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How Teachers and Principals Enact the Policy of Building Education in Sweden on a Scientific Foundation and Proven Experience: Challenges and Opportunities

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ABSTRACT
In 2010, Sweden was the first country in the world to introduce a legal requirement that education should be research-based, placing huge demands on schools. The study’s aim is to explore how, through sensemaking, teachers and principals enact this policy in schools. In total, 272 teachers and 23 principals from pre-schools, leisure-time centers, compulsory schools, and upper secondary schools completed a questionnaire.

The findings show the need for understanding central policy concepts, alignment with previous experiences, and a social context within which the policy can be understood, negotiated, and enacted. Policy enactment was dependent on the support given – professional development, time, and financial resources. Teachers and principals have so far experienced challenges and opportunities – a rewarding if complex process.

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Education policy; research-based education; policy enactment; teachers’ professional development; principalship

Introduction
Integrating research into teachers’ work and school on a general level, i.e., the need for teachers to apply evidence from research and their past practice into their teaching as well as lead and collaborate in practitioner inquiry processes is an educational policy that has spread from the US and UK to the Scandinavian countries and the rest of Europe (Brante, 2014; Caena, 2014; Cain, 2015; Skagen, 2006; The General Teaching Council for Scotland, 2012). Research-based education is designed to increase the quality of the education system in each country: raising teacher professionalism and producing better student results (OECD, 2018).

Research-based education in Sweden can be seen as an “old” question, problematized in previous literature (cf. Biesta, 2010; Brown, 2017; Carlgren, 2015; Englund, Forsberg, & Sundberg, 2012; Levinsson, 2011). However, what is new is that Sweden in 2010, the first country in the world to do so, introduced a legal requirement that education should have its foundation in science and proven experience (Swedish Government, 2010, p. 5§, 2018). With this, the government significantly increased demands on teachers and principals, forcing them to find ways to build research-based
education (Hansson, 2014; Kroksmark, 2014). However, on closer inspection, it can be seen that what at first seems to be a weighty demand was actually framed in a rather vague way, and it was left to education authorities and actors at a school level to decide how to enact it in practice. Rapp, Segolsson, and Kroksmark (2017) show that the government has taken a highly authoritative and top-down position in defining the ideological foundations and the concept definition. When it comes down to carrying out however, although the teachers are familiar with the requirements they make widely different interpretations of the concepts and few of them have strategies for implementing research-based knowledge. Kroksmark (2014) and Wennergren (2016) argue that a part of the enactment should be that the profession itself defines and interprets the meaning of research-based education. Wennergren and Åman (2011) conclude that end-users have not been given the tools to interpret or understand the act. Teachers’ perception and interpretation of school assignments take place gradually over time in a process that builds formulations, reformulations, and negotiations in a community of practice with researchers.

These aforementioned policies and studies indicate that it is a contemporary and growing area of interest. Using the Swedish policy of building education on a scientific foundation and proven experience as an illustrative example of policy enactment, the aim of this study is to explore how teachers and principals enact the policy in schools (i.e., how they deal with the policy), based on their sensemaking of the policy intention. We seek to study their experiences and meaning-making when enacting the policy, and their perceived challenges and opportunities as well as the support and the professional development they need in order to enact the policy. The research questions are: How do individual, social, and structural factors affect teachers’ and principals’ sensemaking and enactment of the policy of building education on a scientific foundation and proven experience? How do these factors hamper or promote the enactment and what differences and similarities between teachers’ and principals’ understandings and experiences can be found?

**Two Patterns of Conceptualizations in Research-Based Practice**

Research-based practice can have two different conceptualizations (Levinsson, 2013; Wollscheid & Opheim, 2016). On the one hand, evidence-based practice entails that the education should be based on systematic reviews of “what works” and “best practice”, generated through effect studies, randomized controlled trials, etc. The use of research evidence in teaching is supposed to improve student results. Although it has been promoted in education policy it has been criticized for following procedures in the medical context, not adjusted to education (Levinsson, 2013). To focus on evidence-based practice can be aligned with a rationalistic view of how education should be governed, which can be associated with New Public Management (NPM) (Ball, 2009a; Noffke & Somekh, 2013). This type of governance involves extended control by the state, while at the same time processes of reduced teacher professional autonomy and de-professionalization take place (Ball & Junemann, 2012).

On the other hand, evidence-informed practice implies using research results in education based on both qualitative and quantitative methods, experiences, and contextualized knowledge. Teachers’ professional judgment and practical knowledge are emphasized (Levinsson, 2013). This conceptualization stresses that teaching is a complex process where one-size-fits-all solutions are not possible. Development and improvement come from the teachers themselves, from the “bottom” (Cordingley, 2004; Levinsson, 2013).

Based on the Swedish policy statement, there could be different ways to achieve a research-based education. On the one hand, the Swedish National Agency for Education claimed that “a scientific foundation and proven experience” should be equivalent to evidence-based practice, and that teachers’ experience-based knowledge, if accepted as proof of this, should be documented, spread, and verified by a number of different teachers (The Swedish National Agency for Education, 2012a). Teachers are expected to be research consumers and implementers of research into school practice. On the other hand, the Swedish National Agency for Education (2018), also suggests that the demands in the Education Act can be understood as evidence-informed practice, where
teachers act as active agents in research processes in the school. Accordingly, the Swedish legislation does not promote just one of the concept’s practices (research-based or research-informed), but both.

