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What enables or hinders
the use of research-based knowledge
in primary and lower secondary school
– a systematic review and state of the field analysis

DANISH SCHOOL OF EDUCATION
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by
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Foreword

This is the full report on the systematic review of the international empirical research on what enables or hinders the use of research-based knowledge in primary and lower secondary school.

The project was commissioned by the Danish Ministry of Education. Work on the project was carried out in the period 1 January 2016–28 March 2017.

Clearinghouse would like to thank Professor Terje Ogden, Professor Robert E. Slavin, and Professor Jonathan Sharples for their participation in the review group. The review group not only accepted our invitation to participate in the project, they actively took up the challenge as reviewers of the relevant international research and the overall project.

Clearinghouse also wishes to thank key persons in thirteen countries who participated in interviews for the state-of-the-field project.

Finally, Clearinghouse wishes to thank the Danish Ministry of Education for the commissioned research.

The report was completed in June 2017.

Camilla Brørup Dyssegaard

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Executive summary

Introduction

Over the past ten years interest has steadily grown in the field of education in the question of how the use of research-based evidence can influence decision-making at both policy and practice level. The present project set out to examine what enables or promotes the use of evidence-based knowledge in primary and lower secondary education. The term implementation is the key concept in the international research literature regarding the use of research-based knowledge in practice. It covers a specified set of activities designed to be put into practice, either of a conceptual/theoretical character or related to specific programmes or activities.

Methods

Three approaches are applied in the research project:

1. An overall conceptual and theoretical framework was established to promote insight into the specific research field of the implementation of evidence-based knowledge in the educational area.

2. A systematic review was undertaken of the use of evidence-based research in primary and lower secondary schools. The purpose was to identify what enables or hinders the use of research-based knowledge in primary and lower secondary school. (State of the evidence.)

3. An analysis was undertaken of how ten selected countries or regions have approached, at both strategy and policy level, the implementation of evidence-based knowledge transfer into primary and lower secondary education. The analysis also focused on the roles played in this process by institutions responsible for teacher training and in-service training in primary and lower secondary education. (State of the field.)

Concepts and theories

Implementation research began to develop as a discipline in the 1980s, focusing on the importance of the quality of implementation processes. It had its roots in the study of the adoption of innovations in a real-world context, a research field that has been studied for well over forty years. Overall studies have shown that implementation science is a multidisciplinary field, investigating how research findings are transferred, implemented, and sustained by targeted audiences. Four components in knowledge transfer have been identified: problem identification, knowledge development and selection, analysis of context-knowledge transfer activities, and knowledge utilisation. There are three typical knowledge-transfer processes: linear, cyclical, and dynamic multidirectional processes. In educational settings, knowledge transfer is a dynamic multidirectional process, which emphasises the personal nature of

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the implementation process and focuses on the connection and exchange between the users and producers of research.

The last decade has seen a growing focus on factors that influence implementation processes, and frameworks for quality implementation have been developed. One of the best-known frameworks includes the critical steps of initial assessment strategies, decisions about adaptation, capacity building, structural features for implementation, ongoing support strategies, and improving future applications. A later framework – widely disseminated, used, and discussed in the Nordic countries – includes implementation drivers related to development of competencies, organisation development, and leadership. Last but not least, an implementation handbook published in 2016 identified important dimensions and factors including the following five: preplanning and foundation, intervention characteristics, support systems, fidelity, and adaptation. All these headings represent critical steps in the study of implementation that require attention and analysis.

Results, state of the evidence

The systematic review points to six factors that can enable or hinder the successful use of research-based knowledge in schools. These are **management and leadership, professional development, support systems, fidelity, attitudes and perceptions, and sustainability**.

The studies and results under the theme **management and leadership** clearly demonstrate the important role of school principals and school management teams in the implementation of programmes and activities. The two preconditions of instructional leadership and available human and material resources, including administrative support, are clearly vital. Sustained support for the implementation by the principal is also important. In most cases where new programmes or activities are introduced, there is a need to re-culture the organisation. Here school principals must lead the way with high expectations and caring relationships so as to being all on board.

The use of data to assess progress is also an important management tool. School principals or school management teams must demonstrate commitment and sustained support, not only in the start phases, which are critical for teacher take-up of programmes or activities, but also by close follow-up through the remainder of the implementation process. School principals or school management teams need to show flexibility and give personal support at times when changes in the process may be required. Results also indicate that school leaders and school management teams need to be thoroughly familiar with the processes and procedures that form part of the programmes or activities if they are to support their

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teachers. Knowledge of curriculum, instruction, and assessment processes is also necessary in order for school principals or school management teams to help their staff in their daily practice, and administrative support for the teachers must be secured. Trust and shared leadership – in management teams and in the relations between school principals or school management teams and support-team members – promote the implementation processes.

Absence of the above-mentioned characteristics among school management and leadership leads to lower fidelity in the implementation stages, and may even be the direct cause of implementation failing. Unrealistic expectations can also result in insecurity among staff, leading to a lower uptake. Finally, high levels of school principal turnover lead to low fidelity.

The results from the nine studies in the theme of **professional development** comprise, in summary, a number of mutually reinforcing findings.

The majority of the studies included in this theme conclude that intensive and targeted professional development is a key facilitator for thorough preparation and implementation. "Intensive" means that ample time must be allocated, and "targeted" means that the professional development is aimed precisely at the programmes or activities. Another important point found in several of the studies included under this theme is the importance of sustained professional development, preferably spread over time and in a form including feedback with a focus on teacher practice in the classroom.

Guidance and support in classroom implementation are important when managing fundamental change in instructional practice. Direct independent observation of the teachers implementing or observing each other seems to promote the implementation process. Professional development plays an important role in creating a positive attitude towards the intervention both among teachers and in whole-school staff awareness, and training is an important means to achieve a common set of goals and shared values. Professional development practices that encourage collaboration through teams are crucial because they create opportunities to share experiences.

It also seems that evidence-based practices in which teachers are given teaching resources and demonstration of how to use them can promote implementation. Results from two studies point to the fact that the use of video can be effective. One study shows that video is more easily usable than written materials and can lead to a higher rate of fidelity. In the other study, teachers report that the use of video during collaborative seminars where the participants can see a teacher using the programme or activity in practice can promote the implementation process.

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Collaborative practices that enhance the interaction between universities, schools and school districts seem also to promote the implementation process when assisting school administrations and school districts in choosing adequate interventions and in teaching teachers how to use different data sources to assess and enhance student learning, for example. Last but not least, personal development should be tailored to meet local context and local policies.

Overall, the studies show the importance of having systems that support schools in the implementation of the programmes or activities. **Support systems** can take the form of external or internal consultants, consultant groups, or coaches. They also have an important role regarding fidelity. It is observable across the studies surveyed that support systems are essential when preparing for and undertaking the implementation process of a programme or activity. However, the processes are not linear: often the collaboration between teachers and support staff goes back to earlier stages so that gained experiences can be integrated in the programmes or activities. Finally, it is stressed that the support systems should be accessible and ongoing during the whole implementation process and also after implementation in order to support enduring effects.

Instructional consultation teams using a problem-solving approach and working in partnership with university researchers seems to be effective. The positive results are related to extensive and ongoing training and support. Furthermore, a direct connection was seen between teachers" utilisation of the support system and facilitator stability. Facilitators must be active, effective, and skilled in the programme or activity, and they must not only be able to cooperate with the school principal but also have the confidence of the staff. There must be release time for collaboration, and electronic resources and communication platforms must be provided. Comprehensive data systems that support and monitor implementation are also important. Support from universities in relation to training, coordination, and evaluation is also seen to have positive effects on the implementation processes.

Training and the use of coaches seem to have an essential role in regard to implementation. Again here, the principal is seen to have a vital role. The effectiveness and the use of coaches appears to increase when the principal's support for the use of coaches is apparent. A further advantage of using coaches is that teachers need less theoretical training in the implementation, because they learn this in peer-to-peer training in actual practice. Behavioural coaches working with teachers in class for a period of time have an effect, but there must also be access to the coach for continuing support after specific programmes or activities have been implemented in order for the effects to endure. Coaching can be set

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up in two phases: a universal phase covering general issues, and a tailored coaching phase addressing teacher-specific needs. Assessment by coaches of teacher implementation early in the process is predictive of future implementation quality. Regarding the motivation for using coaches, it appears that schools with greater need are more positive in their reception of training and supervision. Sufficient resources need to be allocated to ensure that coaches and facilitators are accessible during implementation processes.

Intervention groups where students are taken out of class and led by psychologists or teachers with special competences are effective, but the use of teachers seems to be more cost-effective and also more sustainable because they remain at the school and have better knowledge of the students.

Mental health support to schools from teachers or other internal or external staff is effective, but lack of a common language between the school system and the health system can cause communication problems and misunderstandings.

All the studies included under the theme **fidelity** point to the fact that implementer fidelity is crucial for attaining the full effect of programmes or activities. This is not an easy goal, however. Teachers often stick to what they know instead of following new instructions, or they may find it difficult to see the relevance of the programme or activity in their classrooms. They can also have too little or only superficial knowledge of the programme or activity. Differences in implementation may also be the result of individual differences between teachers and/or contextual variables rather than related to the programme or activity.

Studies show that programme guidelines are not always followed, and that adherence to guidelines differs between teachers. The use of implementation fidelity checklists or implementation adherence checklists seems to promote a high rate of fidelity. Another way of maintaining a high fidelity rate is by using video observations and group feedback sessions under the implementation process.

Lack of fidelity can occur when large-scale school reforms are implemented without making teachers aware of all that is required for the implementation, or without providing tangible guidelines for establishing a new teaching practice. It is also crucial that staff and school setting are taken into consideration when choosing specific programmes or activities for implementation. If the programme or activity is chosen solely because it is a known or popular strategy it is less likely to achieve a high fidelity in implementation.

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Low fidelity can also be caused by teachers feeling that they lack support and time when implementation meetings are cancelled because of other meetings, test-taking, or field trips. Implementation must also take the yearly cycle of school activities in account to avoid interference and low fidelity. High rates of teacher turnover also have a negative influence.

Implementation elements that differ markedly from daily practice have the highest risk of low fidelity leading to the absence of lasting effects. To ensure a high degree of fidelity, support for teachers and collaboration practices are important, and they may be continued after the end of the implementation period.

Implementation fidelity seems easier to attain and maintain in relatively small schools, which could be explained by the small number of staff. It also seems easier to attain with less experienced teachers, who may find it helpful to have guidelines to follow in their daily practice.

All seven studies under the theme **attitudes and perceptions** showed that teacher attitudes to and beliefs about a programme or activity are vital for successful implementation. For the implementation process to be successful, management needs to show commitment and also apply resources. There must be enough time, enough planning, and a generally reasonable workload for the teachers. It is also important to stick with the principles of a project in spite of problems encountered along the way.

Teachers' beliefs in the positive effect of a specific programme or activity seem to promote the implementation process, and this is further strengthened when the school has an evaluation plan in place. By contrast, another study describes three impediments to implementation: uncertainty about the goal of the programme or activity, lack of ability or willingness among teachers, and problems with showing measurable gains.

Taking a differentiated approach with specific teachers regarding how to use the programme or activity can also improve the implementation process. Regarding fidelity to implementation processes, it seems that teachers with less experience stick more closely to the principles for implementing new programmes or activities. Establishing shared goals also seems to contribute to collaboration between teachers at different grade levels. Active involvement of staff in the choice of programme or activity, combined with awareness training about the programme or activity, can contribute to a more positive attitude to uptake and implementation. Small schools and those with high percentages of children from low-income families seem to promote a more positive motivation for new programmes or activities. Ongoing union job

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action and lack of possibilities for compensating teachers for training time can negatively influence attitudes and perception.

Programmes where policy language and implementation procedures are ambiguous and open to varying interpretations can lead to anxiety and to feelings of being overwhelmed and confused. Difficulties in establishing and agreeing on a shared strategy and understanding can also have damaging effects on teacher uptake of implementation.

The studies presented under the theme **sustainability** show results that complement those indicated under the five themes already outlined above. Leadership, adequate training and professional development for teachers, and establishing a common language are all important for sustainability.

Studies also show that there are life cycles for projects. Sustainability depends on ongoing planning for renewing implementation. Sustainability is not merely a next step; it requires communication, evaluation, and re-commitment processes. Good teacher–student relations have positive influence on sustainability.

Challenges to sustainability come partly from environmental and contextual factors. Changes in the district policy environment – to educational goals, objectives, and obligations – can result in time not being allocated for programmes or activities to settle. Curtailed funding can also result in programmes or activities not being sustained after implementation.

Results, state of the field
The study of the **state of the field** shows that policies and strategies for the use of research findings in schools are highly related to local school traditions. These policies and strategies vary from centrally controlled knowledge transfer to decentralised models in which bottom-up approaches are important.

Professional development is also strongly related to traditions. Almost all countries have several routes to becoming a teacher, followed by a centrally established certification process. About half of countries require probationary periods for newly trained teachers, and there are legal requirements for continuing professional development. A few countries, among them Denmark, have very lax requirements.

Initiatives that support knowledge transfer and knowledge mobilisation can be strongly centralised or very decentralised. However, most countries rely on a suite of different

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support systems, ranging from foundation institutes or organisations and centrally placed learning consultants to website-based information bases, discussion forums for teachers to share experiences, collaboration between schools and universities, and finally the use of collaborative inquiry models in which teachers work together to identify common challenges, analyse relevant data, and test out instructional approaches.

Experiences with knowledge transfer and knowledge mobilisation show that acceptance and compliance are visible in some country contexts while resistance to change (which limits sustainability) is visible in others. Again, these differences stem from local traditions along a spectrum from relatively fixed curriculum-controlled instruction to high degrees of autonomy.

The most effective approach for implementation of research findings in schools seem to be related to central control combined with initiatives that at the same time support bottom-up activities facilitated by listening to teachers' needs and wishes and use of collaborative inquiry. Requirements for certification, probationary periods, and mandatory continuing professional development are important elements in effective knowledge transfer. Support systems that ensure that knowledge from research reaches the teachers in their classrooms are also important.

Conclusion
Finally it is interesting that theory, the systematic review, and the experiences from the ten countries show that all six thematic areas – **management and leadership, professional development, support systems, fidelity, attitudes and perceptions**, and finally **sustainability** – are of vital importance in the implementation processes of research-based knowledge, whether this be in the form of specific interventions or a more conceptual form such as collaboration between schools.

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1 Introduction

This systematic review was commissioned by the Danish Ministry of Education and was conducted by the Danish Clearinghouse for Educational Research. Its aim is to gain insight into what enables or hinders the use of research-based knowledge in primary and lower secondary school. Integrated with this objective will be the identification of research with sufficient weight of evidence.

