widespread within modern theories of learning. Here social learning is the basic form of learning. Since the 1970s, the Russian psychologist Lev Vygotsky (1978) has had a great impact on the idea of learning as a social and interactive phenomenon, where the idea of individual learning is criticized. According to Vygotsky, the cultural historical school knowledge is the product of an internalization, which makes more advanced thought possible; in this perspective, learning in the “social” dialogical forum becomes central. Inspired by Vygotsky and others, Lave and Wenger have developed a learning theory, which stresses the community of practice as the central place of learning. Here, learning takes place in groups where learners learn from each other.

How are the generational attitudes towards individual and social learning?

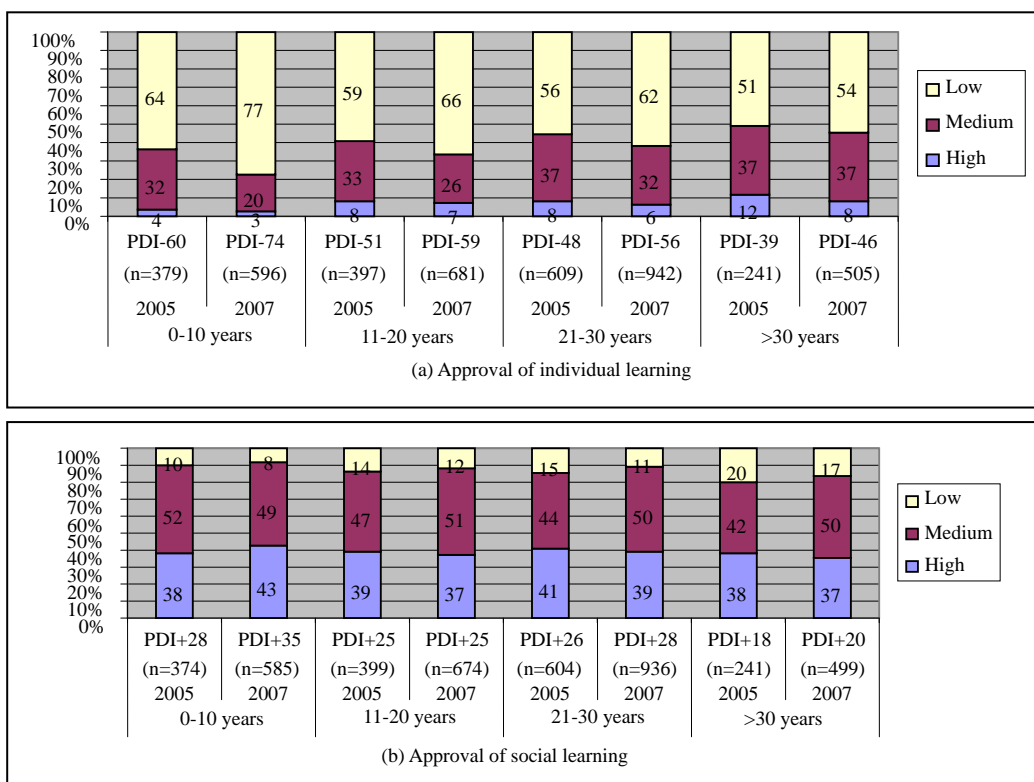


Figure 2 Teacher generations and attitudes towards individual and social learning in 2007 (pct.)

The PDI-score is created in the same way as in Figure 2. Significance has been tested for changes over years within each group. The Chi2-test shows no significant changes within the following groups: 0-10 years group ($p=0.000$), 11-20 years ($p=0.038$) and 21-30 years ($p=0.028$). There are no significant change when it comes to the group over 30 years ($p=0.198$). When it comes to social learning the, Chi2-test shows significant changes when it

comes to the group 21-30 years ($p=0.030$). There are no significant change when it comes to the group 0-10 years ($p=0.246$), 10-20 years ($p=0.397$) and over 30 years ($p=0.062$).

The general picture is that Danish upper-secondary school teachers are clearly more positive towards social learning than towards individual learning. 6 percent of the teachers are sympathetic towards individual learning and 62 percent are antipathetic. When it comes to social learning, 39 percent are very sympathetic while 11 percent are antipathetic. The result indicates that most of the teachers in Danish upper-secondary schools are sympathetic towards dialogic classroom teaching and group work.