**Theoretical Framework**

The theoretical framework builds on policy enactment and sensemaking. Policy enactment can be related to policy implementation and the two terms will be explored. Historically, policy implementation research has been occupied with the question of fidelity to reform, showing that implementers rarely implemented the reform as intended by the policy-maker and therefore failed to implement the policy (Honig, 2009). This interpretation of policy implementation, which Spillane (2000) terms as “conventional” accounts of policy implementation, indicates a “top down” perspective where the implementers of the reform are viewed as “passive recipients or mere implementers of top-down policy decisions” (Tan, 2017, p. 589). Maguire, Braun, and Ball (2015) claim that research which explores policy implementation, often in the shape of “outcomes-driven” studies, results in a limited perspective as it does not explicitly address questions that teachers and principals struggle with when implementing policies (p. 486). In policy enactment, teachers and principals are viewed not solely as subjects but also as agents of translating policy into practice, emphasizing the importance of engagement in this process (Ball, Maguire, & Braun, 2012; Ball, Maguire, Braun, & Hoskins, 2011; März & Keltchermans, 2013; Tan, 2017). A policy is not set in stone, it requires negotiating and meanings need to be constructed and interpreted. Only then can the policy be realized in both teaching and leadership (Weick, 1995). Policy enactment can be viewed as a reciprocal process, wherein the policy and the interpreter mutually affect each other (Spillane, Reiser, & Reimer, 2002). An enactment process is not a simple process, but instead a rather complex interaction between the content, the context, the actors’ sensemaking, and the translation of the policy into teaching and leadership (März & Keltchermans, 2013).

Honig (2009) states that theories of implementation have changed over time, from being the top-down and linear process, not taking the context into account, as described above, to being context-sensitive, exploring different dimensions and how and why interactions within these dimensions affect the enactment. The direction in which policy implementation has moved, Honig (2009) argues, will enable research to “confront the complexity of policy implementation” (p. 339). As we see it, this move within the policy implementation has similarities to how policy enactment is understood, but still the two concepts are not the same. Maguire et al. (2015) claim that policy enactment is, compared to policy implementation, “a theoretically richer concept which better captures the multifaceted ways in which policies are read alongside/against contextual factors, by different sets of policy interpreters, translators and critics” (p. 487). This study contributes to a specific part of critical policy research, “the governance turn”, with interest in the governing logics of practice (Ball, 2009b). In the following, different factors affecting policy enactment will be presented, as they are central analytical tools in the analysis of our empirical data.

**Individual factors** affecting policy enactment involve teachers’ and principals’ sensemaking of an initiative and how this relates to the way a policy message is interpreted and negotiated (Coburn, 2001; Weick, 1995). Moreover, sensemaking is a process to “resolve ambiguity and manage uncertainty” (Allen & Penuel, 2015, p. 137), which can relate to, for example, conflicting goals, an absence of measures to evaluate the success of the policy, and limited resources for enactment. How teachers and principals learn about, understand, and enact a policy relates to their existing beliefs, knowledge, and experiences. Teachers and principals draw on their previous experiences when understanding and enacting policy (Coburn, 2005; Spillane, 2002; Weick, 1995). Coburn (2006) emphasizes that sensemaking theories have focused on “shared meanings and collective understandings” and not on exploring differences in understanding and contestations (p. 346), which can be seen as a theoretical weakness. To address this limitation, this study attempts to study teachers’ and principals’ diverse understandings.
Also, social factors impact the enactment (Coburn, 2005). These relate to social interaction and the context of the organization, affecting teachers’ and principals’ learning and enactment of a new policy (Spillane, 1999). In addition, opportunities for professional development and learning relating to the reform play an important role (Coburn, 2001). Teachers and principals exchange interpretations of policies in connection to their goals and practice through interactions with each other – in professional learning communities for example (Stoll, Bolam, McMahon, Wallace, & Thomas, 2006).

Besides individual and social factors, structural factors also affect how teachers and principals respond to new policies. These factors involve what kind of support is offered and the degree of participation in decision-making relating to the enactment (Spillane et al., 2002). Structural factors might also involve to what degree the organization is changed during policy enactment, for example, roles and procedures (März & Keltchermans, 2013). Principals play a pivotal role in understanding teachers’ views, knowledge, and beliefs, supporting the building of social networks and constructing the setting of the organization supporting the enactment of the policy (Hansson, 2014). Principals create conditions for teachers’ sensemaking and enactment of policies by offering sufficient resources (e.g., time) for qualitative professional development and their own engagement in the process (Coburn, 2005). Principals might bring in and prioritize certain parts of the policy and also the opposite, play down other aspects that are not relevant, protecting staff from demands outside of school (Coburn, 2005). This reflects the diverse roles principals can have, from gatekeepers and buffers to enablers and facilitators. Finally, when enacting a policy, the role of a district office is also an organizational factor. The responsibility for different school improvement initiatives – for example, reading instruction – can be split between separate units of the district office, sometimes resulting in “multiple and contradictory understandings in the same office about the same policy”, which might hamper the enactment (Spillane et al., 2002, p. 408). However, a district office might also actively help an enactment process through the various types of support it offers to teachers and principals, for example, professional development initiatives.

**Methodology**

**Context of the Study: Participants and Data Collection**

In this study we aimed to look at teachers’ and principals’ work in a municipality which was making a strategic effort to create supportive structures for policy enactment. As a result, we carried out this study at a specific municipality in Northern Sweden that met our selection criteria. This municipality represents a “smaller town/urban area and rural municipality” (SKL, 2019) in Sweden with about 42,000 inhabitants. The municipality is just starting the process of enacting this new policy. Compared to the national school context, this municipality is quite unique in its variety of strategies to enact the policy, on different levels, directed at teachers and principals. The work of the municipality has gained attention and interest from other municipalities in Sweden. It should be noted that there are many other municipalities in Sweden creating strategies for supporting the enactment of this policy, although they might not show the same range of strategies and deliberative action as this particular municipality.