1.1 Background
Interest has been growing over the last ten years in how to make educational research easier to access and to use both for education policy and in education practice. Therefore it appears that there is a need to gather knowledge on the implementation process itself – that process through which evidence-based knowledge brings about specific changes among practitioners.

The literature on implementation and knowledge transfer across research areas is extensive and in many cases well established, especially in the field of health and social research (see e.g. Fixen et al., 2005; Durlak & DuPre, 2008), but also increasingly in education and criminal justice (see e.g. Nutley et al., 2007).

Practice has shown that the trajectory from research results to practice is a difficult one to traverse. Within the medical field, it takes on average 17 years for 14 per cent of scientific advances to become part of day-to-day practice (Belas & Boren, 2000). The need for more organised approaches to implementation practice, science, and policy is clear (Ogden & Fixsen, 2014). As stated by Goldman et al. (2001): "There is uncomfortable irony in moving forward to implement evidence-based practices in the absence of an evidence base to guide implementation practice" (p. 1593).

1.2 The educational field
Within educational research, knowledge on implementation, use and knowledge transfer is primarily either conceptual and theoretical in character or related to evaluations of specific programmes or activities. It seems to be difficult to identify what specifically promotes and/ or hinders the use of research-based knowledge and knowledge dissemination processes (see e.g. Maughan et al., 2012).

An EC (2007) document states that the challenges affecting the creation of knowledge in education centre on the areas of relevance, quality, and low funding levels. The body of research is also very broad: very different methodologies may be used, and results on the same research issues may differ. The differences in outcomes show not only the breadth of the field of educational research, but also the complexity of the research topics. These

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challenges appear to be more pressing in the educational research field or the educational policy field than, for example, in those of social care and employment policy.

A study of thirteen university faculties in Canada, the United States, Australia, the United Kingdom and Singapore (Levin et al., 2013) has shown that knowledge mobilisation is under-institutionalised and conducted in an ad hoc fashion. Academic leaders acknowledge the need for knowledge mobilisation, but identify several barriers in the area. These include money constraints, differing attitudes and research approaches, time, the difficulty of formulating measurable targets and outcomes, difficulties in communicating research to a wider public, too many information sources, difficulty in mobilisation at institutional level, the criteria for teacher tenure/promotion, a short supply of history of knowledge transfer in social sciences, and a lack of sustained leadership committed to knowledge mobilisation.

Tseng & Nutley (2014) raise the question of who the research should be relevant for. The field of education and education research comprises numerous different stakeholders: teachers, administrators, librarians, other practitioners, parents, policymakers, voluntary organisations, professional associations, the media, the general public, and finally the researchers themselves. They conclude that there is a need for a clear focus on key research users and on the functions that research serves for their work. Although stakeholders share mutual commitments to developing education systems, their knowledge needs may be very different.

Sharples (2013) describes a chain of activities that are required when establishing effective use of evidence in social practice. He presents a "knowledge mobilisation ecosystem" consisting of the following four components: evidence producers, evidence synthesisers, evidence distributors/transformers, and evidence implementers. "If we break down the overall process of knowledge mobilisation, we see that it is a relatively complex chain of activities, requiring distinct processes of research production, synthesis, distribution, transformation and implementation all working together" (ibid. p. 8). If the ecosystems are to be effective in social practice, he emphasises, it is essential for all elements to be considered as a whole.

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Figure 1. **Elements of an evidence ecosystem** (adapted from Shepherd, 2007a)
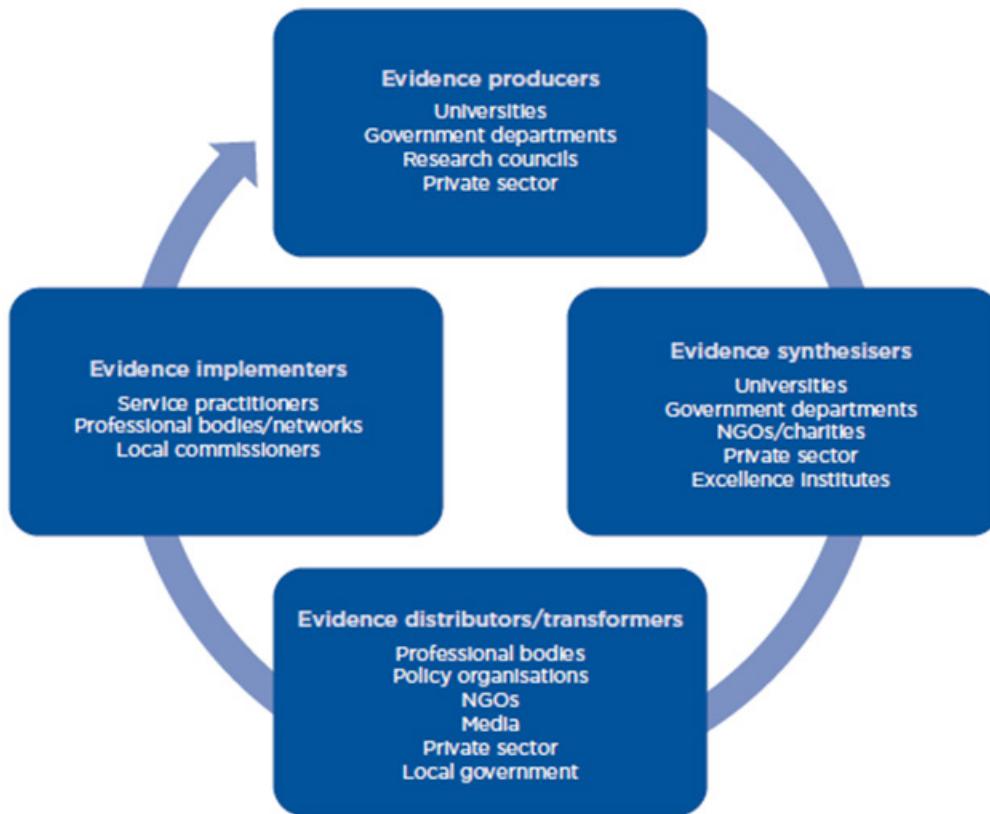
(Sharples, 2013, p. 9)

This is the argument that constitutes the basis on which the present systematic review has been undertaken. The systematic review contributes new knowledge on:

- National and international empirical research on the use of research-based knowledge, and on the factors that enable the use of research-based knowledge and knowledge mobilisation from educational research in primary and lower secondary school
- Identification of the need for further research within the field.

1.3 Aims of the systematic review
The aim of this systematic review is therefore to produce a rich and detailed account of the existing quantitative and qualitative empirical research on what enables the effective

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use of externally produced evidence in schools. The purpose is also to identify initiatives, strategies, methods, programmes, and activities that enable or hinder the implementation of research-based knowledge in primary and lower secondary school.

The review question posed in the systematic review is:

- What enables and/or hinders the use of research-based knowledge and knowledge implementation in primary and lower secondary school?

Broad and narrow searches have been conducted in eight databases to identify as many studies as possible which fit the criteria for the review (see Appendix 8). A large proportion of the included studies are on implementation of specific interventions (clearly defined instrumental programs or activities) simply due to the fact that these studies are of a more robust nature.

Also included in the attempt to answer this question will be a mapping of research in the field, a mapping that in turn will aim to answer the following two questions:

- What are the strategies and policies that have been developed by the ten countries, states and regions surveyed to work with knowledge transfer and knowledge mobilisation in the use of research-based knowledge to develop practice in primary and lower secondary education?
- What are the roles of the institutions that are responsible for initial teacher training and teacher in-service training in primary and lower secondary education in relation to knowledge transfer and knowledge mobilisation from research to practice?

1.4 Definitions
This systematic review uses four key concepts related to the study:

- Knowledge mobilisation
- Knowledge transfer
- Knowledge implementation
- Knowledge dissemination

Knowledge mobilisation is defined by Sharples (2013) as the chain of professionals/activities required to establish an effective use of knowledge in a context in which institutions and leaderships play important roles in an "ecosystem" consisting of four components: evidence

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producers, evidence synthesisers, evidence distributors/transformers, and evidence implementers.

Knowledge transfer is defined by Ward et al. (2009) as a process comprising five components proceeding from problem identification to knowledge utilisation in a context in which there are multidirectional interactions between producers and users of knowledge and attitudes and relations have high influence.

Knowledge implementation is used as defined by Fixsen et al. (2005):

> .... a specified set of activities designed to put into practice an activity or programme of known dimensions. According to this definition, implementation processes are purposeful and are described in sufficient detail such that the independent observers can detect the presence and strength of the "specific set of activities" related to implementation. In addition, the activity or programme being implemented is described in sufficient detail so that independent observers can detect its presence and strength (p. 5).

However, it is important to stress, as Fixsen et al. state, that implementation covers both the conceptual use of research knowledge such as constructivist approaches to teaching, for example, and a more instrumental use of research knowledge in the form of specific programmes such as PALS or Reading Recovery. The term "implementation" is the key concept within the international research literature regarding the use of research-based knowledge in practice.

The fourth concept, *knowledge dissemination*, was used especially in the 1960s and 1970s and advocated by the United States' 1977 federally constituted Dissemination Analysis Group, which identified four functions or types of dissemination: spread, choice, exchange, and implementation (Klein & Gwaltney, 1991).

1.5 Time span, geographical, and language delimitations

Time span limitation

The scope is delimited in time to studies published between 1 January 2011 and 1 March 2016.

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The geographical and language delimitations of this review

The systematic review is delimited so as to include studies from the EU, Switzerland, Norway, the United States, Canada, Australia, and New Zealand.

The language universe of the review

Studies published in English and in Scandinavian languages (Danish, Swedish and Norwegian) are included. This is based on the pragmatic consideration that competence in dealing with these languages is available in the review process.

1.6 Project organisation
The review was carried out by staff members of the Danish Clearinghouse for Educational Research, in cooperation with a review group. The staff members include:

- Associate Professor Camilla Brørup Dyssegaard, Head
- Professor Niels Egelund

Research assistants:
- Anja Bondebjerg
- Anna Jessen
- Hanna Bjørnøy Sommersel
- Stinna Vestergaard

Three leading researchers in the field also participated as members of the review group:

- Terje Ogden, research director at the Norwegian Centre for Child Behavioural Development and professor at the Institute of Psychology, University of Oslo, Norway
- Robert E. Slavin, director, Center for Research and Reform in Education, Johns Hopkins University, professor, Institute for Effective Education, University of York (England), and chairman, Success For All Foundation
- Jonathan Sharples, senior researcher and professor in the Education Endowment Foundation (EEF), UK

The review group carried out quality assessment of the relevant research in collaboration with the Danish Clearinghouse for Educational Research. The review group members also reviewed the overall process from scoping, searching, screening, and data extraction to the

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research mapping. Finally, the review group reviewed the final report.

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2 Implementation: concepts and theories

This chapter will outline some of the key concepts and theories related to implementation, in order to shed further light on the field of study. First there will be a look at how implementation has been the subject of scientific inquiry. Next there will a focus on how implementation has been studied in field of educational research. Finally, implementation in practice will be covered, including which factors enable or hinder the use of evidence-based knowledge in schools.

2.1 Implementation science

Implementation science is a multidisciplinary field covering a broad span of areas that can include agriculture, manufacturing, business, health care, social services, juvenile justice, and education. The subject matter of implementation science is how research findings are disseminated, implemented, and sustained by targeted audiences. It thus seeks to close the gap between knowing and doing by finding evidence about how to effectively implement evidence-based programmes, practices, or policies in community settings.

Empirical research in implementation began in the 1980s (Bash et al., 1985, Tobler, 1986). It pointed to the importance of the quality of the implementation process. As the research field developed, the complexity of implementation processes became more apparent. The researchers began to describe several factors of implementation. Dane & Schneider (1998) mention five: fidelity, dosage, quality, participant responsiveness, and programme differentiation.

Durlak & DuPre (2008) add three more factors: monitoring of control/comparison conditions, programme reach (participation rates, programme scope), and adaptation (programme modification, reinvention). Kitson et al. (1998) have given the simplest summary of successful implementation. It requires that evidence is high, that the context is receptive to change, and that there is support by appropriate facilitation.

Implementation science frequently involves adopting innovations in a real-world context, a field that has been studied for well over forty years. Rogers (2003) developed the theory of "diffusion of innovations," which is used as a framework by researchers within a wide variety of disciplines including political science, public health, economics, and education. Rogers (ibid.) defines diffusion as "... the process through which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system" (Rogers, 2002, p. 990). He defines innovations as follows: "An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption" (Rogers, 2003, p. 12). Rogers (ibid.) understands implementation as one of five stages in the diffusion of innovations. The first stage is dissemination of information to potential interested parties.

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The second is adoption by a local unit or organisation. The third is implementation of the innovation, while the fourth is evaluation assessing the innovation in continuing practice. The fifth stage is institutionalisation, in which the innovation has become an integral part of daily practice.

2.2 Implementation in education

A number of factors influence the implementation of evidence-based knowledge in education. In their rapid evidence review, "Using Evidence in the Classroom: What Works and Why," Nelson & O'Beirne (2014) find that while the production of research is fairly abundant and evidence syntheses are commonplace, organisations that coordinate the collation and transform it into usable formats for the teaching profession are in short supply. They also mention that knowledge mobilisation is unlikely to take place in the absence of some form of support system and a focus on cultural change. In many countries the educational system is autonomous and decentralised, so that central and local governments will often stand aloof from or lack the capacity to take responsibility for coordination. Nelson & O'Beirne also point to the transformative process by which research comes to be used in guidelines for implementations that need to incorporate management considerations, costs, and training requirements.

Examples of implementations that have failed to produce the expected results from relatively complex national reforms can be found in the Nordic countries. One of them is a study from Finland, included in the present systematic review (Korkeamaki & Dreher, 2010). Another is the Knowledge Reform implemented in Norway between 2006 and 2012. Several evaluations written in Norwegian conclude that this reform failed in most respects, probably because the government refrained from taking responsibility for local implementation: the findings are summarised by Nordenbo (2012). A study from the United Kingdom by Humphrey et al. (2013), which complements Wolpert et al. (2013) in the present systematic review, also points to the challenges facing national strategy reforms in relation to fidelity and attitudes.

The review by Nelson & O'Beirne (2014) also identifies factors and approaches that enable the use of evidence in schools. First and foremost, teachers and principals need to have a belief in the value of pursuing an evidence-informed practice, and their need should be embedded in their own profession, not in the research community. Secondly, the role of evidence should have a high priority both in initial teacher training and in continuing professional development and training for school principals.