There are significant differences between generations when it comes to values about how to learn. The young teachers with 0-10 years of seniority are the most negative towards individual learning and the most positive towards social learning. The PDI-score for young teachers is -74 percent towards individual learning, with a distance of between 15 and 28 percent points to the older groups of teachers. The difference between generations is smaller when it comes to social learning, but still the pattern is the same: The young generation of teachers is most sympathetic towards social learning with a PDI-difference between 7 and 11 percent points to the other groups. The result indicates that young teachers have integrated ideas of social learning to a larger extent than their more experienced colleagues have.

When we look at the changes between 2005 and 2007, an interesting picture appears: young teachers are even more sympathetic towards social learning than they were in 2005 (the change is 6 percentage points). The older teachers are also more sympathetic towards social learning than they were in 2005, but they do not change their position as quickly as the young teachers. This result is interesting, because an important intention of the 2005-reform was to “institutionalize” social forms of learning, for instance project work.

Another result from the survey indicates that teachers actually evaluate this part of the reform positively (see Figure 3).

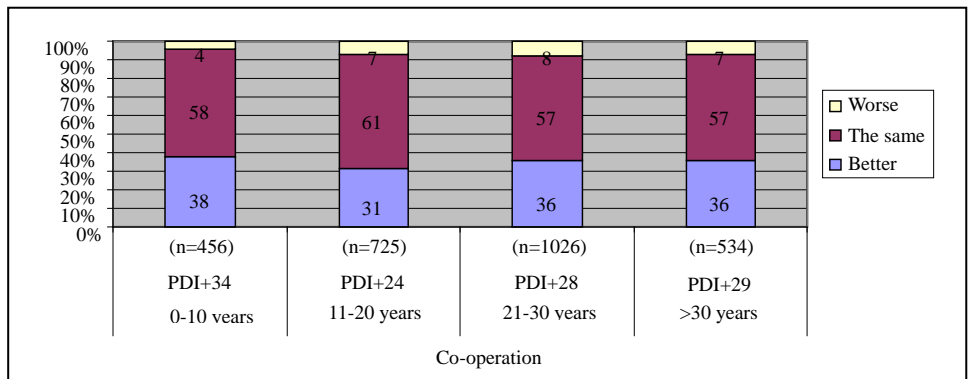


Figure 3 Teacher evaluation on the students’ ability to co-operate after the reform (pct.)

Note: The Chi2-test shows significant differences between generations ($p=0.047$).

Despite small generational differences, the tendency is for young teachers to be most sympathetic in their evaluation of the student ability to co-operate. This result of the reform evaluation is probably explainable by the differences between generations towards social/individual learning.

The conclusion is that a generational poly-culture towards individual and social learning exists two years after the 2005-reform. This is a confirmation of hypothesis 2. The young teachers slowly push older teachers in the direction of new learning values. As the young generation moves faster than the older generations towards

sympathy for social learning, generational divergence (confirmation of hypothesis 4) seems to be the result of the reform, even though all generations move in the same direction.

3.4 Teacher evaluations of the students' learning

What is important to learn in school? The German didactical theorist Wolfgang Klafki distinguishes between different teaching goals (Klafki, 1964, 1976).

The assumption that truth exists independently from the learner's subjective efforts to understand has deep roots in European thinking, for instance in theological realism and scientific positivism. Klafki defines this idea as the theory of material formation ("Bildung"). Klafki's other overriding category is the theory of formal formation. Contrary to material ideas about didactic goals, the ideas of formal formation put focus on subjective forces such as creativity, aesthetic judgement, feelings, problem handling and meta-cognition. According to Klafki, both the material and the formal theory have something important to say, but both theories are problematic as well. In order to point out a modern dialectical position, he uses the concept categorical formation. The teacher must use an epochal and current perspective on the "material" side of learning and, at the same time, he must be aware of the general learning outcome for the students.

The three learning goals may be seen to organize existing ideas among both teachers and researchers. Therefore, it seems adequate to use the concepts to encircle the central ideas of teachers in the upper-secondary schools. At the same time, it is clear that the 2005-reform stresses the importance of formal formation (transfer, meta-cognition, method and study competencies) and categorical learning, for instance in General Study Preparation at the expense of material formation, which has probably been dominant among teachers until now.