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3In our study, this refers to the central education department of the municipality.
4Example of supportive structures: a research and school development strategy has been adopted by the education board, a scientific leader position has been established (the second author) and a scientific education board with the aim of creating strategies for and supporting scientific activities and professional development has been introduced. In addition, in collaboration with a university, a master program in education focusing on educational research and school development, is also offered and the municipality has engaged an in-house researcher, studying and supporting the policy enactment (the first author).
5From the 1990s, Sweden has had a decentralized school system which is managed by objectives, where governance and decision-making are given to the 290 municipalities and their local politicians. Therefore, a municipality has considerable scope for action and responsibility to achieve the goals for education that the state has stipulated. As a result, municipalities show a variety of strategies and support offered to, for example, enact this policy of building education on a scientific foundation and proven experience.
The first author informed the principals orally about the study and they passed on this information to the teachers. After that, the researcher invited all participants via email. Participation was voluntary, the answers would be dealt with confidentially and termination of participation was possible if requested. Participants were teachers and principals from pre-schools, leisure-time centers, compulsory schools (pre-school class – 3, grades 4–6 and grades 7–9), and upper secondary schools. In total, 272 teachers (22% of the teachers of the municipality) and 23 principals (52% of the principals of the municipality) agreed to participate. Table 1 shows a wide representation of different teacher and principal categories.

This paper reports on a study using questionnaires with closed and open-ended questions (see Appendix) to answer the research questions regarding teachers’ and principals’ enactment of the policy of building education on a scientific foundation and proven experience. When a study aims to explore specific characteristics of a large number of people and to achieve an overview of a phenomenon, a survey study is appropriate (Jaeger, 1988). One specific method within the field of surveys is questionnaires. As we wanted to build a picture of a large number of teachers’ and principals’ general views on the researched phenomenon (not aiming for in-depth experiences uncovered in interviews), we chose questionnaires. The decision to use both closed and open-ended questions was taken as responses to closed questions are easy to categorize, building on the options the participants have selected, and open-ended questions may allow for new aspects to appear not expected by the researcher (cf. Bailey, 1994). Even though we used questionnaires, we regard this as mainly a qualitative study, as the open-ended questions were the main part of the questionnaires.

The questionnaire was used to grasp understandings of central concepts relating to the policy, such as scientific foundation and proven experience (concepts used in the Education Act). Moreover, the concept scientific approach was also included, since it has been associated with the two other concepts and is also used in interpretations of the policy (Swedish Government, 2018; Swedish National Agency for Education, 2012a). The statements that the participants could reflect on in the closed questions were based on existing understandings of a scientific foundation, proven experience, and scientific approach (cf. Kroksmark, 2014; Ryve, Hemmi, & Kornhall, 2016; Swedish National Agency for Education, 2012a). The teachers and principals could choose one or more alternatives which they regarded related most closely to their understanding. The closed questions were always accompanied by an opportunity to give an open-ended explanation.

After reflecting on the concepts, the participants were invited to give open-ended explanations of practical applications of the same concepts reflected on in the closed questions: scientific foundation, proven experience, and scientific approach. In addition, they gave examples of opportunities and benefits as well as challenges and dilemmas relating to enacting the new policy and what support and professional development they perceived they needed. Accordingly, the questionnaire was designed to explore the concepts from the legislation and the interpretations given by the Swedish National Agency for Education as well as their application in teachers’ and principals’ practice.

We acknowledge that the chosen method of questionnaires gives general and potentially limited answers, as we were unable to help the participants to clarify the questions if necessary, to pose follow-up questions, or collect additional information (cf. Bryman, 2011). Alerby and Kostenius (2011) argue that questionnaires can limit the participants’ opportunity to freely express their views and experiences, which means that some people are not heard when this type of empirical method is used. Bryman (2011) describes how qualitative data in questionnaires can illustrate and explain quantitative data. In our study, the participants were able to reflect freely in the open-ended parts.

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6 Of the teachers, 71% of them have worked more than 10 years, whereof 26% have more than 20 years of teaching experience. Almost half of the principals, 48%, have worked 5–10 years as principals and 22% have 10–20 years principal experience. These percentages show that the participants were in general quite experienced and many have extensive experience of working as teachers and principals.

7 On the question of how they enact the policy, the teacher responses were on average 65 words and 21 teachers out of 272 responded with only a couple of words, for example: ‘don’t know’, ‘don’t have time’ or ‘?’. The principal responses were on average 35 words.
of the questionnaire, which can be considered as a strength in this case. A majority of the participants used the free space to give additional and clarifying reflections. Therefore, the answers on the open-ended questions deepened the understanding of the quantitative data. Despite the potential weakness of questionnaires, we regard our choice of method and description of procedures sufficient in order to meet the aim of the study.

Regarding transferability of findings from this study, it is important to emphasize that the research was conducted within a municipality that had made a strategic effort to create supportive structures for the enactment of the policy in question. What consequences might that have for the findings? Are they representative of Swedish schools as a whole or solely a local phenomenon? In order to bring findings from a local level to a more general level, they have been analyzed in comparison to research and theory in the fields of policy enactment and sensemaking. Accordingly, the findings can inform the processes of enacting policies on research-based education in national and international contexts.

**Data Analysis**

As we regard this study as mainly a qualitative one, the quantitative findings on the closed questions will solely be reported as percentages of the most and least frequently used answers, giving an initial general overview of the central concepts. This was intended, as it serves as a springboard to the findings of the open-ended questions, where the content analysis was used (cf. Graneheim & Lundman, 2004), with research questions guiding the steps of the analysis. Data analysis was conducted to define the meaning of empirical data. First, both authors read all the qualitative data and defined the unit of analysis to be teachers’ and principals’ sensemaking and experiences of the enactment of a new policy. To narrow the analysis, the units of meaning were defined as the central concepts, application in teachers’ and principals’ practice, challenges and opportunities as well as support and areas of professional development. These phases helped us to condense the data. In the abstraction phase, emerging themes were formulated, where the first theme addresses teachers’ and principals’ diverse understandings of the central concepts and the second involves application in teachers’ and principals’ practice, challenges and opportunities as well as support and areas of professional development. We sought to find patterns in responses on a collective level, thus we compared the two groups – teachers and principals. Based on the aim of this study, we wanted to generate an all-encompassing picture of how teachers and principals interpret and enact the policy in their practice. We did not
attempt to find correlations between the understandings, but rather to elucidate different logics and discover what understandings dominated, as well as differences and similarities between teachers and principals.8

Findings

The analysis resulted in two themes, _Scientific foundation, proven experience, and scientific approach – interrelated but separate concepts_ and _Building an education based on a scientific foundation and proven experience – a rewarding but complex task._

**Scientific Foundation, Proven Experience, and Scientific Approach – Interrelated but Separate Concepts**

**Scientific Foundation**

The findings on the closed question of understanding a _scientific foundation_, revealed the following division (see Table 2).