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2.3 Implementation strategies

Top-down versus bottom-up approaches to improving research are discussed by Tseng & Nutley (2014). They find that the approach chosen seems to be related to whether knowledge mobilisation is viewed as primarily about dissemination and implementation, or about co-production of knowledge at local level. The top-down linear model disseminates new programmes or activities from a central source to the local level, for example the implementation of new school reforms. A side effect of the use of the top-down model mentioned by Ogden & Fixsen (2014) is that the local context is not taken into consideration, and in this situation teachers can perceive the programmes or activities as a threat to their autonomy. This approach is characteristic in the United States, where decisions made at the federal level affect the demand for particular types of educational research and the ways in which it is to be done (Tseng & Nutley, 2014).

In the bottom-up approach, programmes or activities are initiated at the local level, for example by municipalities or teachers. A side effect of this approach could be a better uptake of the programme or activity, accompanied by a risk that the programme or activity may not be implemented correctly (Ogden & Fixsen, 2014). The bottom-up approach is commonly used in Canada, where there have been no significant federal initiatives for education. Instead, the Canadian provinces have been the primary source of educational facilitation and initiatives (Tseng & Nutley, 2014).

Ogden & Fixsen (2014) point out that researchers clearly would like to combine top-down and bottom-up approaches in such a way that the "knowledge to action" process could have two sides: an "evidence-based practice" and a "practice-based evidence." "Successful implementation seems to depend on striking a good balance between the two with top-down leadership and system support for bottom-up-practice and organisation change" (ibid. p. 6).

Tseng & Nutley (2014) conclude that research is not the silver bullet for education reform, but that it can help in understanding problems and identifying potential solutions. It is important that research results are integrated with different types of evidence and are subsequently adjudicated alongside values, interests, and local circumstances.

Goldacre (2013) summarises findings from eight publications on challenges to be faced in teachers' use of external evidence under the heading "Values, beliefs, and priorities." He describes four main challenges. First, the use of external evidence is in conflict with teacher autonomy; second, there is a lack of receptivity to research findings that are in conflict with own professional judgement; third, the use of evidence is perceived as being of low rele-

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vance; and fourth, there is a lack of confidence in research and its currency. On top of this, he mentions three practical challenges highlighted in four publications: information overload; a lack of time and capacity; and a lack of skill in interpreting or acting upon research findings.

Nelson & O'Beirne (2014) end their review by pointing to actions that are required for the development of a culture of evidence use within the teaching profession. First, governments should support the use of evidence by providing seed funding for an infrastructure for knowledge mobilisation. Second, teacher representation bodies should nurture the impetus for an evidence-informed teaching profession. Third, schools, collaborative networks, training providers, and professional associations should promote teachers engaging with research. Fourth, research organisations and intermediary bodies should transform evidence for practice. Fifth and finally, funding organisations should commission evaluations of different approaches to knowledge mobilisation.

2.4 Implementation frameworks
Numerous models have been set up for implementation practice, and it is impossible to set up a gold standard. The following section will present some of the main models presented in the literature.

The literature review by Fixsen et al. (2005) stresses that the activity or programme should be described in sufficient detail for independent observers to be able to detect its presence and its strengths.

Fixsen et al. (2005) also describe how the independent observer needs to differentiate between implementation outcomes and effectiveness outcomes. Implementation outcomes differ from effectiveness outcomes both empirically and conceptually. Finding implementation outcomes requires looking for and identifying the processes that lead to successful and sustainable implementation of evidence-based programmes or activities (Ogden & Fixsen 2014). The observer must therefore be aware of activities at the two levels –programme/activity level and implementation level. Only when programmes are fully implemented can positive outcomes be expected. Proctor et al. (2009) cites the Institute of Medicine implementation model, where seven example outcomes are mentioned: feasibility, fidelity, penetration, acceptability, sustainability, uptake, and costs.

Fixsen et al. (2005) also differentiate between three degrees of implementation: paper implementation, process implementation, and performance implementation.

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The term "paper implementation" covers cases where new policies and procedures are put into force but are to a greater or lesser extent neglected by management and staff. An example of paper implementation in universities is in the accreditation of studies, where outside groups monitor for compliance but the monitoring is focused on the paper trail rather than on actual practice.

Process implementation involves putting new operating procedures in place, conducting training workshops, and using supervision and evaluation schemes guided by a specific programme or activity as the background for the procedures, in a situation where the activities that are unfolding will not necessarily result in a change of practice. An example of this could be teacher training that is merely theoretical and not related to practice.

Performance implementation means putting aims, guidelines, training programmes, procedures, and processes in place that actually result in a direct change of practice. This form of implementation is the focus of the present systematic review.

In relation to his diffusion model, Rogers (2002) defines innovativeness as the degree to which individuals or units of a social system adopt new ideas. He describes five categories of adopters based on their degree of innovativeness: innovators, early adapters, early majority, late majority, and laggards. He finds that innovators comprise the first 2.5 per cent of individuals in the system and that early adapters are the next 13.5 per cent. Early majority and late majority comprise 34 per cent each, with laggards making up 16 per cent.

There are many factors that influence implementation processes. On the basis of their research synthesis, Fixsen et al. (2005) found that successful implementation requires a long-term, multilevel approach in which the strongest elements are skills-based training, coaching, and assessment of practitioner performance (fidelity). There is also good evidence for practitioner selection as well as a universally acknowledged role for leadership.

A later initiative is the "active implementation framework" described by Metz et al. (2014), which has also been widely disseminated, used, and discussed in the Nordic countries. This framework includes implementation drivers related to competency (selection, training, coaching, and practice evaluation), organisation (facilitative organisation, systems programme/activity, and decision support data system), and leadership (technical and adaptive).

2.5 Knowledge transfer
Inherent in implementation is some form of knowledge transfer into action. In a thematic

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analysis of the literature, Ward et al. (2009) identified five components in knowledge transfer:

- Problem identification
- Knowledge/research development and selection
- Analysis of context
- Knowledge transfer activities or programmes
- Knowledge/research utilisation

Problem identification refers to when an issue or a need is identified in the world of practice rather than being imposed or assumed by researchers. In education, problem identification should come from teachers, school principals, administrators, school owners, or politicians. An example of this could be the challenges experienced by local municipalities, principals, and teachers in regard to implementing a more inclusive practice in general education.

Knowledge/research development and selection is the stage during which researchers choose how to produce, synthesise, and adapt research knowledge. These decisions are frequently guided by the belief that research aligned with user needs is more likely to be successfully transferred into practice. By contrast with Ward et al., other researchers have suggested that it is the specific characteristics of the knowledge itself that leads to a more optimal transfer into practice.

Analysis of context refers to the phase in which focus is on the organisational, individual, environmental, or structural factors that determine the context of transferring knowledge into action. These factors could include the motivation and background of user-groups, the presence of systems for connection between users and researchers, or the specific institution's or organisation's readiness for change.

Ward et al. (2009) mention two main types of *transfer activities*: distribution-type and linkage-type. Distribution-type activities are targeted at dissemination, marketing, and the use of local key persons. Linkage-type activities involve interaction, dialogue, and the use of intermediaries. Regardless of which transfer activity is chosen, the focus at this stage also is on the actions connected with the use of knowledge transfer actions. These actions are often characterised as a cycle of activities focused on selection, tailoring, implementation, and evaluation of the activity or intervention.

Knowledge/research utilisation refers to conceptual use, direct use, political use, or procedural use. It also includes monitoring and sustaining knowledge use and assessing impact.

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In their thematic analysis, Ward et al. (2009) also found that the five components could be arranged in three knowledge-transfer processes:

- A linear process
- A cyclical process
- A dynamic multidirectional process

The *linear process* involves a stepwise progression between individual components with identifiable start-points and end-points. The process, described in Davis et al. (2003), starts with raising awareness of research results, then involves coming to agreement about the use of research, followed by the adoption of a procedure and ending with adherence to the procedures. In the linear process, the interaction between the components can be unidirectional or, as Grol & Grimshaw (1999) point out, bidirectional, where a certain degree of reinvention is possible if barriers to the implementation need to be revisited.

In the *cyclical process* described by Graham et al. (2006), while the components are still linked via a stepwise progression, the process is interacting and ongoing. The initial component is identification of a problem and the selection of relevant knowledge. This is followed by adaptation of knowledge to a local context, the selection of the programme or activity, monitoring of knowledge use, the evaluation of outcomes, sustained knowledge use or adjustment of knowledge use and programme/activity – and so on. The cyclical process was found by Ward et al. (2009) to be the most frequent.

In the *dynamic multidirectional process,* the individual components are not linked in a linear fashion but occur simultaneously or in different sequences, and many different actors, and activities are involved. The role, attitudes, and relationships between individuals are often expressly included as components in the model.

The dynamic multidirectional process of knowledge transfer emphasises the personal nature of the process, focusing on the connection and exchange between the users and producers of research. The roles and attitudes of individuals and relations between them are often major components in this model. The relations are illustrated in the figure below.

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Figure 2.1 Conceptual framework of the knowledge transfer process (Ward et al., 2009, p. 163)
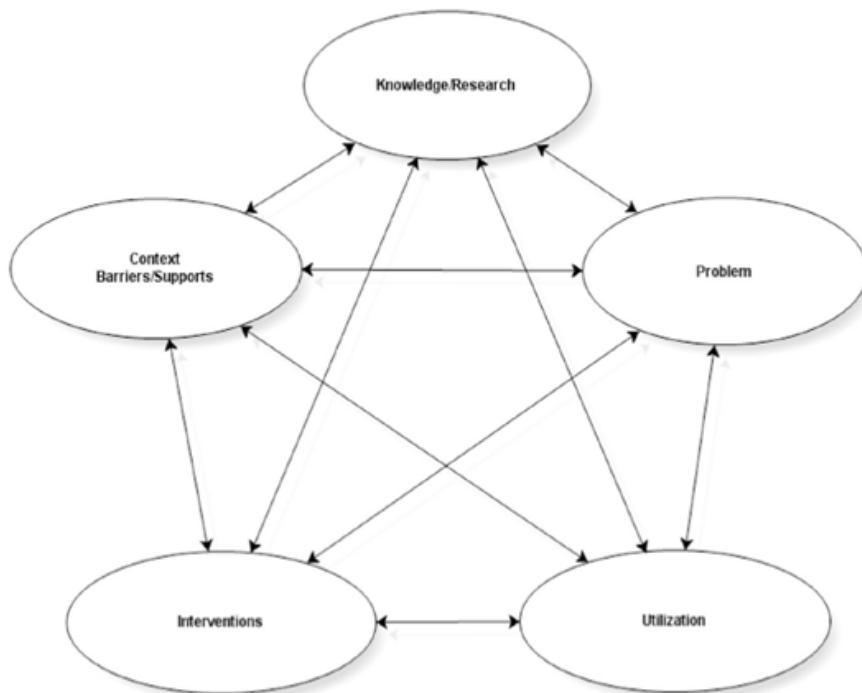
2.6 Dimensions of and factors affecting implementation

Meyers et al. (2012a) developed the quality implementation framework based on results from the synthesis of 25 implementation frameworks. According to Meyers et al. (2012), there are four implementation phases comprising fourteen critical steps. Ten of these steps should be considered before implementation begins; quality implementation results when several of the activities, including assessment, negotiation and collaboration, organised planning and structure, and personal reflection and critical analysis, are combined. The four phases are: (1) initial considerations regarding the host setting, (2) the creation of a structure for implementation, (3) ongoing structure once implementation begins, and (4) the improvement of future applications. The four phases and the fourteen critical steps can be seen in Table 2.1.

Meyers et al. (2012b) subsequently continued their work on the quality implementation framework by developing a quality implementation tool to include considerations for practitioners, funders, and researchers/evaluators. The tool has six components: (1) developing an implementation team, (2) fostering supportive organisational/community wide climate

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and conditions, (3) developing an implementation plan, (4) receiving training and technical assistance, (5) instituting practitioner–developer collaboration, and (6) evaluating the effectiveness of the programme/activity. The last component in particular comprises seven action steps that are of interest when considering implementation quality:

- Measuring fidelity of implementation (i.e. adherence, integrity)
- Measuring dosage of the innovation
- Measuring quality of delivery of the innovation
- Measuring participant responsiveness
- Measuring degree of programme differentiation
- Measuring programme reach
- Documenting all adaptations that are made to the innovation.

Table 2.1 Quality implementation framework

Phase one: initial considerations regarding the host setting
Assessment strategies
1. Conducting a needs and resources assessment
2. Conducting a fit assessment
3. Conducting a capacity/readiness assessment
Decisions about adaptation
4. Possibility for adaption
Capacity-building strategies
5. Obtaining explicit buy-in from critical stakeholders and fostering a supportive community/organisational climate
6. Building general/organisational capacity
7. Staff recruitment/maintenance
8. Effective pre-innovation staff training
Phase two: creating a structure for implementation
Structural features for implementation
9. Creating implementation teams
10. Developing an implementation plan
Phase three: ongoing structure once implementation begins
Ongoing implementation support strategies
11. Technical assistance/ coaching/supervision
12. Process evaluation
13. Supportive feedback mechanism
Phase Four: Improving future application
14. Learning from experience
Meyers et al (2012a) pp 468

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Phase one in the quality implementation framework (Meyers et al., 2012a) involves various different assessment strategies regarding organisational needs, innovation–organisational fit, and capacity or readiness assessment. Thus its primary focus is on the ecological fit between the host setting and innovation. There are eight critical steps in this phase, covering the initial steps in implementing evidence-based programmes or activities. Management and leadership have a crucial role in all eight steps. It is in this phase that a supportive climate for implementation and a secure buy-in from key leaders and frontline staff should be established.

Phase two focuses on creating a structure for implementation. The critical steps here are ensuring both a precise implementation plan and that there is a team of professionals with the qualifications to take responsibility for the actual implementation. Phases one and two are the preliminary preparation for the actual implementation of the programme/activity.

Phase three covers the actual implementation process and consists of three important tasks: the provision of ongoing assistance to frontline professionals, the monitoring of ongoing implementation, and the creation of feedback mechanisms such that involved parties can follow the progression in the process.

Phase four consists of only one critical step – learning from experience. It is at this stage that the implementation process can be modified based on experiences with ineffective and effective strategies and critical self-reflections about one's own efforts, mistakes and successes. These reflections can improve the quality of the implementation of the programme/activity and in this way ensure sustainability.

In phase three and four it can be wise to include the action steps outlined in the sixth component of the quality implementation tool for evaluating the effectiveness of the programme/activity (Meyer et al., 2012b).