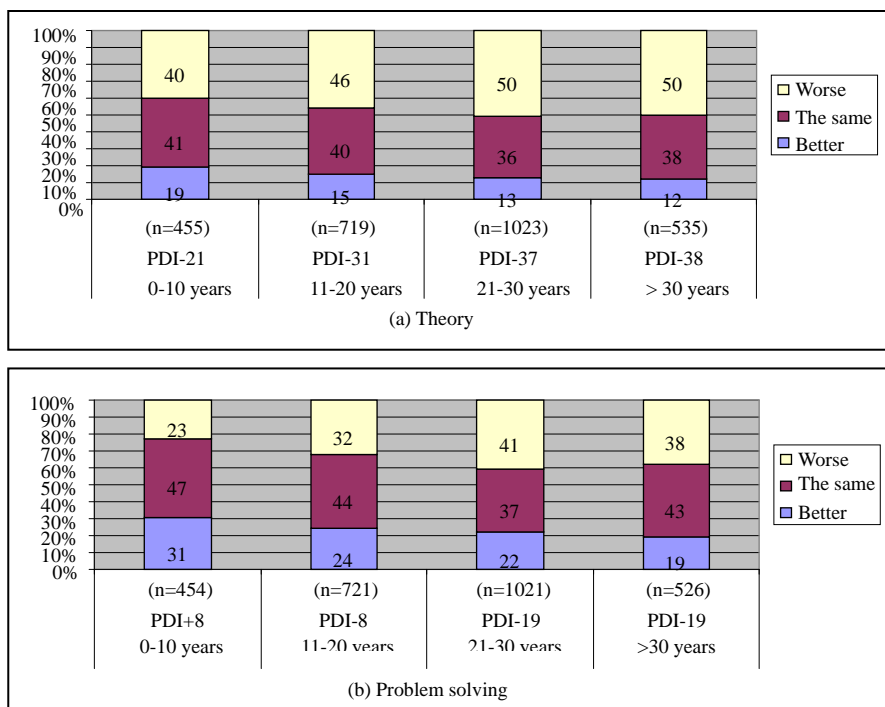


Figure 4 Teacher generations and evaluation of the quality of student learning after the 2005-reform (pct.)

Note: The Chi2-test shows significant differences between the generations when it comes to "theory" ($p=0.002$) and "problem solving" ($p=0.047$).

We asked the teachers to evaluate the quality of student learning two years after the reform. The idea was that

teacher responses would reflect ideas of material and formal kinds—hence making it possible to deduct some generational differences.

The overall picture is that the teachers are rather negative towards the 2005-reform when it comes to the quality of student learning (it should be noticed that we here only have results from 2007, as it was too early to ask the teachers about the outcome of the students learning a few months after the reform changes). There is an overweight of teachers who consider the theoretical dimension of education to have weakened (PDI-score: -34 percent). The PDI-score is also negative when it comes to the quality of the student problem solving (PDI: -12 percent). This indicates that there are more negative than positive reactions towards the reform among the teachers, and also it indicates that the teachers are more negative towards the quality of the “material” part of student learning (learning theory) than of the “formal” part (learning to use).

There are significant generational differences. In the group of young teachers (0-10 years seniority), the PDI-score is +8 percent. When it comes to problem solving, 31 percent of the young teachers find that the students have improved their problem solving abilities, while 23 percent think this competence has decreased since the reform. Among the other generations the PDI-score is negative, covering a difference of 16 and 27 percent point to the young teachers. This indicates a striking generational difference in evaluating the success of transforming the competence discourse into teaching and learning. The young teachers seem to hold the opinion that the students have lost some of the material aspects of the teaching, but on the other hand, they have gained something, namely the ability to use their knowledge. This was unlike with the more experienced teachers where the majority only found losses (see Figure 4).

These results indicate that young teachers identify more with the competence discourse than older teachers do. A generational poly-culture among teachers seems to exist, which confirms hypothesis 2.