Teachers. A scientific foundation related to knowledge coming from outside, i.e., results produced by university researchers, and involved both the _what_ and the _how_ question. A scientific foundation can be described as a kind of _state-of-the-art knowledge_: “As it stands today, we feel confident about facts and phenomena in different subject areas, but we are always alert and open for new findings and fields of research.” The state-of-the-art knowledge related mainly to _subject content_, _pedagogical content knowledge_, and _pedagogical knowledge_: “I teach Biology and related subjects that really demand that I keep up-to-date on what happens in the scientific research in these subjects” (exemplifies _subject content_), “reading methods that have been shown successful in research” (exemplifies _pedagogical content knowledge_) and “how students are treated through the low arousal approach, positive reinforcement and inclusion of all students” (exemplifies _pedagogical knowledge_).

The question of _how_ also related to the ways in which teachers access scientific knowledge. For example, through their academic training:

I think that a scientific foundation implies that we as teachers have an academic training, which gives us a scientific base to build on, that we can reflect on our practice through a scientific perspective (by learning from research and analyzing the practice with the use of scientific methods) and that we teach our students a scientific approach (including critical review).

Teachers can also access research through continual professional development, for example, reading literature from university courses and collegial learning within school. They can pick up on research through “continual professional development of, for example, reading and special education, organized by the Swedish National Agency for Education”.9

The teachers can be kept up-to-date on research from different sources, for instance, through reading research literature such as scientific papers, dissertations, research reviews, and books. “I read research reports from the Agency for Education” and “I keep myself updated on educational research through literature, such as scientific and popular science papers.”

A scientific foundation is used by the teachers as a way of distancing themselves from their immediate teaching when reflecting on practice in the light of research. “When we design our teaching, [we] consider research and use that as support when we plan and develop our teaching. But we should remember to critically review what we read and not just buy into the thoughts outright.” Thus, the scientific competency of critically reviewing was interwoven with teaching strategies. In

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8We did not seek to explore differences within the groups, since that was not part of the aim of the study. The sample shows a wide representation of teacher and principal categories, which offered a broad perspective of the topic at hand.

9The Swedish Agency for Education has launched a number of professional development initiatives over recent years, in areas such as, for example, Swedish (reading), Mathematics, and Special Education, which many of the teachers in this municipality have participated in, as described in their reflections.
their responses teachers showed links to the other two concepts. There were some examples where a scientific foundation and proven experience came together, for example:

In my teaching of Swedish as a second language, we use working forms that develop both language and knowledge about a subject (scaffolding language and scaffolding learning), which I consider is supported by both research and my experience, which I and my colleagues at school and also in the extended collegial body of teachers [beyond our own school] find is the best way for students to develop.

**Principals.** For principals, a scientific foundation involved keeping up-to-date on research and implementing the findings in school practice. One principal wrote: “When it comes to a scientific foundation, I try to keep up-to-date with contemporary research and implement it in our practice, for example, in conversations when projects begin.” Here, a scientific foundation is knowledge that is generated outside the immediate school context, from a university, something which the teachers also emphasized. The scientific foundation related mainly to pedagogical knowledge and organizational knowledge: “I have studied theories about learning, motivation, conversation methods, for example… I try to use what I have read together with the successful factors that are brought forward in research” (exemplifies pedagogical knowledge) and “I analyze my being and action as a principal along with the different practices [that I am responsible for] in relation to different theoretical perspectives and approaches … [through the scientific foundation] I possess additional knowledge about leadership and school development” (exemplifies organizational knowledge). There were few examples of a scientific foundation in the areas of content knowledge and pedagogical content knowledge.

It is not only the research findings that principals have to know, but they must also understand theories and research processes – for example, “my own knowledge about different scientific theories, traditions, and origins”. The principals also problematized the concept of a scientific foundation, sometimes there is no previous research on a specific topic: “It is hard to determine if there is a scientific foundation for all the tasks that a principal has.” The scientific foundation can also be understood as being in a change process due to new research findings that impact the school practice: “The organization I lead includes newly-arrived immigrant students, which means that the school practice is in constant change based on new research findings, new experience, and new policies.”

There could be different ways to access research. One principal wrote: “I find research and new findings in journals, reports, literature, courses, and on the Internet.” Other principals also mentioned these diverse sources to access research, which are the same sources teachers use.

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**Table 2. Teachers’ and principals’ understanding of scientific foundation.**

<table>
<thead>
<tr>
<th>How do you interpret the concept scientific foundation?</th>
<th>Teachers</th>
<th>Principals</th>
</tr>
</thead>
<tbody>
<tr>
<td>To build the education on science, both content and methods</td>
<td>80%</td>
<td>50%</td>
</tr>
<tr>
<td>Staying updated on research</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>Critical review, source evaluation</td>
<td>40%</td>
<td>30%</td>
</tr>
<tr>
<td>Open-ended explanation</td>
<td>20%</td>
<td>10%</td>
</tr>
</tbody>
</table>
As in the case of the teachers, the responses from the principals also showed an overlap between a scientific foundation and a scientific approach. “The scientific foundation and scientific approach are constantly at the back of my mind in all my day-to-day work, even if I don’t always consciously think about them.” It seemed to be hard to separate the two concepts, especially when they described and gave examples from their practice on policy enactment.