Humphrey et al. (2016) state in their handbook that while implementation is a multidimensional construct, there is general agreement on that eight dimensions can be identified within it (ibid. p. 6):

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Table 2.2 Dimensions in implementation

Dimension	Content
Fidelity/adherence	The extent to which implementers adhere to the intended treatment model
Dosage	How much the intended intervention has been delivered and /or received
Quality	How well different components of an intervention are delivered
Reach	The rate and scope of the participation
Responsiveness	The degree to which participants engage in the intervention
Program differentiation	The extent to which intervention activities can be distinguished from other existing practices
Monitoring of control/ comparison groups	Determination of the 'counterfactual' – what is taking place in the absence of the intervention
Adaptation	The nature and extent of changes made to the intervention

The handbook also describes five factors that are believed to affect implementation (ibid. p.7):

Table 2.3. Factors in implementation

Factors	Content
Preplanning and foundations	What is the level of need, readiness and capacity for changing the setting where the intervention takes place?
Implementation support system	What strategies and practices are used to support quality implementation?
Implementation environment	What are the influential contextual and compositional characteristics in the setting where the intervention takes place?
Implementer factors	What is the profile of professional characteristics, intervention perceptions and attitudes, and psychological characteristics among implementers?
Intervention characteristics	What form does the intervention take?

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3 The narrative synthesis

Searches in the international databases yielded 10,077 references. After identification of duplicates and screening for relevance, 73 references remained for assessment of weight of evidence, leaving 34 studies for use in the narrative synthesis. The procedures for search, screening, and assessment are described in appendices 2 and 8.

With the assessment complete, it is possible to compare the studies included in the assessment (appendix 4) with those selected for the narrative synthesis (appendix 5). The main difference here is that out of a total of 24 case-studies, only six were assessed as having sufficient weight of evidence to be included in the synthesis, owing to three main deficiencies in the evidence base. First, teachers' own perceptions of their work were disproportionately frequent as outcome variables; second, the sample sizes were small and often self-selected; and third, a theoretical and empirical foundation was lacking. Many of the excluded studies cover conceptual aspects of knowledge use, which are more difficult to operationalise than knowledge used in clearly defined instrumental programmes or activities.

Of the 34 studies in the narrative synthesis, nineteen are from the United States, five from the Nordic countries, one from Finland, four from Norway, and three from England. One study each from Canada, Ireland, Scotland, New Zealand, and the Netherlands is included. Finally two studies cannot be attributed to one specific country, either because they collect data from more than one country or because the study is a systematic review (see Appendix 5 for a full characterisation of the studies).

3.1 A theoretical model for the narrative synthesis
The point of departure in this present systematic review of quantitative and qualitative empirical research is the question of what enables the effective use of research in schools. This question also aims to identify initiatives, strategies, methods, programmes, and activities that promote or hinder the use of research-based knowledge in primary and lower secondary school.

Before a theoretical model of implementation processes was established, all 34 studies in the present synthesis were analysed in a search for common or shared themes. The reason for dividing the studies into themes is to explore relationships within and across the included studies. These relationships could be identified either as those between characteristics of individual studies and their reported findings, or those between the findings of different studies.

During the process of developing a synthesis, six themes were identified as central in the

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studies included: (1) management and leadership, (2) professional development, (3) support systems, (4) fidelity, (5) attitudes and perceptions, and (6) sustainability. In the course of the analysis it became evident that consideration of all of these areas is essential to when looking at implementation processes in general, both in regard to more conceptual initiatives (e.g. whole-school reforms or teachers' own use of research) and in regard to more specific programmes (e.g. PALS) for the use of evidence-based knowledge in practice.

It should be noted that results from a single study may in numerous cases be included in more than one of the above-mentioned themes; therefore, some repetitions will occur. The table below situates the 34 selected studies in the respective themes.

Table 3.1 Themes in studies

Theme 1: Management and leadership. Andreassen & Bråten (2011); Barker (2011); Benjamin (2011); Berger et al. (2014); Bishop et al. (2012); Quint et al. (2015); Roland (2012); Wall (2012).
Theme 2: Professional development. Andreassen & Bråten (2011); Barker (2011); Bishop et al. (2012); Bowers (2011); Bradshaw & Pas (2011); Bradshaw et al. (2012); Cane & Oland (2015); Copur-Gencturk et al. (2014); Eli et al. (2014); Festas et al. (2015); Topping et al. (2012).
Theme 3: Support systems. Barker et al. (2011); Becker et al. (2014); Berger et al. (2014); Bishop et al. (2012); Bradshaw et al. (2011); Cale & Oland (2015); Collins et al. (2014); Quint et al. (2015); Wolpert et al. (2013); Woodbridge et al. (2014).
Theme 4: Fidelity. Andreassen & Bråten (2011); Clarke et al. (2014); Coffee & Kratochwill (2013); Cross et al. (2015); de Kock & Harskamp (2014); Festas et al. (2015); Korkeamaki & Dreher (2011); Lynch et al. (2012); Mayer (2012); Sørlie & Ogden (2015); Sørlie et al. (2015); Wilson & Tanner-Smith (2013); Woodbridge et al. (2014).Theme 5: Attitudes and perceptions. Benjamin (2011); Bishop et al. (2012); Cane & Oland (2015); Crompton & Keane (2012); Festas et al. (2015); Leadbeater et al. (2015); Lee (2012); Roland (2012).
Theme 5: Attitudes and perceptions. Benjamin (2011); Bishop et al. (2012); Cane & Oland (2015); Crompton & Keane (2012); Festas et al. (2015); Leadbeater et al. (2015); Lee (2012); Roland (2012).
Theme 6: Sustainability. Bishop et al. (2012); Leadbeater et al. (2015); Lynch et al. (2016).

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The first theme is the role of **management and leadership** when implementing externally produced evidence in situations in which planning and foundation, analysis of implemen-

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tation environment, decision on strategy for professional development and establishing a support system all take place (Durlak & DuPre, 2008; Fixsen et al., 2005; Humphrey et al., 2016; Nelson & O'Beirne, 2014; Ogden & Fixsen, 2014; Ward, 2009). Management and leadership have a crucial role before, during, and after implementation.

The next theme is **professional development**. This area covers the dosage and the reach of professional development needed to implement the use of research-based knowledge in programmes or practices of known dimensions (Fixsen et al., 2005; Humphrey et al., 2016; Ogden & Fixsen, 2012).

The third theme concerns the **support systems** available before, during, and after the implementation of externally produced evidence, as well as the professionals comprised in these and their role (Humphrey et al., 2016; Nelson & O'Beirne, 2014; Ogden & Fixsen, 2012). Some forms of support system, especially coaching, could have been placed under the theme of professional development, but in this synthesis it was decided that placement under the theme of support systems is most logical as coaching is closely related to consultation.

Theme four is **fidelity**, where the focus is on the degree to which instructions are followed and the impact of fidelity on the effect of the programme or activity (Dane & Schneider, 1998; Fixsen et al., 2012; Humphrey et al., 2016).

The fifth theme is **perceptions and attitudes** among the professional staff and their responsiveness to and adaptation of the changed routines and practices (Durlak & DuPre, 2008; EC, 2007; Goldacre, 2013; Humphrey et al., 2016; Nelson & O'Beirne, 2014; Rogers, 2002; Tseng & Nutley, 2014).

The final theme is the **sustainability/life cycles** of activities or programmes of known dimensions observed over time (Humphrey et al., 2016).

All six themes must be considered when looking at implementation processes. It is a characteristic fact that they are the cornerstones in a dynamic multidirectional process in which all have mutual influence (Ward, 2009). The dynamics are illustrated in Figure 3.1, which shows that all six themes constantly intertwine before, during, and after implementation in both conceptual and specific programmes, interventions, and activities.

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Figure 3.1 in the theoretical model for the narrative synthesis
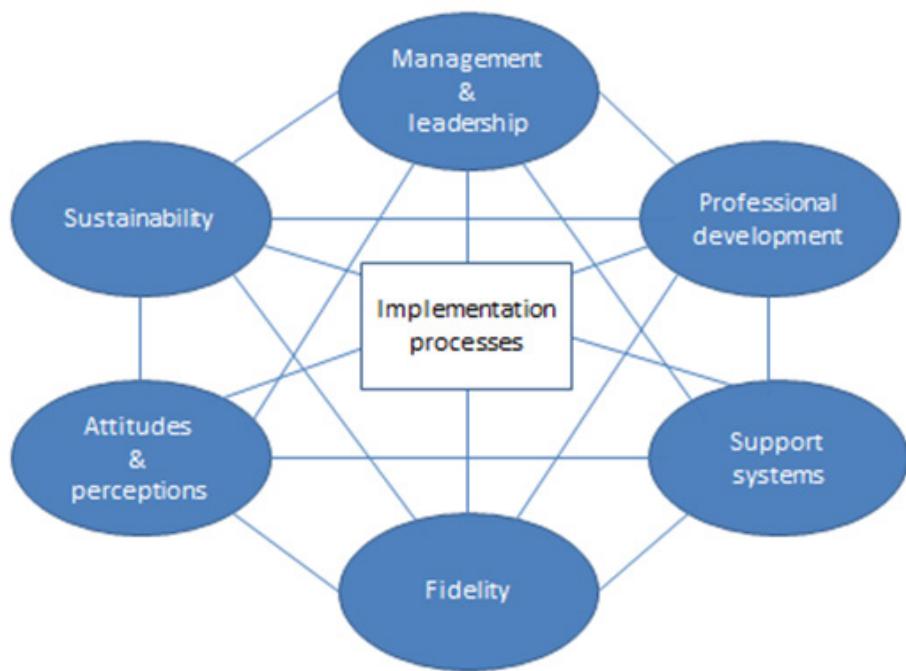
In the following section, the studies under each theme are presented in detail. Studies that cover more than one theme are presented most fully under the theme that is most relevant. In the detailed presentations, the principal findings are highlighted in bold.

3.2 Theme one: management and leadership

The first theme is **management and leadership**. This includes the implementation, planning, and foundation of new programmes or practices, analysis of the implementation environment, the decision of the strategy for professional development, and the establishment of support systems. Theoretical and practical aspects of this are covered by Durlak & DuPre (2008); Fixen et al. (2005); Humphrey et al. (2016); Nelson & O'Beirne (2014) and Ward, 2009) in chapter 2.

Four main studies are included in this theme (Barker, 2012; Quint et al., 2015; Roland, 2012

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and Wall, 2012). All of these focus on the implementation of a school-wide programme or practice. The first study looks at early identification and support for students with learning and behaviour needs; the next two studies are on academic programmes; and the last is on behaviour modification. The studies are presented in Table 3.2 below.

Table 3.2.: Table illustrating studies within the theme management and leadership

Study	Country	Program/ practice	Target	Design
Barker (2012)	USA	Response to intervention (RtI²)	School-wide	Qualitative comparative
Quint et al (2015)	USA	Success for All (Reading programme)	School-wide	RCT
Wall (2012)	USA	Formative assessments in mathematics	School-wide	Case study
Roland (2012)	Norway	The Respect Programme (Reduce and prevent challenging behavior)	School-wide	Case study

The results are supplemented by the findings of four other studies whose main focus is on issues other than management and leadership. These studies (Andreassen & Bråten, 2011; Benjamin, 2011; Berger et al., 2014; Bishop et al., 2012) are described in detail under other themes.

3.2.1 The role of management and leadership

Barker's thesis **(2011)** is a qualitative comparative study examining three core components of a framework implementation at two elementary schools in a county of southern California entitled RtI2. Response to Intervention (RtI) is a framework used to identify at-risk school students and ensure their responsiveness to general education. It is a multi-tier approach in which at-risk students with learning and behaviour needs are supported by various research-based instructions and interventions. RtI² is an extension of the original RtI framework,

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using a data-driven problem-solving model to identify specific student needs.

The study investigates the contribution of the following three areas to successful implementation of RtI^2: (1) leadership attributes, skills and practices; (2) professional development practices and new roles; and (3) general education teachers, special education teachers, and support staff.

The schools had implemented RtI for a minimum of three years and were recommended by members of the county RtI^2 taskforce. The researcher carried out semi-structured interviews with ten participants at each school and thus a total of twenty participants were taking part. At each site the participants included a principal, six classroom teachers, and three support staff (a psychologist, a speech pathologist, and a special education teacher).

The author draws six conclusions based on the results. **The first conclusion was that the school staff viewed the principal's "knowledge of curriculum, instruction, and assessment" as the most critical behaviour for successful RtI^2 implementation.** This refers to school principals' knowledge of best practice, in other words to their knowledge of the current curriculum, instruction, and assessment practices based on the needs of students. When principals know the linguistic, emotional, and educational needs of their students, they are better able to determine appropriate curriculum and instructional practices. In addition to knowing the curriculum, instruction, and assessment, site leaders needed a strong understanding of RtI^2 processes and procedures as well. **The most frequent responses regarding leader behaviour that was seen to hinder implementation efforts were "lack of knowledge" and "unrealistic expectations."**

The second conclusion also addressed leadership behaviour. Five additional leadership behaviours were identified as being important for successful RtI^2 implementation, though to a lesser degree than the knowledge identified in conclusion one above. These were: flexibility (when principals can adapt their leadership behaviour to the needs of the current situation and are comfortable with dissent), the capacity to be an optimiser (when principals can inspire and lead new and challenging innovations), monitoring/evaluation (when principals monitor the effectiveness of school practices and their impact on student learning), the capacity to be agents of change (when principals are willing to challenge and do actively challenge the status quo), and finally culture (which fosters shared beliefs and a sense of community and cooperation).

Out of the six factors mentioned above, five (knowledge of curriculum instruction and

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assessment, flexibility, being an optimiser, monitoring/evaluating, being a change agent) were behaviours which correlated with "second-order changes": that is, changes that involve innovations or changes in values and beliefs. These changes may be in conflict with prevailing values and norms. They are complex and non-linear, and affect every aspect of the system. As a reform effort, RtI^2 – which requires a shift in thinking and a change in the way in which students receive services – requires a leader who understands change efforts. The degree to which a school principal demonstrates these behaviours may vary depending on the stage of implementation.

The study also identified factors that hindered implementation. The two topics frequently mentioned were lack of knowledge and unrealistic expectations. Other areas were also mentioned: resistance to change, lack of focus/vision, lack of communication, and lack of resources.

The overall conclusion of the study was that the impact of reform efforts such as RtI^2 is heavily dependent on instructional leadership, professional development opportunities, and the availability of human and material resources.

In a study by **Quint et al. (2015)** conducted in the Midwestern United States, the primary purpose was to evaluate the impact of a scheme entitled SFA (Success For All) on elementary school students' reading achievement compared to that of students in non-SFA schools.

SFA aims to improve the reading skills of all children, but is especially directed at schools that serve a large number of students from low-income families. SFA involves a reading programme from kindergarten up to grade six that uses extensive cooperative learning in pairs and small groups. One-to-one or small-group tutoring is used for students falling behind grade-level expectations. Frequent criterion-referenced and instruction-based formative assessments are used to ensure that all students are on track in terms of their learning achievements, and quarterly benchmark assessments are used to track progress in meeting grade-level expectations. Moreover, a solutions team works to prevent or solve problems that go beyond academic content. In order to achieve the above, the schools receive staff training, extra staff, coaches who work with the school staff to implement SFA, an SFA facilitator who helps all teachers with programme implementation, ongoing professional development, and school-wide assessments. This amounts to leadership development that engages the principal and school-leadership team in a continuous improvement process based on data analysis, goalsetting, and achievement monitoring.