3.5 Quantitative conclusion

The result of the three quantitative analyses is not unequivocal. When it comes to the relationship between reproductive and productive learning, there seems to be a consensus between teacher generations. An obvious conclusion is that teachers across generations are “immune” to radical opinions stressing either reproduction or production as the “right” teaching goal. This confirms the common conception, that teaching is a complex matter and that teachers across generations are sceptical towards ideas of teaching of either a very “conservative” or “progressive” kind. This holds for both younger and older teachers, insisting on combinations of reproductive and productive approaches. When it comes to individual vs. social learning, young teachers seem to be an avant-garde, pushing their more experienced colleagues towards a social constructivist practice. In addition, there are differences between younger and older teachers when it comes to evaluating student development after the reform. The young teachers have taken up the competence discourse in a significantly more positive way than other generations. Perhaps this points towards a future where teachers have taken the competence discourse more to their hearts.

4. Young teacher beliefs in a qualitative perspective

Despite the reform intentions, a conflict between ideas and actions does exist. To be a teacher is not only to take a role which is given by the political system, but also to develop a teacher identity which is a result of the habitus of the individual teacher. In this section, the following questions are discussed in a qualitative perspective: (1) Where do the youngest teachers in teacher training learn to teach? (2) What are their teaching values? (3) What

do they think about the relation between theory being learned as a theoretical part of the teacher training and their practice in the schools?

4.1 Theory

What does it mean to be a new teacher? When new teachers begin their career in upper-secondary school, many of them have never taught before. Often they only have teaching experiences from their own student days. When they enter teacher training, they have to combine teaching under supervision at their “own” school and in combination with theoretical courses. In the theoretical courses, they learn about general learning theory, teaching techniques and didactics in their particular subjects.

Traditionally, the practical learning of new teachers has been more like an apprenticeship, where new teachers learned from their more experienced colleagues at the schools. As Wenger and Lave (1991) have pointed out, learning in practice and the concept of apprenticeship is a vital process for the individual learning process. This pattern is also visible in Danish upper-secondary schools.

Research shows (Richardson, 1996) that another traditional source of inspiration comes from the new teacher experiences with their own teachers from past education. They have experience as learners and are necessarily inspired by the teachers they have met when they were students. Lortie (1975) has an interesting point regarding the fact that all new teachers have seen teachers at work much more than they have seen any other occupational group. Drawing inspiration from Bourdieu (1992), he points out that the habitus of a new teacher is to a high degree, a result of experiences from the past embodied in his actual beliefs and practice. According to Hoban (2002), even though teachers are presented with a multitude of ideas about teaching and learning during their teacher education study, they often fall into a repetitive pattern of teaching practice. This seems to confirm that the habitus of a teacher is often more important to his practice than the influence from the teacher education.

In addition, research shows (Hillocks, 1999) that many teachers have difficulty using formal knowledge to change their practice. Therefore, many practical issues dominate teachers’ opinions. If the teachers find new inspiration to teach, they often find it in their practical working context, which is another of Gary Hoban’s points (Hoban, 2002). They seldom use theoretical and research based knowledge for critical examination and reflection regarding their practice.

As mentioned earlier, the last 15 years have seen a shift towards more theories in teacher training. The strategy of the ministry of education has been to challenge the conservative aspects of the socialization visible in the above mimetic forms of learning by accentuating theory and reflection as a means to making new teacher roles possible. Pushed to its extreme, current learning theory accentuates student-initiated project work and competence building by challenging classroom-based and content-oriented teacher roles. As pointed out earlier in this paper, the 2005-reform is not neutral in the discursive “battle” between traditionalists and modernists. The new structures support the modernist approach and are a way to strengthen constructivism and reflection on learning issues, as well as teaching issues. In the introduction, we mentioned that the ideas of professionalization are challenged in upper-secondary schools with ideas about professional pedagogical competencies. Despite the fact that many teachers possess professional knowledge within the subjects he/she teaches, many studies show that professional knowledge will only be a real advantage when it is combined with pedagogical and didactical knowledge (Rasmussen, 2008, p. 12; Schulman, 1987; Dale, 1998). Schulman (1987) also points out that it is very significant that teachers learn to use a knowledge base, which also contains theoretical pedagogical aspects to provide grounds for choices and actions. Today, it is not enough for teachers to have tacit knowledge and do what they have always done or just copy practice among colleagues. The reform points out that teachers must learn to

articulate their practice and examine their reflections critically in teams. All this indicates that the teacher must learn to teach in several ways. Therefore, it is not just enough to learn from practice experiences alone.