Proven Experience
The findings on the closed question of understanding proven experience revealed the following division (see Table 3).¹⁰

**Teachers.** The answers on the open-ended questions resulted in a deepening of the understanding of the concept. They emphasized teachers’ own teaching experience, the collective teacher experience, and systematically documented and evaluated experiences (the definition by the Swedish Agency for Education), which resulted in teachers’ evaluating their own and their colleagues’ experience in a more positive way. One of the teachers reflected specifically on the definition by the Agency:

It’s interesting with proven experience, I was totally devastated when I read the definition from the Agency of Education. I consider that the experience I have acquired and tested over and over again, reflected on and accordingly adjusted and developed, is proven!

Based on the teacher responses, proven experience involved knowledge coming from inside the organization, created by individual teachers or by groups of teachers, principals, and students. They regarded an experience as proven even if not documented in writing and spread outside their own school – although the experiences must be reflected on, evaluated, and documented (although orally is good enough) within professional learning communities in their school.

A combination of the different alternatives described above. For me, proven experience can be both what I carry with me and what my colleagues and my pre-school bring, but also what others outside do. However, I think it should be documented and reflected on, and be more than just a feeling I have, but I do not think it has to be based on something that is documented and evaluated by pre-schools over a long period of time and then spread to others.

¹⁰The prevailing definition of proven experience that the Swedish Agency for Education endorses is the third alternative “Systematically documented …” It was not highlighted in the questionnaire that this was the understanding from the Agency. Though, it seems that this understanding has reached the teachers and principals and clearly impacted their interpretation.
Teachers’ understanding of proven experience challenges the definition by the Swedish Agency for Education, when they question the need to document the experience in writing and spread it outside the immediate context. However, the proven experience must be based on more than just a feeling.

**Principals.** In the open-ended responses, the definition by the Swedish Agency for Education was reinforced, contrary to the teacher responses, when the principals emphasized that if knowledge is to be viewed as proven, it needs to be systematically gathered, reflected on, evaluated, and then spread outside the immediate pre-school or school. Two principals wrote: “Proven experience is about professional experience, experience that teachers share with each other in a systematic way that is then documented and spread” and “The experience should not be limited to the individual organization, otherwise it will result in a narrow approach.” Proven experience was also about elucidating tacit knowledge within an organization. “I try to find ways to illuminate and recognize issues, putting words to common knowledge together with my staff. The organization rests on sound experience, but it is not proven and often hidden within every individual’s knowledge.”

There were fewer comments on the concept proven experience than the other two concepts. Based on the comments it seems as though the concept is more highly associated with teaching than with leadership and therefore in need of exploration from a principal perspective. “Proven experience is harder to say something about, there is little to build on, a relatively new concept that is supposed to be applied in a school.”

**Scientific Approach**
The findings on the closed question of understanding a scientific approach, revealed the following division (see Table 4).

**Teachers.** A scientific approach was understood as application of research results in teaching, involving, for example, critical review and active decisions regarding what research to implement. “A scientific approach also helps me to screen research results and define which ones are relevant for me to put into practice.” The teachers’ contextual knowledge is important when applying research results in teaching. “To stay updated on research and advances in education and at the same time adapting this to the teaching situation and, in fact, also being critical of research.” In the process of evaluating what research to apply, research results are mirrored against previous teacher experience and knowledge, and when found relevant, the teachers implement the results in their teaching. This implies that the teachers are not implementing research in an unreflected way and for its own sake, it should have a bearing on and be of benefit to the teaching. A scientific approach is connected to Systematic Quality Work (SQW).

Systematic reflection on scientific decisions is made in practice. This happens daily, weekly, and yearly in the SQW. Based in practice, you take a stand based on contemporary research concerning methods, approaches, and knowledge. The collegial reflection gives an indication of areas of improvement and success factors. You bring these lessons learned to the processes when developing practice.

Moreover, as described earlier, there were examples of an overlap between a scientific foundation and scientific approach, where the concepts were used interchangeably.

**Principals.** The principals have similar thoughts on the concept scientific approach as the teachers. As they see it, it involves systematic reflection, critical review, and evaluation. “When it comes to a scientific approach, we try to have an ongoing dialogue with an exploratory approach where we twist and turn our thoughts and taken-for-granted opinions.” The principals wish to create an investigative environment where the practice is problematized by using a scientific approach. Scrutinizing the organization is preferably done in the Systematic Quality Work:

In the different parts of Systematic Quality Work, I try to expand the knowledge of the organization, by including scientific perspectives which often give other answers to the questions of the organization than the answers that the staff of the organization give.
According to the principals, the goal of SQW is to improve the organization, based on identified needs in different areas. It is stressed that SQW based on a scientific approach gives opportunities for substantiated decisions which foster long-term change, as opposed to a somewhat unreflected quick fix.

**Building an Education Based on a Scientific Foundation and Proven Experience – A Rewarding but Complex Task**

**Opportunities and Benefits**
The findings on the closed question of understanding opportunities or benefits of working with research in school, revealed the following division (see Table 5).

*Teachers and principals.* Both groups perceived that research can impact positively on developing the teaching profession and the principals’ leadership and that it can improve the education as well as elucidating tacit knowledge. Working with research in pre-schools and schools from a bottom-up perspective makes the research meaningful and contemporary: “The research becomes more relevant, since it starts with the problems I face as a teacher” (open-ended teacher reflection). Working in a research-based manner might therefore contribute to elucidating school experiences from within. The teachers have a higher expectation that research-based education will contribute to the organization improving its achievement of goals and raising the status of the teaching profession than the principals have. “It [the research] visualizes results and might show success factors that exist within the organization” (open-ended teacher reflection).

The teachers also have higher expectations than principals in other areas as well: influence on and confidence in the work, cooperation with colleagues and the courage to try new things. The principals’ leadership, including their expectations, can facilitate or hinder the teachers’ opportunities to build an education based on a scientific foundation and proven experience as required by the state.