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The study also investigates the implementation of the SFA model. It had three primary goals: (1) to measure the fidelity with which the programme model is put into place; (2) to assess the contrast between the treatment and the control in educational experience; and (3) to document the implementation process and the lessons for scale-up and replication.

The research design chosen was a randomised controlled trials. The 37 primary schools were randomly assigned to treatment (for nineteen schools) or control group (for eighteen schools). The study investigated two groups of students: the primary sample, students who had experienced SFA from their first year in school (approximately 3,000 kindergarten students); and the auxiliary sample, students who had not received the intervention at the beginning of their school experience. Students were assessed on reading skills in the fall of the 2011/12 school year, and assessed annually in the following three years on various developmentally appropriate measures of reading achievement.

The study also investigated implementation fidelity by means of a variety of measures. The key source of information on implementation fidelity was the School Achievement Snapshot. The snapshot was completed for each school at the end of the school year by the particular school's SFA coach. It contained 40 items relevant to the presence or absence of school-wide structures associated with the programme model, along with twenty items describing classroom processes. Logs were collected from first- and second-grade reading teachers in each of the 37 study schools in the spring of 2012, 2013, and 2014, with an expected sample of approximately 48 logs per school. Surveys were collected for principals and teachers in control and experimental schools to illuminate the contrast in treatment represented by implementing SFA. Interviews with principals and teachers were carried out to give insight into the implementation of SFA.

The results related to the impact of SFA showed that it improved students' phonetic abilities, had no effect on student comprehension or reading fluency, had a positive impact on students with low pre-literacy skills, but had no effect on special education and grade-retention rates. The authors also calculated the total cost of SFA: the programme cost $ 217 more per student per year in SFA schools than in control schools.

The implementation of SFA was related to the commitment of the school principal and the SFA coach. In each instance where schools were rated as not having a fully involved principal, the overall snapshot score (implementation fidelity) was low. The SFA coach also promoted the implementation process. All SFA schools were supposed to employ a SFA coach full time for the implementation. However, some coaches were not full time and some

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were also asked to perform other than SFA tasks. Schools with full-time committed SFA coaches had an average implementation score of 89 per cent, while those that did not have a SFA coach had an average implementation score of 59 per cent. According to the survey, 83 per cent of teachers believed that the SFA coaches provided teachers with useful feedback.

These results showed that successful implementation did not appear to be related to SFA essential training. School principals and teaching staff at nineteen schools received essential training in SFA at some point during the implementation, but they varied in when they received it, who received it, and how much they got. Fifteen of the nineteen schools were rated on the snapshot as having received this training during the first year of the implementation, while the remaining four received it first only at a later point. By year three, teachers generally found the SFA training that they had received at the start of the year – whether directly from SFA or not – to be only somewhat useful. That said, there is no real evidence that SFA's provision of essential training was associated with a school's snapshot score (fidelity implementation) in any given year. Some higher-scoring schools received training and others did not, and the same is true of lower-scoring schools. **The result indicates that essential training is less useful in terms of implementation, but that continuing support (through the SFA coach and principal) is the key for successful implementation.**

The study by **Wall (2012)** examined staff perceptions of the implementation of common formative assessment, and considered what kinds of leadership and cultural ideals contribute to the effective use of these assessments.

Common formative assessment is a process that partners the teacher and the students to systematically gather evidence of learning, with the goal of using this evidence to improve student achievement. At the school described in this study, formative assessments were developed and administered regularly at grade-level to all students, with the purpose of monitoring student progress in line with common statewide standards (grade-level expectations or GLEs). Students were provided with additional support if necessary in order to meet proficiency standards. In order to equip the school with the necessary knowledge and resources to carry out common formative assessments, school improvement money allocated by the district was used to enrol leadership members in a professional development programme.

In terms of methodology, a qualitative case-study design was applied, using multiple data sources including interviews, focus groups, observations, a survey, and document analysis.

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Data is collected at one upper elementary school catering to students in grades three to five, located in the Midwestern United States.

Regarding the results of the study, the author claims that the implementation of common formative assessments led to a 29 per cent improvement in mathematics scores; however, this was not proven, but rather perceived to be the case among the individuals interviewed and observed for the study. Thus an improvement in students' mathematics achievement since the implementation of common formative assessments is not convincingly explained by the main study variables.

Overall, three major themes emerged during data analysis, revealing how the effective use of assessment is linked to changes in curriculum, instruction, and use of data. These were: (1) the focus and alignment of curriculum, instruction, and assessments; (2) the use of data to drive instruction; and (3) the use of differentiating instruction to meet student learning needs. Furthermore, **four predominant types of leadership were found to facilitate the implementation and effective use of common formative assessments: (1) renewal leadership, (2) moral/ethical leadership, (3) instructional leadership, and (4) distributed leadership.** Among the cultural characteristics that contributed to successful implementation efforts, re-culture, collaboration, high expectations, and caring relationships were found to be especially valuable. The study informants describe how students subsequently took up the changes implemented at the school by working harder and being supportive of the intervention.

Teachers described the implementation of common formative assessment as being hard at first, but after the initial start-up period, only positive statements were made regarding the implementation of the intervention. A picture was drawn of a staff and leadership united in being on board and engaged in the concept, and a school that had experienced positive changes in cooperation between teachers and the school climate. As for **factors hindering the implementation of common formative assessments, teachers, as mentioned, described the start-up period as difficult and overwhelming, and the principal had to struggle to get everyone on board, resulting in the loss of some staff members.**

The PhD thesis by **Roland (2012)** investigated the key challenges of implementing the Respect programme in two Norwegian schools. The programme aimed to reduce and prevent challenging behaviour such as concentration difficulties and bullying. Representatives from among teachers as well as the school principals were included in the Respect group in each

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school, and their main task was to promote and support the implementation of the work of Respect in their school. Previous research showed there had been great variation in the effects of the Respect programme when implemented in a range of schools.

The aim of the study was to gain an understanding of the challenges encountered by teachers during the implementation process of the Respect programme, and to discuss this in relation to implementation quality. Implementation quality was defined both as how an implementation programme was intended to be carried out and how it actually was carried out.

The study was a case-study following two Norwegian schools. The schools were selected from those that had taken part in the Respect programme between 2005 and 2007. The programme lasted two years. Qualitative interviews were carried out at three points in time: six months after the programme started, one year into the programme, and two years after the programme end.

The first two rounds of interviews were individual interviews with four teachers from each school, including two teachers from the Respect group and two teachers not involved in the group. The participants were randomly selected among the teaching staff. A total of eight teachers took part in school A, and a total of seven in school B. At the third interview, participants who had taken part in the first two rounds of interviews were invited to take part in a focus group. Five teachers from school A took part in the focus group, as did three teachers from school B.

Field notes were taken by the researcher at three points in time: At the onset of the implementation, one year into the programme, and two years after the programme end. At this last stage, participants were able to give feedback on the results.

The results of the study showed a great discrepancy between the way in which the Respect programme was intended to be carried out and how it was actually carried out. Thus the quality of implementation was low in both schools. The quality of implementation was affected by both process factors and organisational factors. Roland identified the following process factors: clarity, expectations and responsibility, collective understanding, and resistance to change.

Both schools changed principals during the implementation period, which affected the implementation adversely. Teachers in both schools believed that the principals should have encouraged stronger teacher obligation to the programme. They perceived their leaders as

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"invisible" in the implementation process, and overall they described a lack of direction and leadership from their principal.

The lack of leadership appeared to be the primary reason for the implementation failing in both schools. Teachers were unclear about the principles of the Respect work. There was no shared understanding of the Respect principles, although everyone agreed that it was the key to a successful implementation. There were no principals who encouraged an obligation to the Respect work. No one felt responsible for the Respect work, not even teachers in the Respect group who were supposed to be the driving force of the implementation. Thus the implementation failed to have the intended effect in both schools.

3.2.2 Results from the four supplementary studies

Andreassen & Bråten (2011) mention that to ensure better implementation of educational programmes and activities, **the school administration may need to play a more active role and provide administrative support for changes in their teachers' practice.**

In the study by **Benjamin** (2011), teachers indicated that **the principal was instrumental in creating a safe environment for learning of the RtI² process. They also expressed that trust and shared leadership were behaviours and practices demonstrated by the principal that supported the intervention implementation.**

Berger et al. (2014) conclude that **high turnover rates for school principals– and teachers – have the capacity to impede programmes that rely on training and personal development, making the goal of obtaining school-level effects and extensive culture change harder to reach.**

Studies performed by **Bishop et al.** (2012) find that **uneven institutional support provided by principals is closely related to uneven implementation of programmes.**

3.2.3 Summary of the theme management and leadership

A few key points across the eight studies included under the theme **management and leadership** can be summarised as follows. School leaders and school management teams should:

- Lead the way
- Demonstrate committed and continuous support
- Show flexibility and give personal support
- Have knowledge about curriculum, instruction, and assessment processes

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- Help staff in their daily practice
- Give administrative support to the teachers
- Show trust and shared responsibility in the management teams
- Support team members in promoting implementation processes
- Show realistic expectations

3.3 Theme two: Professional development

The second theme is professional development, and this theme includes studies whose primary focus is on various different types of training and development to support programmes or activities. Theoretical and practical aspects of this have been covered by Humphrey et al. (2016) in chapter two.

The theme is covered in detail by nine studies (Andreassen & Bråten, 2011; Barker, 2011; Bowers, 2011; Bradshaw et al., 2012; Cane & Oland, 2015; Copur-Gencturk et al., 2014; Ely et al., 2014; Festas et al., 2015; Topping et al., 2012). All but one of these focus on the implementation of a school-wide programme or activity. The first study concerns a framework for the early identification and support of students with special needs. The next six studies cover academic programmes: five on reading and writing and one on science. The last two studies focus on mental health in schools. The studies are presented in Table 3.3 below.

Study	Country	Program/practice	Target	Design
Barker (2011)	USA	Response to intervention (RtI^2)	School-wide	Qualitative comparative
Topping et al (2012)	Scotland	Paired Reading peer tutoring	School-wide	Quasi-experimental
Andreassen & Bråten (2011)	Norway	Reading Comprehension Instruction	School-wide	Quasi-experimental
Ely et al (2014)	USA	Intensifying Vocabulary Intervention (multimedia-based)	Pre-service teachers training	Experimental design with posttest-only
Festas et al (2015)	USA	American Self-Regulated Strategy Development Instruction (writing strategies)	School-wide	Matched pairs design

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Bowers (2011)	USA	Reading First Program	School-wide	Quasi-experimental
Copur-Gencturk et al (2014)	USA	Reform-oriented science instruction	School-wide	Mixed methods
Bradshaw et al (2012)	USA	School-Wide Positive behavioral Interventions and Supports (SWPBIS)	School-wide	RCT
Cane & Oland (2015)	UK	Targeting Mental Health in Schools (TaMHS)	School-wide	Cross-sectional study

3.3.1 The role of professional development

The PhD thesis by **Barker (2011),** described in detail under the previous theme, **management and leadership**, reported two important results regarding the theme of professional development.

One is that **professional developmental practices were necessary for the initial and continuous implementation of RtI² reform effort**. Principals, teachers and support staff all indicated that a number of opportunities were made available to them by the county office of education prior to and during implementation. However, the study describes these in very little detail. The initial professional development was broadly described as focusing on "RtI2 processes, procedures, and practices." Continuous professional development included opportunities for teachers and support staff to reflect on their current practices and acquire new instructional strategies based on student needs.

The other conclusion from the study was that the professional practices that encourage collaboration through teams were crucial for RtI2 implementation efforts. **Professional development practices that encouraged collaboration in the form of teams allowed teachers and support staff to focus on student achievement, creating opportunities to share experiences of instructional practice.**

The overall conclusion of the study was that **the success of reform efforts such as RtI2 depends on instructional leadership, professional development opportunities, and the availability of human and material resources.**

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The purpose of a study by **Topping et al. (2012)** was to describe the process and outcomes of peer tutoring in reading in primary schools in Scotland, and to assess the implementation quality of the tutoring technique of paired reading. Following students for two years, the study examined the effectiveness of cross-age versus same-age tutoring, light (once per week) versus intensive (three times per week) intervention, and reading versus reading and mathematics tutoring.

Paired reading (PR) is a structured cross-ability tutoring technique for supported or assisted reading. It is applied to books of the students' choice but above the tutee's independent readability level, and involves both reading together and reading alone. Specifically, the tutor supports the tutee through difficult text by reading together. The tutoring pair read all the words aloud together, with the tutor modulating their speed to match that of the tutee while giving a good model of competent reading. The pair agrees on a sign for the tutor to stop reading together; then when an easier section of text is encountered, the tutee signals and the tutor stops reading aloud, while praising the tutee for being confident. Sooner or later while reading alone, the tutee makes an error that he or she cannot self-correct within four seconds; then the tutor applies the usual correction procedure and joins back in again in reading together. The pair switches from reading together to reading alone many times during a session of thirty minutes. The tutoring continued for 15 weeks in the first year and was repeated in the second year for the same students, many of whom had a new class and new teacher.

In the beginning and at the end of the intervention periods teachers were trained in the PR method. Two in-service days – one half-day training session early in the intervention and another half-day training session late in the intervention – were provided to participating teachers. The first (early) session involved a context-setting talk from a senior manager of the school district, followed by a talk about the tutoring technique and how to organise it, using illustrative video clips. Teachers were also divided into smaller groups representing the different types of intervention, giving teachers opportunities for networking between schools. The second (late) session provided teachers with presentations from teacher colleagues who had implemented the PR method successfully. It also represented an opportunity to provide feedback and discuss the tutoring technique. The teacher training was repeated in the second year for new teachers. In addition, a resource pack was made available to all schools, mainly consisting of practical materials for teachers to give to participating students and organisational advice for the teacher her/himself.

Prior to the intervention, teachers instructed participating students specifically in the PR

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tutoring technique. Teachers also monitored and supported the students during the intervention periods (a teacher checklist for observation was made available). In addition, research assistants supported the schools in achieving high fidelity of implementation. However, they did this only on request, by visiting schools individually or by holding discussion sessions for a group of schools. In these visits and sessions they were thus working with the teachers' definition of the problem, not the problem as they had observed it themselves.

The study used a quasi-randomised controlled trial design, involving 87 primary schools from one council in Scotland. Participating students who were eight and ten years old as the intervention started completed pre- and post-tests over each intervention year. In both years, observational data were also collected. Within a three-week period, one researcher undertook direct observations of implementation fidelity using a structured observation schedule in a random 50 per cent of the 87 participating intervention schools. These observational process measures were used to examine to what extent tutoring pairs were actually using the PR technique.