For that reason, we find it interesting to examine in a qualitative perspective what the young reform-teachers think about teaching and from where they get their inspiration.

4.2 Inspiration from practice and theory

We asked nine candidates about their inspiration in learning how to teach. All of them stressed that they learn by practicing, speaking with colleagues and observing how others teach:

Candidate III: I think I learn most from my colleagues in practice.

Candidate IV: There is no doubt that I learn most from my practice. You may also study some theories about teaching and learning, but it is not until you are actually in the field, that you really learn the important stuff. I will give you an example. You may pass a theoretical driving theory test, but it is not until you have driven for several years, that you become a good driver.

Candidate II: I do not think that everybody can become a good teacher. Either you've got it or you haven't. However, I also think it is a question of apprenticeship. By this, I mean learning by doing and observing your colleagues' practice. It is important to adapt things from others. Especially from older teachers.

The interviews show that learning-by-doing is a very important factor for candidates. More experienced colleagues work as role models for them. This is the traditional apprenticeship point of view.

Other candidates also find inspiration for teaching in more formal contexts.

Interviewer: Where do you find inspiration for your teaching?

Candidate I: My inspiration comes from the way I was taught in preschool, high school and at the university. Of course, my colleagues and the things we are presented in the pedagogical courses also inspire me. Undoubtedly, the most important factor, indeed, comes from my own experiences when I was a student.

Candidate I refers to both experiences as a learner in school and practical contexts and formal contexts, e.g. university courses and pedagogical courses. It is interesting that there is equivalence between the way the candidates learn and how they think their students learn. It seems as if the formal educational system still has difficulties in changing fundamental beliefs about teaching and learning issues, given that the teachers' own experience as students still plays a major role in the way that they think about teaching and learning issues related to their students.

Not only are role models and former experiences important, but theory and research is also an integrated part of practice. Another candidate also reflects upon theory in relation to the candidate's own practice by referring to constructivism—probably a term being adapted from the theoretical courses in his teacher training:

Candidate II: I believe the idea of constructivism, which claims that people learn by themselves, it is an individual process.

Interviewer: Why?

Candidate II: It has worked for me. I have not been able to learn something until I have tried to figure things out by myself. This is why I like constructivism, because it has worked for me.

Like candidate I, candidate II demonstrates general knowledge about actual theory of learning. This indicates that formal knowledge has made some imprint. This corresponds with the intentions in the reform. We find the same pattern in the interviews with the other candidates.

From a reform perspective, the candidates' relation to theoretical pedagogical thinking is interesting. Here, new theoretical perspectives to teacher work are meant to catalyze new practice. Several candidates express the

opinion that theory is okay if it is usable in practice. As quoted above, candidate IV does not find theory interesting: "...for its own sake...", but only in close proximity to practice. His argument is that you do not learn how to drive a car from theoretical knowledge alone. Theories have to be examined in practice. It is an important point that this candidate points out a logical relationship between theory and practice and does not see them as separate discourses. Moreover, the candidates notice that practice is complex, and theory is not just one that something can be used in a rational technical sense. The practical application determines candidate orientations away from theory and research based knowledge. They are very pragmatic and theory is only legitimate if it can throw light on their practice and combine it with their values.

4.3 Teamwork

One of the goals of the upper-secondary school reform is to improve pedagogical and didactical reflections among teachers. Therefore, an organizational intention of the 2005-reform is to make it possible for teachers to participate in interdisciplinary teams where they can inspire and relate each other. Ideally, the team is a context for the reflective, corporative and innovative teacher. How do the candidates comment on team building in practice two years after the reform was first implemented?

Interviewer: How often do you discuss pedagogical issues with your colleagues, for instance, your students' well-being, interests and learning aspects?

Candidate III: We rarely discuss these things, but sometimes we discuss things related to our subject matter.

Interviewer: Do you often discuss how to improve your practice or what problems you have experienced?

Candidate III: No, we do not discuss these issues.

Another candidate says the same thing.

Candidate II: It is difficult to discuss with colleagues who have a different terminology. For example, there are differences between science terminology and the terminology used in social studies. As I am sure you have heard before, we need a common terminology.