**Challenges and Dilemmas**
The findings on the closed question of understanding challenges and dilemmas of working with research in school, revealed the following division (see Table 6).

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11The results of teacher and principal responses are presented together as the open-ended responses were fewer relating to this aspect, especially the principals’ answers.
Teachers. The teachers found the policy of research-based education both interesting and important, but there seems to be competition between different initiatives that teachers are expected to work with. As a consequence, time is at a premium and working in a research-based manner is

Table 5. Teachers' and principals' views of opportunities and benefits working with research in pre-school and school.

<table>
<thead>
<tr>
<th>What opportunities or benefits do you regard when working with research in pre-school and school?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional approach in my profession</td>
</tr>
<tr>
<td>Professional knowledge</td>
</tr>
<tr>
<td>Practice with theory, evidence</td>
</tr>
<tr>
<td>Raise the status of the teaching profession</td>
</tr>
<tr>
<td>Better cooperation between colleagues/staff</td>
</tr>
<tr>
<td>Increase goal achievement</td>
</tr>
<tr>
<td>Open-ended explanation</td>
</tr>
</tbody>
</table>

Table 6. Teachers' and principals' understanding of challenges and dilemmas working with research in pre-school and school.

<table>
<thead>
<tr>
<th>What challenges and dilemmas do you regard when working with research in pre-school and school?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takes too much time</td>
</tr>
<tr>
<td>Not interesting in my work as teacher/principal</td>
</tr>
<tr>
<td>Interesting and important, but many other initiatives going on</td>
</tr>
<tr>
<td>Interesting and important, but I do not know how to do it</td>
</tr>
<tr>
<td>A challenge to integrate research with systematic quality work</td>
</tr>
<tr>
<td>Open-ended explanation</td>
</tr>
</tbody>
</table>

Teachers found the policy of research-based education both interesting and important, but there seems to be competition between different initiatives that teachers are expected to work with. As a consequence, time is at a premium and working in a research-based manner is
perceived to take too long. Other challenges and dilemmas were related to knowledge and practical procedures regarding how to work with research. The teacher responses emphasized the need for professional development in how to enact the policy. For example: finding relevant research, how to do research in pre-schools and schools, and knowledge exchange between colleagues. Moreover, they expressed a need to find ways to integrate research with SQW.

Some teachers found it hard to define how they enact the policy in their teaching. For example, teachers wrote: “I don’t know what it really means” and “It’s hard to explain how I work with these concepts.” Other teachers felt isolated in their working unit and therefore it was a challenge if their colleagues were not engaged in research. “It is hard when you are the only one in the working team who is passionate about this. It takes too much time and energy to get everybody on board.” The teachers also emphasized the need for support from the principal and the leadership of the municipality in order to be able to enact the policy. Some teachers experienced a lack of support, which negatively affected the enactment of the policy. “My principal is not up-to-date on contemporary research. It takes time to read research and my principal has a very low understanding of how much it demands. To keep up-to-date is not rewarded, which I find remarkable.” Other teachers give suggestions on how support can be given, based on their needs: “Trust and time from my principal”, “Clarity from management that this issue is important” and “Important that the employer encourages me, but also uses my pedagogical competency based on my academic experience.”

The question of time was frequently reflected on, which stressed the need to, within the organization, find opportunities for teachers to implement research findings in their teaching, but also carry out research in their practice. Solutions to the problem of all the competing initiatives teachers are supposed to work with were presented. “Other initiatives that are carried out are based on a scientific foundation and can, therefore, be integrated with a research-based way of working. It is important to make this visible for the teachers.” The teachers felt that if they are given sufficient time to work with research, it will pay off in the long run. “I think it is important to invest time on this issue. Research leads the organization forward. When you put a proper system in place, it shouldn’t take that much time.” Another teacher wrote:

Research is time-consuming and it cannot be rushed if it is to be of high quality. It is important that the teachers who are capable of doing research and are willing to do research, should be given the opportunity to research. The cost that it entails for the employer will likely to be paid back in several ways, both financially and in terms of results.

However, some teachers were satisfied with just keeping themselves updated on research and implementing it in teaching and were not interested in researching themselves. “It is interesting to stay updated and contribute, but I do not want to do that myself. Too many rules and formalities.” Others regard it as important to participate in research studies, but again, are not interested in acting as researching teachers. “I can participate in other people’s research, like in this investigation, but I do not want to research myself as I don’t feel I have the time.” So, there could be different explanations for why the teachers do not want to do research of their own.

Principals. Like the teachers, the principals also found the issue of working in a research-based way in pre-school and school interesting and important, but they felt that there are many competing initiatives that hinder the process. They also perceived it a challenge to integrate research with SQW and called for knowledge on how to enact the policy.

The principals recognized the importance of inspiring their staff to believe that the issue of research is central in schools and that the work based on a scientific foundation and proven experience will lead to school development. “The challenge is to achieve something from this work and to make all teachers view this issue as I do, in order to make a real change in the classrooms.” Both principals and teachers need time to enact the policy. “I need to take the time to think myself, discover things and reflect and learn together with others” and “I have to make time for teachers to reflect.” Solutions to the problem of competing initiatives were also given by the principals.
It is important to have long-term thinking that unites and connects what we already do. I don’t think anybody has the energy to start up something new, but rather we need to develop what we already do and make it even more professional.