The study found that the implementation of PR was somewhat variable, with technical aspects of correction, talking, and showing interest in the book being well implemented, while reading together exactly, tutor praising, and tutee signalling were much less well implemented. Further, the study found that tutor praise during reading alone and tutor reading together with the tutee after correction were the only variables to correlate with attainment, and they did so negatively. Other correlations fell into two groups, one to do with talking and interest in the book, the other primarily to do with correction. However, neither correlated significantly with progress in reading attainment. Therefore, the authors conclude that process factors bore little relationship to reading attainment.

On the basis of these findings the authors **suggest that teachers should be provided with more training, preferably spread over time. This training should incorporate practice and feedback.** Given that only some aspects of the tutoring technique had been well implemented, the authors suggest that teachers should pay particular attention to monitoring and supporting tutoring pairs with respect to reading together exactly, tutor praising, and tutee signalling. They also suggest that subsequent **direct independent observation of the teachers implementing would be good, but would add to costs considerably. A less costly alternative would be for a pair of teachers within a school to observe one another.**

The article by **Andreassen & Bråten (2011)** focuses on the implementation of an instructio-

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nal framework called Explicit Reading Comprehension Instruction (ERCI). This is based on instructional principles and practices derived from three multiple-strategy programmes of research-based, explicit comprehension instruction: reciprocal teaching (RT), transactional strategy instruction (TSI), and concept-oriented reading instruction (CORI). The study had two main objectives: to investigate the effects of teachers' implementation of ERCI on students' strategy use, reading motivation, and comprehension performance; and to investigate how these effects (or their absence) related to the quality of implementation of the intervention.

This quasi-experimental study included a total of eleven teachers and 216 fifth-grade students (five teachers and 103 students in the intervention group, and six teachers and 113 students in the control group). Students completed pre- and post-tests of strategy use, reading motivation, and reading comprehension. Pre-test data were also collected with respect to word recognition and working memory. In addition, classroom observations and teacher questionnaires were collected in order to assess to what extent the instructional framework was actually implemented in the intervention teachers' classrooms. The study's primary researcher (the first author) observed two lessons at the beginning and two at the end of the intervention period on two different days in each classroom. Each of the intervention teachers were thus observed for four lessons in all. No observations were made of control group teachers. Two questionnaires were designed: one was answered by all teachers in both groups, and the other was answered only by the intervention teachers. Questionnaires were answered at the end of the intervention period.

The ERCI instructional framework rests on a set of instructional principles and practices related to four factors: (1) relevant background knowledge, (2) reading comprehension strategies, (3) reading-group organisation, and (4) reading motivation. Over a period of 18 weeks the intervention teachers implemented the ERCI principles in their classrooms, more specifically in five social studies lessons a week. In the same period, the students in the control group were taught according to the same social studies curriculum using ordinary practices.

Before the intervention started, professional development was provided for the teachers of the intervention group during five three-hour collaborative seminars over a period of three months. No professional development was provided for the control group teachers.

The first author led the collaborative seminars in which instructional practice related to each principle was discussed. The first seminar focused on the importance of background knowledge and discussed how students' background knowledge could be activated and complemented during classroom dialogues and social interactions. The second and third

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seminars focused on the four comprehension strategies of predicting, questioning, clarifying, and summarising, and discussed how these strategies can be effectively taught in the classroom. The fourth seminar focused on reading-group organisation, with the purpose of providing the teachers with an understanding of the social aspect of comprehension instruction. Examples of how cooperative learning can be used in the classroom were also discussed. The fifth and last seminar focused on the motivational aspect of comprehension instruction, discussing for instance examples of how students can be introduced to and become interested in the topic of study.

Finally, a list of example activities developed from the seminars and was handed out to the teachers after the last seminar.

Overall, the study found that the intervention had a positive effect on students' strategic processing and comprehension performance, but no effect was observed on reading motivation. However, the observational data indicates that only the first two ERCI principles were appropriately implemented, while the last two principles seem to have been poorly implemented in all five intervention classrooms. The questionnaire data supported this finding. Thus a pattern of implementation seems to be consistent with the results regarding the student outcome variables. In other words, the implementation of the principles of relevant background knowledge and reading comprehension strategies seems consistent with the findings that the intervention had a positive effect on students' strategic processing and comprehension performance. Concurrently, the poor implementation of the principles of reading-group organisation and reading motivation seems to be consistent with the finding that no effect of the intervention was observed on reading motivation. That these two principles were unsatisfactorily implemented may also, according to the authors, have limited the effect of the intervention on comprehension performance, because self-regulatory use of reading comprehension strategies was not sufficiently promoted. In conclusion, **the study indicates that teachers may need extensive preparation and support to adequately implement new approaches to reading comprehension instruction.**

According to the authors, there are several possible reasons why the teachers participating in the intervention had difficulties implementing the principles of reading-group organisation and reading motivation, despite receiving professional development. One of these could have been professional development. The authors state that the collaborative seminars that took place prior to the intervention should have been more extensive, including, for example, the use of films to illustrate ERCI and to frame discussions about how underlying principles could be implemented in the teachers' own classrooms. Another possible explanation ad-

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vanced by the authors is that the researcher–teacher collaboration should have continued throughout the intervention period. **Thus teachers may need guidance and support with classroom implementation not only prior to, but also during the intervention, in order to manage more fundamental changes in instructional practice. Moreover, the authors highlight that it may be important to discuss and, if necessary, try to modify teachers' attitudes towards certain instructional principles and practices as part of professional development. Finally, the authors state that it may be necessary for the school's administration to play a more active role and provide administrative support for changes in the teachers' practice when implementing new programmes.**

The purpose of the study by **Ely et al. (2014)** was to explore the use of video and content acquisition podcast (CAP) in teacher preparation in order for pre-service teachers to implement evidence-based practices in their teaching. Specifically, the study examined the implementation and effectiveness of a multimedia-based vocabulary intervention (video plus CAP) on pre-service teacher learning of vocabulary practices.

This intervention tool was developed to teach a research-supported approach to vocabulary instruction called the Intensifying Vocabulary Intervention (IVI). IVI is an instructional approach intended to improve word learning by elementary students at risk for or with learning disabilities through storybook reading. The intervention combines content acquisition podcast (CAP) with a video that models effective teaching strategies. CAPs are a form of enhanced podcasting in which still images are paired with on-screen text and audio. The CAP pre-teaches the procedural steps and instructional practices of the vocabulary intervention, and sets the stage for what the viewer will see in the second part of the tool, namely a thirty-minute video that shows a teacher modelling effective vocabulary instruction (IVI) to three kindergarten students. Intervention teachers watched the CAP prior to the modelling video in order to set the stage for what they (a) were about to see, (b) should look for, and (c) should prioritise with respect to the purpose for watching the video. The comparison teachers were provided with a reading that covered the same content as the video plus CAP intervention.

The study used an experimental intervention design with post-test only. Forty-nine pre-service teachers were involved, who were enrolled either in an elementary education programme (72 per cent) or a special education programme (28 per cent) at a mid-Atlantic state university. Participants were randomly assigned to one of two treatment groups: video plus CAP (n=25), or reading (n=24).

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First, the intervention teachers watched the video plus CAP on personal laptops with headphones, whereas the comparison teachers read hard copies of the reading. All participants were given the intervention in person once during their scheduled class time. Next, participants were asked to teach a vocabulary lesson to a small group of three to four students identified as low-performing and/or with language barriers. Participants were encouraged to write down lesson steps based on the intervention that could be used during teaching. Researchers observed participants as they attempted to teach practices learned during intervention. In order to evaluate differences in the number of IVI practices implemented by participants in the video plus CAP group compared to the reading group, researchers used an IVI fidelity checklist containing a total of thirty components of IVI that can be implemented at three different points during the lesson: during storybook reading, after reading, and throughout the lesson (total number of IVI practices used by the participant). At the end of the class, participants took an online multiple-choice post-test based on IVI fidelity checklists and characteristics of IVI that were disseminated through instructional materials.

Results on total implementation show that **those who watched the video plus CAP used significantly more teaching behaviours associated with an evidence-based vocabulary practice during instruction than the comparison reading group.** Specifically, the video plus CAP group used a total of 85 per cent IVI practices, whereas the reading group used 67 per cent IVI practices. Based on these findings, **video plus CAP may offer a pathway to increase knowledge and readiness to implement an evidence-based instructional practice.** However, the authors also point out that the findings of the present study should be viewed with caution because of a relatively small sample size, among other things. Therefore, the authors conclude that more research in this area is needed, with additional participants and different content to confirm results.

The article by **Festas et al. (2015)** examined the effect on the writing performance of eighth-grade Portuguese students when implementing a version adopted in Portugal of a United States-originating Self-Regulated Strategy Development (SRSD) instruction. SRSD for opinion-essay writing promotes writing skills through explicit step-by-step instruction in general writing strategies and self-regulated strategies. (An opinion essay is a type of essay that sets out the students' personal opinion about a particular topic.)

Fourteen teachers in six urban middle schools in a major city in Portugal took part in this study. Seven of the teachers participated in the experimental group, in which teachers followed the SRSD model for writing instruction in opinion essay, and seven teachers were

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part of the control group, in which teachers implemented the schools' existing curriculum (the Portuguese language arts curriculum). A total of 380 students took part in the study: 214 in the experimental group, 166 in the control group. Teachers in the experimental group attended a practice-based professional development (PBPD) in SRSD for a three-month period, consisting of fourteen hours of professional development across two days in SRSD instructional practices before the student workshops commenced. Teachers received notebooks with guidelines and materials needed to implement all activities and lessons for opinion essay writing in their own classrooms. In the practice-based professional development, SRDS instruction was modelled, practised, and discussed. After the two-day professional development process, the teachers met with research assistants for about an hour a week to address any questions or concerns teachers had regarding the SRSD instruction and how to adjust future lessons to meet students' and teachers' needs.

The study was a matched-pairs design. The six schools were matched for parents' socioeconomic background and teacher characteristics including gender, experience, and preparation. Thus the experimental and control schools had very similar characteristics.

In the control group, a writing activities questionnaire was completed by teachers to measure how writing was taught in their classrooms. In the experimental group, two components were measured: (1) the lesson fidelity of the SRSD instruction, and (2) social validity. The lesson fidelity of the SRSD instruction was measured by a lesson checklist completed by teachers and research assistants. Teachers were given a copy of the checklist for each lesson and had to check off each step as completed when they taught. A research assistant completed the checklist by observing 25 per cent of the SRSD instructional sessions spread across the session. Social validity was measured immediately after SRSD instruction. Teachers completed the teacher's intervention rating profile, and students completed the students' intervention rating profile. This included items such as "SRSD instructions helped students to write better opinion essays," rated on a Likert scale.

In both control and experimental groups, essay writing was assessed pre-test, post-test and under maintenance (two months after post-intervention). Students were given 45 minutes to complete their opinion essay. All essays were subsequently scored by a trained research assistant, with one-third being additionally scored independently by a second trained rater. Rated in the essays were, first, structural elements – premise, reasons, explanations (why an author believed a particular statement or why they refuted a counter statement), conclusion, and elaborations (additional information on or examples of premise, reason or conclusion) – and second, number of words.

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The results showed that student essays in the experimental group significantly outper-formed student essays in the control group on structural elements in their compositions. Essay quality was also initially measured by the length, that is, by number of words. It was therefore expected that essay length would increase with SRSD instructions. However, SRSD-instructed student essays decreased in length after instruction, but became more organised with the elimination of inappropriate text. Thus the authors argued that essay length did not in fact measure better-quality essays. SRSD was implemented with acceptable fidelity. Observations found that teachers had completed approximately 78 per cent of the activities prescribed. Teachers self-reported that they had completed approximately 82 per cent of the activities prescribed. Both teachers and student reported strong social validity: that is, teachers believed that SRSD had a positive impact on the students' writing, and the students were positive about the instruction they received and found it interesting.

It is relevant to note that SRSD intervention was successful in improving students' ability to write opinion essays. The authors identify three reasons for **the success of the interven-tion. Teachers and students had positive attitudes to the SRSD programme**; it appeared that teachers implemented the intervention with acceptable fidelity; and **teachers were also supported in the intervention through professional training e.g. weekly meetings.**

The PhD thesis by **Bowers (2011)** examined elementary school students' literature perfor-mance from kindergarten to fifth grade in the United States for six elementary schools im-plementing the Reading First programme and six schools not implementing Reading First. Reading First was a US initiative specifically targeting the country's high-minority, high-poverty and low-performing schools, aiming to improve the reading skills of all students. The study closely examined and compared literacy performance data for English-language learners, Hispanic, and African American students with those for white students in order to determine whether implementation of the Reading First programme narrowed the achie-vement gap. It also explored the relationship between the level of Reading First programme implementation and the students' literacy achievement.

In this study, the Reading First implementation involved an extensive and well-funded process. The Lancaster school district established a district-wide Reading First leadership team, who served as advisers on the development plan and implementation process. Leadership teams met three to four times per year to assess and ensure full implementation of the essential components of the Reading First initiative. The essential components were: (1) teaching the Reading First curriculum with fidelity; (2) teacher collaboration focused on student learning

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and based on data from curriculum-embedded assessments; (3) high-quality professional development for teachers, coaches and administrators; and (4) coaching support.

Three full-time literacy coaches were employed to work as a resource throughout the implementation of the programme. Grade-level curriculum pacing guides were developed during the first year of implementation for all Reading First schools. The pacing guides identified weekly themes, activities, and skills to guide lesson planning for teachers. Teachers met to share their instruction experiences for between one and two-and-a-half hours a week. District and site administrators monitored classrooms and grade-level meetings, analysed data, and worked closely with literacy coaches to plan professional development so as to ensure compliance to the programme. These administrators also received professional development to ensure their ability to provide high-quality analysis and professional dissemination of student results to teachers. From 2005, teachers were offered a four-year-training programme. This included forty hours of professional development opportunities that prepared them for implementation of the programme, and an eighty-hour follow-up practice designed and led by the literacy coaches.

The research design was a quantitative quasi-experiment: six primary schools implemented the Reading First programme, and six schools did not. There were a total of twelve schools in the Lancaster school district, but only six schools in the district were eligible for funding for the Reading First programme. Reading First schools were schools of "high priority." They had more students with socioeconomic disadvantage and ethnic minorities than non-Reading First schools.

The study was conducted in two phases. In phase one, the Reading First and non-Reading First students' achievements were compared. In phase two, potential relationships between implementation of Reading First and Student achievements were examined. The literacy performance of the students was measured by the California Standards Test (CST) and by the Reading First achievement index (RFAI). CST is an assessment tool developed in California to measure student progress towards mastery of California's state-adopted content standards. The achievement index was a 100-point scale used to determine the achievement progress of participating Reading First schools. It was calculated by the state-contracted external evaluator using STAR (standardised testing and reporting) CST data and curriculum-embedded end-of-year assessments. STAR CST data was an annual assessment administered to children from second to twelfth grade in the state of California and used to assess their mastery of the California state standard.