At the team meetings, the candidates and their colleagues primarily discuss the content of the subjects and practical issues. This indicates that, to a large extent, teachers use the new structures (the team) to discuss within the traditional teacher discourse, where the "subject matter" comes before student learning. Teachers do not use the team to improve teaching and to discuss, for instance, ethical dilemmas.

Another candidate focuses on the lack of a common terminology, which could bring teachers together despite their different teaching subjects and science traditions. The barrier seems to be that a content-driven approach makes it difficult to find a common ground for reflection among teachers from different faculties. One problem could be that while young teachers, during their teacher-training program, have acquired a pedagogical vocabulary, many of their more experienced colleagues have not. This may explain why focus in the teams is primarily on the taught subjects and not general pedagogical questions, which probably makes it difficult for new teachers to bridge theoretical and practical learning. An overall point is that the lack of generally accepted pedagogical terminology explains why teams based on subjects from the same faculty are often favored at the expense of cross-faculty teams integrating teachers with subjects from the humanities, social science and natural science.

4.4 Qualitative conclusion

Despite the existence of formal teacher educational programs, researchers often claim that teachers seldom bring new theoretical perspectives into their practice. Nevertheless, our qualitative studies indicate that young teachers are aware of ideas of constructivism and find some inspiration from their theoretical courses. They combine this inspiration with inspiration from role models in the past (their own school teachers and professors at

the university) and in their present situation (other teachers and team colleagues). What seems to be a problem, in order to create synergy effects between theoretical and practical teacher education, is the fact that three years after the reform, teams do not seem used to discussing general pedagogical, didactical and ethical issues, which was one of the reform intentions. New teachers find it manageable to discuss with colleagues whose subjects are related to their own, but-like their older colleagues-they find it extremely difficult to discuss across disciplinary boundaries.

As we have underlined in our analysis of the quantitative data, it is important not to exaggerate differences between the generations. On the other hand, young teachers seem to be more positive than their older colleagues, towards certain elements of the current reform-for instance the competence discourse. What seems very important is to build bridges between the theoretical discourse being learned in the theoretical part of the teacher education and the practical teamwork, which occurs in relation to actual classes and students. It seems that the substance of teamwork in the reformed school is a cardinal point for the development of young teachers' values: Will they be able to find a platform to develop their ideas or will they be integrated in a teacher culture being resistant to the ideas of the reform? A very important "point of no return" in this process seems to be the way that teams develop a new practical pedagogical language covering issues such as cross-curricular teaching, competence building, meta-cognition etc. How young teachers will develop their ideas about teaching and learning is not up to them alone, but also depending on the organizational context in which they participate.

5. Conclusion: Triangulation and perspectives

Our first research question was: How do young teachers and their older colleagues respond to the intersection between reform and school culture?

Quantitative data analysis shows that in some respects young teachers are more reform friendly for reform than their older colleagues. They find it important that their students not only learn how to gather knowledge but also how to use and thoroughly understand this knowledge. In addition, the ideas of social constructivism seem to play a greater role for new teachers. On the one hand, there are no significant differences between teacher generations when it comes to prioritizing reproductive and productive learning. On the other hand, young teachers are more positive towards a social constructive point of view, stressing student competencies. This does not mean that they wish to promote inductive learning approaches such as project work at the expense of "traditional" classroom teaching. Among the generations, there is a shift in balance between elements of learning and teaching, but the shift is not very significant. When it comes to the quantitative analysis, our moderate conclusion is that even though the young teachers are, in some respects, more sympathetic towards the 2005-reform than their older colleagues, the difference between generations is not big.

There seem to be mechanisms in new teachers' approaches to the profession which makes them less supportive to change than the thesis about big differences between generations. In our interviews, we have focused on some of these mechanisms and at the same time investigated new teachers' ways of approaching the new school structures, especially team work.

The second research question was: Where do the coming teachers find inspiration as teachers and how do they relate to teacher co-operation in teams?

Our interviews show that the new candidates find inspiration to teach in several contexts. In spite of the fact that new teachers find some inspiration to teach in the formal teaching field, their personal beliefs and their own

experiences as students seem to have a great influence upon the way they teach. The young teachers' habitus with its combination of past experiences and present beliefs seem to be a very important condition for their approach to the teacher work. In addition, the candidates have a pragmatic approach to theory: It must be useful. Teachers mainly gather new inspiration for teaching in practice.