To handle the dilemma of lack of knowledge and integrating research in SQW, the principals highlighted the need for support in the form of supervision by people within the organization or in collaboration with external expertise on how to integrate research in pre-schools and schools, finding relevant research for their work and creating models for how to work with SQW, based on a scientific foundation and proven experience. “We need support in the process of finding a model for how to work with research in our practice, what it can look like in school, if we say we integrate research in our organization?” The principals also highlighted conditions and strategies that are important for the policy enactment, for example, sufficient time, other resources (substitute teachers), and forums where principals can meet their staff, but also where the principals can meet other leaders. They also needed support from the management of the municipality and wanted to feel that that the issue was prioritized. “That it is possible to deal with the issue – substitute teachers, project costs – and get support from the management in terms of prioritization.” In addition, they perceived it as important, within their organization, to collaborate with teachers who have a special responsibility for school development, which brings about a distributed leadership.

**Discussion**

**Individual Factors**

On an individual level, teachers and principals are in the process of making sense of the policy. In this case, they are able to use their discretion to interpret the policy and make meaning, an opportunity that the participants in this study embrace, in line with Kroksmark (2014) and Wennergren (2016) who emphasize the need for the profession to define and interpret the meaning of a new policy. The teachers and principals negotiate and construct meanings and interpretations (cf. Weick, 1995), based on their existing experiences and beliefs (Coburn, 2005; Spillane, 2002). Teachers and principals make use of academic knowledge acquired in their previous academic training and teacher and leadership programs when they try to make meaning of the scientific foundation. Thus, they find it somewhat hard to fully define the concept, but the most frequent understanding is that a scientific foundation involves building education on research, both content and methods, and keeping up-to-date on research. Such knowledge is produced by researchers from academia. The third alternative, critical review – source evaluation was less frequent in the closed responses than in the open-ended responses. This indicates an overlap between a scientific foundation and scientific approach. The Swedish Agency for Education sometimes uses the two concepts interchangeably in some of their policy interpretations (Swedish National Agency for Education, 2012a). This could be the reason why teachers and principals link them so strongly. In cases where these two concepts were more clearly separated it is suggested that a scientific foundation means research from academia, showing the state-of-the-art knowledge in different areas, concerning content in a subject, pedagogical content knowledge, pedagogical knowledge, and organizational knowledge. There were differences in how teachers and principals highlighted different kinds of knowledge, depending on their different types of roles and responsibilities. They keep updated on relevant research in order to carry out their assignments in a professional way. It is natural and obvious that the principals look more deeply at research and development regarding organizational issues as they are leading the faculty and are therefore expected to emphasize an organizational perspective in their leadership.

The second concept, proven experience, is even harder to define, but it seems it represents knowledge produced by teachers and principals themselves. They have both similar and contradictory understandings. The definition of the Swedish Agency for Education has had a great impact on the teachers’ and principals’ interpretation that experience should be documented, evaluated, and
spread outside the school context in order to be regarded as proven. However, the Agency definition is also questioned, especially by the teachers in the open-ended answers, which signifies a difference between the two groups, when they regarded extensive teaching experience as proven even if it is not documented in writing and spread outside the school context. The principals showed fidelity to the state definition, which is different from the teachers’ understanding. März and Keltchermans (2013) argue that policy enactment is a complex process, where interaction between policy content, context of enactment, and actors of the enactment impact on each other. This is confirmed in this study – for example, in the process of understanding proven experience, as described above. Negotiating meaning through the use of contextual knowledge can be seen as a way of dealing with the ambiguity and uncertainty that Allen and Penuel (2015) find is central in policy enactment.

Another example of how the teachers and principals deal with ambiguity and uncertainty is their negotiating of meaning of the third concept, scientific approach. Sometimes they found it hard to separate it from a scientific foundation and therefore they instead created an overlap between the two concepts, closely related to each other, but not entirely the same. The idea of implementation of research was a strong theme in both teacher and principal responses, which relates to the idea of research-based education as evidence-based. Such implementation relates to a conventional view, as the teachers and principals position themselves as mere passive implementers of a policy that comes from the top (cf. Honig, 2009; Spillane, 2000). The teacher or principal as a researcher was less frequent, which means that the understanding of research-based education as evidence-informed was rare. At least they were not using those labels to describe their role and work (cf. Levinsson, 2013; Wolfscheid & Opheim, 2016). However, it can be seen that both teachers and principals put great emphasis on the connection between a scientific approach and school development. It implies that they regard themselves as active agents in improving the organization on different levels – the teachers in the classroom and the principals on a more general level, facilitating the teachers through their leadership. This shows an ambiguity in the data. They perceived themselves as active agents in the development of school, but they do not view themselves as researching teachers and principals. It can be interpreted that they in some sense perceived themselves as actors with reference to enactment of a policy, but at the same time, they use a vocabulary from evidence-based practice and conventional understandings of implementation of policy (cf. Ball et al., 2011; Levinsson, 2013; Spillane, 2000).

A scientific approach has a clear connection to school development and Systematic Quality Work (SQW). SQW represents practical tools for working with a scientific approach. The critical review and problematization are supposed to direct ways forward. Here the school development perspective also became visible. The connection to SQW was more frequent in principals’ responses, and this showed a difference between the groups, although it also existed in the teacher responses. This is reasonable, as the national steering documents state that the principals have the main responsibility for the SQW.

Accordingly, teachers’ and principals’ interpretation of how to work with research-based education enabled a contextualized understanding of the policy. This means that the policy and the interpreter impact on each other mutually (Spillane et al., 2002).

Social Factors

Coburn (2005) emphasizes that social factors, such as social interaction within the organization, also impact the policy enactment, which teachers and principals in this study confirm. They give examples of where the social context, for example, discussions between colleagues, has facilitated the understanding and negotiating of meaning of the central concepts, but also supported them

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12All pre-schools and schools are supposed to carry out SQW as stated in the Education Act and the curricula for pre-school and school. The aim of SQW is to elucidate quality and promote equality: what pre-schools and schools do, why, and the results (The Swedish National Agency for Education, 2010a, 2010b, 2010c, 2012b).
in how to apply research in teaching and the organization on a general level. Therefore, the benefit of creating professional learning communities (Stoll et al., 2006), was central in the policy enactment. However, there were also examples of lack of social support that hampered the policy enactment. Teachers sometimes felt isolated in their working teams when working with research. If teachers do not have a collegial context, there is a possibility that the enactment will be hindered. Principals also called for additional social interaction, between themselves and the teachers, but also between principal colleagues. Accordingly, it was important to create forums for this kind of interaction for both groups.