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The level of implementation was measured by the Reading First programme's implementation index (RFII). The implementation index consists of a 100-point scale to determine the degree of Reading First programme implementation at participating schools. It was calculated by the state-contracted external evaluator based on annual survey responses from school principals, teachers and coaches who focused on programme elements, programme understanding, and professional development.

All data was collected in the 2005–2009 period. CST student achievement data was collected among second- to fifth-grade students, and RFAI student achievement data was collected among kindergarten to third-grade students.

The study found that Reading First schools experienced greater growth in CST scores than non-Reading First schools between 2005 and 2009. In addition, the study revealed that implementation of Reading First strategies is likely to have a positive impact on CST student achievement outcomes for English-language learners, African American, and Hispanic students in second to fifth grades. However, based on the Reading First implementation index and CST data collected between 2005 and 2009, the study found no significant correlation between the level of Reading First implementation and CST student achievement. The author therefore found these results inconclusive. She argued that the two measurement tools might be incompatible for comparison, and that the implementation probably needed more time to "settle" to be measurable with CST.

There was, however, a statistically significant correlation between the level of Reading First implementation index and the RFAI scores for the district. From this result the author concluded that overall growth in literacy achievement of students from kindergarten to fifth grade did occur in the schools in which the essential components of the Reading First programme were implemented. Therefore, the author recommended that school districts like Lancaster school district should work to develop district-wide literacy programmes that support and encourage **(1) teaching the Reading First curriculum with fidelity, (2) teacher collaboration focused on student learning and based on data from curriculum-embedded assessments, (3) high-quality professional development for teachers, coaches and administrators, and (4) coaching support.**

The study by **Copur-Gencturk et al. (2014)** aimed to examine the impact of a two-and-a-half-year master's degree programme on teachers' science instruction from kindergarten to eighth grade, focusing on teachers' use of reform-oriented teaching practices. Drawing

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from multiple sources of data, the authors assess the extent to which teachers applied aspects of reform-oriented teaching such as engaging with scientific questions, designing and carrying out investigations, and discussing key scientific ideas. Using evidence collected from external classroom observers, teachers and students, an investigation was conducted of which teaching practices appear to change immediately and over time, and which practices seem resistant to change. The authors also considered any potential differences in results stemming from the three distinct data sources.

The master's degree programme examined in the study was based on key aspects of successful professional development including courses focused on academic and pedagogical content, coherence across the programme, modelling of inquiry-based teaching, and alignment with national, state, and local standards. University staff collaborated with school-district administrators and school principals to plan the programme, which was an intensive, long-term professional development intervention, focused on strengthening teachers' content and pedagogical-content knowledge in science and mathematics from kindergarten to eighth grade. The courses included in the programme aimed to model teaching with a reform-oriented approach while also making connections to teachers' classrooms and asking teachers to apply what they had learned to their own teaching. This active engagement of teachers included an action-research project that was carried out by teachers to investigate how they were teaching their students. Furthermore, as part of the science content courses, teachers received resources they could use to implement course ideas throughout the school year. **All in all, the programme consisted of nine courses, structured around reform-oriented instructional practices. They emphasised inquiry and reflection, as well as incorporating the latest research and methods in science and mathematics instruction. Most courses were team-taught by university faculty members.** The overall goal for the programme was to produce change in teachers' practices in the direction of more reform-orientation and an increased focus on student sense-making, under the unifying theme: "Sense-making in mathematics and science in our world."

The programme involved 24 K-8 in-service teachers from kindergarten to eighth grade, of whom eighteen teachers were included in the study. The teachers were employed at nine elementary and two middle schools in a low-socioeconomic status school district. This high-needs district was located in an ethnically diverse, midsized Midwestern city in the United States. All in all, 726 students were included in the study, meaning that each year, one class of science students for each participating teacher was surveyed and included in the data analysis (with data included only from students above second grade). Three distinct data sources were collected:

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- *Classroom Observation Protocols*: these provided an overall assessment of lesson design and implementation, while also examining the tasks used in lessons and productive classroom discourse
- *Surveys of Enacted Curriculum (SEC)*: this was a teacher survey designed to document the curriculum and instruction implemented in mathematics and science classrooms
- *A student survey*: this was focused on students' attitudes and beliefs about science, as well as the teaching occurring in the classroom

The authors use primarily quantitative methods for data analysis in the form of multivariate statistical modelling, but also incorporate supplemental qualitative data (field notes and teacher interviews) in order to illuminate the patterns of teacher change found in the quantitative analyses of survey and classroom observation data. Teacher interviews were conducted at the end of every semester in the master's programme, with questions asked on how the programme affected the teachers' content knowledge, instructional practices, curriculum, and students, as well as what factors teachers perceived as having an effect on their implementation of course ideas in the classroom. Here the researchers paid special attention to contextual factors that might serve to influence or constrain teacher reform-oriented practices.

The results of the statistical analysis indicated trends in opposite directions for student reports and classroom observations, with teacher reports drawing a more subtle picture of teacher instructional change due to the programme.

Based on the observational data, teachers started to teach in ways more aligned with reform-oriented teaching during year one. In the second year, teachers' instructional practices reverted back somewhat, but were still significantly different from the initial practices that had been occurring before the start of the programme. Thus the programme appeared to have a positive impact on teachers' implementation of reform-oriented teaching, at least in the first year, with some regression occurring in the second year.

On the other hand, student survey data indicated that teacher practices in the first year of the programme were less aligned with reform-oriented teaching than in the year before teachers enrolled in the programme. In the second year there was a reverse in the alignment, leading to no differences in the overall amount of reform-oriented teaching between year 0 (before the programme) and year 2 into the programme. It must be mentioned here that student reports on the frequency of teacher lectures (a traditional teaching method) did reveal a trend towards fewer lectures in the first year, which then reverted in the second

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year. Drawing a different picture yet again, responses from the teacher surveys indicated a gradual shift in teacher practices towards more reform-oriented teaching across the duration of the programme, with change more noticeable in the second year.

In closing, the authors point to three programme-related issues that they consider in need of further consideration. These included the importance of extended, collaborative relationships with teachers; possible improvements in course emphases (giving more attention to issues surrounding task selection that had been difficult for teachers); and the benefits of using multiple data sources. Most importantly, the authors point to the issue of limited time for science in schools. The school district studied was struggling to meet the requirements of the No Child Left Behind policy: for many teachers, their main concern was simply to cover the mandated curriculum in time for the state tests. The pressure to prepare for tests focusing on reading and mathematics, together with the (at least perceived) mismatch between high-stakes testing and reform-oriented science instruction, made some teachers feel their focus had to be on covering the curriculum in the limited time available, thus sacrificing in-depth instruction. Thus **this study points to critical challenges faced by teachers in high-needs schools under pressure from state and district requirements. This finding sheds light on the reasons why the context of current policies and school environments should be taken into account when assessing the effectiveness of professional development programmes.** The authors conclude by stating that policies that limited time for reform-oriented science instruction probably had a negative impact on the programme under study, revealing a possible downside to the focus currently being laid on mathematics and reading.

The overall purpose of the study by **Bradshaw et al. (2012)** was to examine the implementation of the three-tiered School-Wide Positive Behavioural Interventions and Support (SWPBIS) programme in schools in Maryland. In particular, the study's purpose was to examine the implementation of the more advanced tiers of the programme. Specifically, the study aimed to conduct a comparison between schools receiving Positive Behavioural Interventions and Support (PBIS) in the form of traditional training and support in tier-one implementation from the district and state (SWPBIS) and those PBIS schools that received these forms of support in addition to support in tier-two implementation by means of tailored training and on-site coaching from an external coach (PBIS*plus*). Thus the study sought to examine variation in the impact of PBIS*plus* on students with certain characteristics, such as those at risk for entry into special education at baseline, and also for those at baseline displaying a pattern of at-risk behaviour problems. It was therefore anticipated that the effects of the PBIS*plus* programme would be strongest for those students in greatest need.

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The SWPBIS programme aims to change the entire school environment (both in and outside the classroom) by creating improved systems and procedures which promote positive changes in staff and, in turn, student behavioural social learning. The goal of SWPBIS is to prevent behaviour problems by implementing a three-tiered public health framework incorporating universal, targeted, and intensive systems of support for positive behaviour. Consistent with the RtI (Response to Intervention, see section 3.2.1 above) approach it is expected that the majority of the student population (approximately 80 per cent) will respond positively to universal SWPBIS; that 10 to 15 per cent of students will require "selective" (i.e. tier two) preventive interventions; and that the remaining 5 to 10 per cent will require intensive "indicated" support and services (i.e. tier III).

The PBIS*plus* programme builds on the three-tiered SWPBIS model and aims to enhance support for teachers and school staff members such as psychologists, administrators in the use of evidence-based practices. Specifically, PBIS*plus* focuses on tailored training in the implementation of functional behavioural assessments (FBA), in the student-support teaming process, in cultural proficiency (e.g. the Double Check model), and in evidence-based practices (e.g. Check-In/Check-Out). A two-day initial training led by a team of PBIS*plus* coaches is provided, together with an annual one-day booster session held each summer for the school teams. The PBIS*plus* programme also includes an on-site coaching model as a strategy for optimising programme implementation and enhancing outcomes. Teachers and student-support team members receive additional training and consultation through didactic group and one-to-one coaching on the implementation of evidence-based practices, led by the PBIS*plus* coaches. To promote sustainability, during the first year of the study coaches spent at least a half-day (that is, four hours) every week in each intervention school, then in years two and three of the study a half-day in alternating weeks, with the aim of promoting sustainability. Over the course of the trial, the coaches spent a total of 4,234 hours across all the schools in providing on-site coaching and technical assistance. Schools also received a binder and a CD containing materials that would support the implementation process (including action plans, forms to facilitate the functional behavioural assessment process, summaries of tier-two evidence-based programmes, and tip sheets).

The study, using a group randomised controlled trial design, involved 42 elementary schools randomly assigned to one of two treatment groups, PBIS*plus* (20 schools) and comparison (22 schools). Comparison schools continued to implement SWPBIS and receive "support as usual" from the district and state. Participating schools were enrolled in two cohorts, using an open cohort design, to ensure that intervention schools received high-quality training and support and to assist with overall project management. Schools were monitored for three

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years following enrolment in the trial. Data was collected on a total of 29,569 students and 3,202 school staff. Assessments of the implementation quality of support (using the school-wide evaluation tool and the individual student systems evaluation tool) were conducted in autumn 2007 for cohort one and autumn 2008 for cohort two, and each subsequent spring for three years. Additionally, brief interviews were conducted with school administrators, four staff members, teachers (at least eight), and students (at least twelve from each grade); observations of the school environment at a single school visit and a review of intervention planning materials were also conducted. Staff surveys were also administered to both teaching and non-teaching staff, along with teacher ratings of student behaviour, academic achievement, and referrals at the same four time-points at which the implementation of support assessments had been conducted. Finally, school-level data was obtained from the Maryland State Department of Education to examine standardised test performance in mathematics and reading, attendance rates, and suspension rates.

Overall, results for the PBIS*plus* model suggest promising impacts for the integrated tier-one and tier-two programmes on student outcome and staff factors. Specifically, the study found that school staff in the PBIS*plus* group showed improvements in their ratings of efficacy compared with those in the SWPBIS group. According to the authors, this finding suggests that school staff felt more efficacious in handling behavioural concerns after being exposed to the PBIS*plus* intervention, which specifically targeted their skills in addressing students at risk for additional behavioural and academic challenges. Moreover, the staff in PBIS*plus* schools provided more consistent ratings of academic emphasis and student and parent involvement across time, which suggests a potential trend for intervention effects on both academic emphasis and student and parent involvement. The analyses of student outcomes revealed that students in PBIS*plus* schools were less likely to receive classroom-based behavioural services or support, and that teachers also rated these students as showing improvements in achievement over time in comparison with students in SWPBIS schools.

However, the study was not able to determine which particular elements of the PBIS*plus* model accounted for the improvements in staff and student outcomes. The authors therefore conclude that additional research is needed on PBIS*plus* in order to determine which elements or combinations of components are most impactful. They stress that all the participating schools were implementing the universal SWPBIS programme, and thus that the only element tested was the additional training and support provided to schools related to tier-two interventions. It may therefore be difficult to discern school-wide impacts, when these tier-two intervention activities are really intended to benefit only a small subset of students. This might explain why the effects of the present study are relatively modest. In

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other words, even though not all students were exposed to – or perhaps needed – the PBIS-*plus* support, a school-wide effect was explored because the random assignment occurred at the school level. Unfortunately, the study is unable to track which individual students in the PBIS*plus* schools received the tier-two support, and therefore the authors conclude that additional research is needed to examine whether the PBIS*plus* effects are stronger for subgroups of students, that is, for at-risk students.

Although it was anticipated that schools in the PBIS*plus* group would experience greater gains than the comparison schools, the results obtained in this study demonstrate **significant improvements in the measures of the implementation quality of support in all participating schools. According to the authors, these findings not only indicate a trend of improvement across all participating schools, but also suggest high levels of sustainability of SWPBIS among all schools.**

The article by **Cane & Oland (2015)** covers a UK national project, Targeting Mental Health in Schools (TaMHS), which seeks to offer support to schools in providing timely interventions and evidence-based approaches to help children and young people with mental health problems and those at risk of developing them.

The study has a cross-sectional design, with four UK schools participating in its implementation. The schools consisted of one primary and one secondary mainstream school, and one primary and one secondary special school. Within each school, all staff who had been involved with TaMHS were invited to participate.

The TaHMS project is guided by systemic models of working and uses whole-school approaches. Its model of delivery as evaluated for this paper had evolved, through a process of evaluation, from 2009 to 2013. The local TaMHS steering group involved partners from health, education and voluntary sectors. The project was managed by two educational psychologists from the local authorities or municipalities. Two elements formed the "core" aspects of the TaMHS model:

- Access for parents and young people in community settings (such as doctors' surgeries) to problem-solving sessions of up to 45 minutes with either a clinical or educational psychologist
- Schools were required to submit an "expression of interest" form, outlining their current provision for meeting children and youth's emotional needs

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In schools that agreed to participate, a senior staff member was required to attend a one-day conference focusing on raising awareness of mental health issues, and two other staff members to attend "Friends for Life" training, an approach using cognitive behavioural therapy to address anxiety and depression and to build emotional resilience. In addition to the core aspects, opt-in training was also offered to participating schools in areas such as eating disorders and self-harm. These were delivered using existing services via the TaMHS steering group. Targeted support was also offered through discrete school-based projects, led by various voluntary and statutory providers. Targeted support for children and young people focused on building resilience and fostering protective behaviours, while specific training for teachers was called "Incredible Years Classroom Management Training." In addition, the "Positive Parenting Programme" ("Triple P") was also delivered in schools to parents. To access these discrete targeted interventions, schools were required to create an action plan to demonstrate how they would continue to support the identified children and young people at the end of the project. All the schools involved described having clear and distinct roles for mental health promotion and had a nominated TaMHS coordinator, usually a member of the school-leadership team such as the deputy head or special educational needs coordinator.