Finally, the teams only seem capable of developing the teachers' didactical and the pedagogical competencies to a certain extent. They miss a common terminology, which would permit them to communicate across the different disciplinary traditions. Perhaps this is the problem.

The question is whether it is enough to rely on the coming teachers and on their ability to bring a new pedagogical terminology into the schools, which may have an impact on their older colleagues? Our quantitative and qualitative studies show, in some cases, that the younger teachers are in some—but not every—respect reform more friendly than their older colleagues. Only time will tell if this will last, and if they will become “different gatekeepers” of the teacher culture when integrating new teachers in significantly different than their older colleagues.

The above mentioned quantitative analysis shows that the younger teachers are in some ways more reform-minded than their older colleagues. On the other hand, this is no guarantee for a radical change in the educational reforms of upper-secondary school. Although the candidates have had introductions to the new reform and to modern pedagogical theories during the theoretical part of their teacher training, it seems obvious that this can be very superficial if fundamental teacher beliefs and assumptions do not change at the same time. The reason is that teacher beliefs have a great influence on practice and the possibility to change things (Pajares, 1992, pp. 317-322). Therefore, it is very important to challenge these beliefs in a critical perspective. If teachers wish to improve themselves and their practice, they must replace tacit knowledge with explicit knowledge for use in teams. Theoretical and conceptual thinking can be such a knowledge, which makes it possible to discuss pedagogical issues in teams. The Danish Professor, Lars-Henrik Schmidt (1999) advocates a more practice-oriented form of knowledge, which is sensitive to the complexity of teaching and learning (for an attempt to create practical pedagogical tools being substantiated in theory, see Beck, 2008). For instance, it has been mentioned that teachers must be able to conceptualize practice to be able to speak about it in teams. This could be called a decentering strategy, allowing new perspectives to be investigated and traditional assumptions to be reflected upon in critical ways. This is not the same as rejecting the apprenticeship dimension. Rather, this dimension of teacher training and socialization seems to be universal and very useful. On the other hand, teachers have to be familiar with different perspectives that can guide them in their daily work and make it possible for them to see what they could not see before. Such reflections will allow teachers—especially new teachers—trying to find their own voice to learn from their own experiences or from role models, but also to be professionals with the ability to reflect and challenge his or her own assumptions, believe and perhaps even change his or her own practice as a teacher.

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Appendix:

The categorisation of the teachers into three groups (positive, neutral, negative) is based on their answers to a scale of statements going from “weak” to “strong” (Zeuner, Beck, Frederiksen & Paulsen, 2008, p. 317 ff). The individual teacher's position is defined by assigning a score in relation to each question. The positions “positive”, “neutral” and “negative” are found by assigning “points” to the respondent (1=total disagreement, 2=predominantly disagreement, 3=predominantly disagreement, 4=total agreement. For instance, the category “negative” will be used if a respondent, in relation to a theme with four statements, achieves a score of 8 (4×2 or less).

Here are themes and statements.

Statements about reproductive and productive learning

Statements indicating preference for reproductive learning:	Statements indicating preference for productive learning:
Students must adapt knowledge developed through many generations.	Students must learn to discuss the already existing thinking.
It is important that the students learn the basic elements of the subjects.	Students must be able to develop new forms of thinking.
The primary goal of teaching is to make the students capable of reproducing theories and methods within the subject.	The basic structures of science are not permanent. Students must learn to think in changing structures.
Young people must first take over already existing ways of thinking within science.	In the future, only the ability to create new thinking counts.
	The teacher has to break down the conventional forms of thinking and teach students how to think new and different.

Statements about individual and social learning

Statements indicating preference for individual learning.	Statements indicating preference for social learning
The teacher must allow students to work individually.	Students have to learn how to work together with both teachers and other students.
Students must have opportunities to work alone.	When the students work together they support each others' personal and intellectual progress.
Students will learn most, if they work alone most of the time.	The teacher must primarily use work methods providing time for cooperation between students.
Students should first and foremost present their work individually.	Students are most efficient when they work together.

The quality of the student learning

Since the 2005-reform, have the students improved or decreased in the following:

- To learn the theories of the subjects
- To solve problems
- To co-operate