Social factors entail, besides social interaction, professional development too, affecting teachers’ and principals’ learning and enactment of a new policy (Coburn, 2001; Spillane, 1999). One important professional development initiative that teachers of this municipality are participating in, is the master’s program which aims at promoting teachers’ scientific competencies. Through this program the teachers can have access to relevant research and learn how to research themselves. This program has affected the policy enactment in a positive way.

The teachers and principals also seek professional development on how to integrate research in their SQW. They can see there is a connection there, but it is important to find models for this work.

**Structural Factors**

Structural factors affecting policy enactment relate to what kind of support is given, degree of participation in decision-making, how the organization changes during the policy enactment, and principals’ roles in creating conditions for the teachers to enact the policy (Brezicha, Bergmark, & Mitra, 2015; Coburn, 2005; Márz & Keltchemans, 2013; Spillane et al., 2002). The structural factors that impacted most negatively on the policy enactment were lack of time and financial resources when having to deal with the many and sometimes competing contemporary policies – which was something both teachers and principals recognized and struggled with. However, the issue of time and other conditions were of more concern to the teachers than the principals. The fact that teachers had higher expectations than principals in areas such as influence on and confidence in the work, cooperation with colleagues and the courage to try new things, can be viewed as somewhat disheartening. If the principals have lower expectations than teachers regarding the opportunities and benefits of working with research, it can negatively affect principals’ support to teachers. The teachers are supposed to enact the policy in their teaching and are therefore in great need of the necessary conditions to do so, while the principals are responsible for facilitating the teachers in their work, and as such it is vital that the leaders ensure the teachers have the time they need and that they also come up with other helpful strategies. This highlights the important role of principals in facilitating an enactment process through the creation of sound conditions (Coburn, 2005). Such conditions can involve making room for research in teachers’ working hours and connecting research to the different ongoing initiatives. It is important to put these facilitating structures in place to support the teachers in their enactment of the policy. The principals, together with the management of the municipality, were responsible for creating conditions to make policy enactment more effective. The teachers and principals felt that when the conditions of adequate time and financial resources were met they could see advantages connected to the policy, relating to both professional development and school development. In addition, the structural support from a district level, in this case, the municipality management, included strategies to support the teachers’ and principals’ work with the enactment of the policy. The municipality had introduced support strategies such as a research and school development strategy; a scientific leader position; a scientific education board; a master’s program in education in collaboration with a university; and an in-house researcher. All these strategies aimed to create opportunities for scientific activities and professional development.
Final words

The study has explored teachers’ and principals’ diverse experiences of enacting the policy of building education on a scientific foundation and proven experience. The major similarities between teachers’ and principals’ experiences show that (i) it is hard to fully define and interpret the central concepts of the policy, especially “proven experience”, (ii) great emphasis is put on the connection between a scientific approach and school development and their SQW, (iii) it is important to create forums for teachers and principals to meet and discuss the policy and its enactment, (iv) it is vital to create professional development initiatives to support the integration of research in schools, especially in the SQW, and (v) it is necessary to create conditions, such as time and resources, that enable the policy to be enacted.

The major differences between the groups center around the following aspects: (i) teachers and principals highlighted different types of knowledge when discussing the scientific foundation, depending on role and responsibility (teachers draw on scientific knowledge focused on teaching, while principals relate to organizational literature to a higher degree), (ii) teachers were more critical of the state-defined concept of “proven experience” than principals, who showed more fidelity to the state definition, (iii) the SQW was more evident in the principal responses than in the teacher responses, and (iv) teachers had greater expectations of opportunities and benefits of working with research in schools.

Based on the teachers’ and principals’ experiences and needs expressed in this study, they are in a process of interpreting, negotiating and enacting the policy, which is an ongoing task without completion (cf. Ball, 2012). So far, they have experienced both challenges and opportunities when enacting the policy, and it has proved to be a rewarding if complex process.

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References


**Appendix**

**Questionnaire to teachers and principals**

1. **How do you interpret the concept "scientific ground"?**
   - To build the education on science, both content and methods
   - Staying updated on research
   - Critical review, source evaluation
   - Open-ended explanation

2. **How do you interpret the concept "proven experience"?**
   - The collected experience I have as a teacher/principal
   - The collective experience me and my colleagues have
   - Systematically documented and evaluated experience, used during an extensive time span and spread outside the own school
   - Open-ended explanation

3. **How do you interpret the concept "scientific approach"?**
   - To implement research results in school practice.
   - Systematic reflection, critical review, and evaluation of teachers’/principals’ work
• To use scientific theory and method in order to understand and develop practice
• Important part in Systematic Quality Work (in Swedish SKA)
• Open-ended explanation

4. Give examples of how you apply a scientific foundation, proven experience and scientific approach in your work in preschool or school (open-ended explanation)

5. What opportunities or benefits do you regard when working with research in pre-school and school?
• Professional approach in my profession
• Put words to my tacit professional knowledge
• Combine practice with theory - evidence
• Influence over and confidence in my profession
• Courage to try new things
• Raise the status of the teaching profession
• Better cooperation between colleagues/staff
• Improve the education for children and students
• Increase goal achievement
• Open-ended explanation

6. What challenges and dilemmas do you regard when working with research in pre-school and school?
• Takes too much time
• Not interesting in my work as teacher/principal
• Interesting and important, but many other initiatives are going on
• Interesting and important, but I do not know how to do it
• A challenge to integrate research with Systematic Quality Work
• Open-ended explanation

7. Any additional thoughts that relates to research and development in preschool and school that you wish to share? (open-ended explanation)