The four schools participated in opt-in training sessions on subjects related to mental health in schools, such as divorce and separation or protective behaviours. Physical and electronic resources were used at three schools, including books, worksheets, and the school intranet/sharing systems.

The study shows that the importance of whole-school staff awareness training was emphasised by all four schools. The schools also highlighted the importance to other staff members of cascading training (training given to individual staff members who in turn provide the same training to others), but only two schools had the existing mechanisms to achieve this.

The staff perception was that there was a positive effect on outcomes for children and young people, including behavioural outcomes, pupil confidence, empowerment and independence, and social and emotional outcomes. Against this background, the authors conclude that there are strong grounds for working with promoting the mental health of pupils in schools.

All four schools perceived an improvement in staff attitudes and the school ethos. The authors consider these results to be connected to the fact that the wellbeing of students was seen as a whole-school responsibility. **The schools also reported that this was a consequence of whole-school staff training and gaining a common awareness and understanding. The**

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schools also reported on the importance of cascading training, but acknowledged that this is difficult to do in practice.

The study also covers aspects of support system attitudes and perceptions that will be covered under separate themes.

3.3.2 Summary of the professional development theme
A few key points across the nine studies included under the theme **professional development** can now be summarised as follows. Professional development should be:

- Intensive and targeted
- Continuous, and preferably spread over time
- With a focus on feedback on teachers' practice in the classroom
- With a focus on guidance and support
- Directed at whole-school staff awareness and training
- With a focus on encouraging collaboration in teams
- Supported by video
- With a focus on using data sources to assess and enhance students' learning
- Tailored to meet local context and policy

3.4 Theme three: support systems
The third theme is support systems, and includes studies whose primary focus is on different types of support for implementation practices. Theoretical and practical aspects of this have been covered by Humphrey et al. (2016) and Nelson & O'Beirne (2014) in chapter 2.

The theme is covered in detail by seven studies (Barker, 2011; Becker et al., 2013; Berger et al., 2014; Bradshaw & Pas, 2011; Cane & Oland, 2015; Collins et al., 2014; Wolpert et al., 2013), all focusing on the implementation of a school-wide programme. The first study is on early identifications and support to students with special needs. The next is on using teams to promote instruction and behaviour practices. The remaining five studies consist of on behaviour interventions and three on universal mental health in schools. The studies are presented in Table 3.4 below.

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Table 3.4.: Table illustrating studies within the theme support systems

Study	Country	Program/ practice	Target	Design
Barker (2011)	USA	Response to intervention (RtI^2)	School-wide	Qualitative comparative
Berger et al (2014)	USA	Instructional Consultation Teams (instruction and behavior practices)	School-wide	RCT
Bradshaw & Pas (2011)	USA	Positive Behavioral Interventions and Supports (PBIS)	School-wide	Cross-sectional study
Becker (2013)	USA	PAX Good Behavior Game (PAX GBG)	School-wide	Quantitative pre-post design
Collins et al (2014)	Scotland	Cognitive-behaviour therapy (universal mental health)	School-wide	RCT
Wolpert et al (2013)	UK	Targeting Mental Health in Schools (TaMHS)	School-wide	Mixed Methods
Cane & Oland (2015)	UK	Targeting Mental Health in Schools (TaMHS)	School-wide	Cross-sectional study

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The results are supplemented by findings in two other studies, which focus on other issues than support systems. These (Bishop et al., 2012; Quint et al. 2015) are described in detail under other themes.

3.4.1 The role of support systems

The PhD project by **Barker (2011)** is a qualitative comparative study examining key components of the implementation of RtI[2] (an extension of the original Response to Intervention (RtI) framework, using a data-driven problem-solving model to identify specific student needs) at two elementary schools in a county of southern California.

The study investigates the contribution of the following three areas to successful implementation of RtI[2]: (1) leadership attributes, skills, and practices; (2) professional development practices; and (3) new roles for general education teachers, special education teachers, and support staff (for a more thorough description of the study see theme one).

One of the study's conclusions is that professional development practices that encourage collaboration through teams allow teachers and support staff to focus on student achievement and create opportunities to share experiences of instructional practice.

The new and expanding roles and responsibilities for all staff members continue to be redefined and changed over the course of the RtI[2] implementation. For many teachers in the study, their roles expanded to include individual or small-group instruction, collaboration with other staff members, monitoring progress, collecting data, analysing data, and modifying instruction. The new roles required a change in how both teachers and support staff conducted assessment and intervention practices for struggling students, as well as students with disabilities. These changes in roles and responsibilities for teachers and support staff are very different from what was required in the past.

The final conclusion is that staff members' **new roles and responsibilities as existing resources undergo a redistribution in order to provide support for the implementation of RtI[2]. Resources including staffing and release time must be made available or adjusted both for initial and for continuous implementation of RtI[2]. Because roles and responsibilities of staff members changed with the implementation of RtI[2], release time for professional development or collaboration is crucial.**

The study by **Berger et al. (2014)** was part of an experimental research project evaluating the impact of a school-level problem-solving team model entitled instructional consultation

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teams (IC teams) on student and teacher outcomes conducted as a partnership between university researchers and school-district personnel. The implementation of IC teams was measured in terms of teacher utilisation in seventeen schools located in a suburban school district in a mid-Atlantic state in the United States. These schools received extensive training and ongoing support to implement the programme for four years from 2005/6 to 2008/9.

The IC teams model is a problem-solving intervention model promoting the use of evidence-based instructional and behavioural practices. It is a school-level intervention that requires systemic change, extensive professional development, and external support. It is directed at improving teaching practices and student outcomes as well as addressing teachers' belief systems and practices. When implementing the IC teams model, each school has a team leader and trainer (referred to in the study as the IC teams facilitator). The facilitator trains and recruits team members, promotes the programme among school personnel, takes on record-keeping duties, and works directly with teachers as a case manager. IC teams are interdisciplinary and often include general educators, administrators, specialists, and special educators. Team members serve as case managers, working individually with teachers who have requested support. In addition to one-to-one support, the IC team serves multiple purposes: it assigns team members to individual cases, monitors case progress, assists with problem-solving on specific cases, provides continuing professional development to team members, addresses school-level problems, and takes part in evaluation activities.

As part of the implementation of IC teams, extensive professional development efforts take place at schools during multiple years in order to train facilitators, principals, and IC team members. In the current study, this training was provided to schools in three phases over a three-year period. The first phase of training was implemented during the 2005/2006 school year: facilitators and principals, together with one team member from each school, were trained. This training included introductory training as well as seven monthly skills sessions (including practice assignments) and coaching by more experienced facilitators. In the second phase of training, completed during the second year, full teams from each received introductory training and training in consultation skills and processes. In the third phase of training, during the third year, facilitators, principals and team members were provided with technical support training, whose focus was on assisting them to integrate IC teams into existing school structures and to align resources.

After three full years of implementation, programme records indicated that at least 70 per cent of schools in the sample had met the criterion of having 67 per cent of teachers in their school utilise the IC team according to programme prevalence rates. Teachers' self-reported

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data suggested that 82 per cent of schools had met this goal by the second full year of implementation, and that all schools had reached the goal by the final year. There was substantial variation in utilisation rates across schools, ranging from 32 per cent to 93 per cent according to programme records and from 67 per cent to 100 per cent according to teacher self-reporting. The annual prevalence rate was more variable, rising in seven schools, falling in five, and mixed in five more. Despite these differences, most schools showed a jump in utilisation rate by the second year and a levelling and more gradual increase over the remaining years.

It must be noted however that high teacher attrition rates (personnel turnover) added complexity to the picture and probably influenced the results, because teachers who might have used the programme but then left the school would be missing from the data. However, the overall picture seems to be one of solid progress for some IC teams after three years.

The pattern for teachers' self-reported membership of IC teams showed a 16 per cent reported membership rate during the baseline year, rising to 23 per cent in the second year, remaining high and then slowly increasing to 28 per cent by the final year. The percentage of teachers approaching an IC team for help with a pupil with academic difficulties increased from 39 per cent during the first year to 60 per cent by the fourth year. Similar patterns were observed for requests for help with behavioural difficulties.

A positive relationship between utilisation rate and facilitator stability was found across both measures of utilisation. In only eight of the seventeen participating schools did the same facilitator remain in place over the three years of the study, and a few schools had a different facilitator in each year. The case illustrations provided some insights as to the role of the facilitator and the skills required to perform it. Overall, **it was demonstrated that facilitators need to be active, effective, and skilled in the intervention, should have the confidence of the staff, and should be able to cooperate well with the school principal.**

The support of the principal was hypothesised to be of importance to the effectiveness of facilitators and IC teams. Study data suggested that principals taking an active role at the beginning of the implementation process were associated with a higher percentage of teachers using the team. There were no significant relationships between principal attendance at team meetings and utilisation in the first year, and principal attendance at meetings and serving as a case manager in the following year were negatively associated with teacher utilisation. No apparent patterns were observed between administrator personnel stability and teacher utilisation of IC teams. There was a significant relationship between the principal taking a case in the second year of the study and facilitator stability, although this relationship was

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not replicated in the third year of the study. There were no significant associations between principal attendance at meetings and facilitator stability.

One of the major findings of the study was that high levels of teacher turnover limited the impact of the programme. Over two years, one-third of the general education teachers working in the schools at the time the project began had left, and by the fourth year, this number was at 48 per cent. The authors conclude that high turnover rates can potentially impede interventions that rely on training and personnel development, making the goal of obtaining school-level effects and extensive culture change hard to reach. It is speculated that **IC teams and similar programmes directed at the practices or attitudes of teachers may have a lower chance of successful implementation in schools with high teacher turnover. These in turn may be the schools that most need an improvement in teacher practices.**

The purpose of the study by **Bradshaw & Pas (2011)** is twofold: (1) to describe the process by which the state of Maryland scaled up a school-wide prevention model called Positive Behavioural Interventions and Support (PBIS), which aims to improve school climate and student behaviour; and (2) to evaluate contextual factors at the school and district levels that are associated with training, adoption, and implementation.

An increased adoption of prevention models at the district and state levels can be seen in most school settings across states in the United States. These scale-up efforts require considerable coordination and resources to ensure high-quality programme implementation across multiple schools. Several models for widespread programme dissemination and implementation have been proposed; however, there are few published empirical examples of the application of these models to the successful implementation of statewide prevention efforts. Bradshaw and Pas argue that further information is needed on how to develop the systems in school settings so as to support their implementation.

The implementation of PBIS is built upon the public health model of three-tiered prevention. Attention is focused on creating and sustaining primary (school-wide), secondary (targeted/small group), and tertiary (individual) systems of support that improve the outcomes for all children by reducing problem behaviours and making schools more effective, efficient, and more positive work environments for both students and staff.

Each district in Maryland is required to have some type of district-level PBIS coordinator who provides local leadership for the PBIS effort, participates on the PBIS state leadership

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team, and coordinates local and state PBIS training events.

The study is a cross-sectional study with multilevel analyses. Data came from a statewide evaluation of school-wide PBIS, collected during the 2006/7 and 2007/8 school years. For the initial PBIS training analyses, 810 traditional elementary schools across 23 districts in the state were eligible for inclusion. In this particular study seventeen districts (i.e. clusters) were included in the adoption and implementation analyses. All the traditional elementary schools in these seventeen districts (764 schools) were included in the adoption analyses. An examination of adoption among the trained schools only was also undertaken, including the subset of 298 trained schools across the seventeen districts. Lastly, the 227 schools (76 per cent of the trained sample) in the seventeen districts that submitted implementation were included in the implementation analyses.

The implementation of PBIS in Maryland comprises four phases. Phase one is creating readiness, by holding a conference to carefully review state data on school safety and to review and discuss different prevention models that might be a good fit for the state's priorities and resources. Phase two is the initial implementation. The Maryland PBIS initiative has developed a relatively extensive multilevel infrastructure or "support system" to promote dissemination of the PBIS model. The consortium includes various stakeholders (educators, practitioners, researchers, policymakers) who jointly coordinate, train, and support schools and districts in the implementation of school-wide PBIS.

All 24 Maryland school districts collaborate with the state to provide the initial two-day summer PBIS training, annual one- or two-day regional booster training sessions, and ongoing support for schools and implementation coaches. Much of the state- and district-coordinated training occurs for a core set of PBIS team members (typically four to six members attend the training events, including an administrator). It is a requirement in Maryland that each school has a building-specific coach, who, together with the district leadership, provides technical assistance, aids in problem-solving, and maintains momentum and enthusiasm for the programme within the school. It is advantageous if the coach is a local expert and has prior experience with the programme. **The role of coach was originally conceptualised as someone external to the school (so that school psychologists or counsellors might coach a school they were not otherwise assigned to), although this external model proved difficult to sustain when districts went to scale. Most PBIS schools now have internal coaches. Some districts have written PBIS coaching responsibilities into the school psychologists' job descriptions.** The coaches and core members of the PBIS team attending the district and state training events then lead the training of the other school staff back at the school. This

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training model, whereby the core PBIS team trains the rest of the school staff, is one element of PBIS that has facilitated the state's ability to rapidly scale the model.

Phase three is institutionalisation, and here the implementation of PBIS was initially financed, managed, and led by the state team, including funding, coordination, and staffing by the Maryland State Department of Education and in-kind staffing, coordination, and evaluation support provided by Sheppard Pratt Health System. Johns Hopkins University became a partner in 2001 and has provided in-kind training, coordination, and evaluation support. The national PBIS technical assistance centre also provided funding for a full-time staff member to help coordinate the PBIS Maryland initiative. However, as the initiative expanded to include more than half the schools in the state, it was no longer feasible to maintain centralised leadership for the effort at state level; the 24 local school districts therefore took on considerably greater responsibility for sustaining previously trained schools, while the state-level team focused on expansion to new schools and to more advanced tiers. This type of multilevel leadership and coordination structure is considered a key component of scaling-up efforts. Thus approximately three to five years into the Maryland initiative, there was an intentional shift towards creating greater capacity, coordination, and resource allocation at the district level. **Each district is now required to have some type of district-level PBIS coordinator, although there is considerable variation in the amount of full-time effort that this person specifically dedicates to PBIS.** The coordinator provides local leadership for the PBIS effort, participates on the PBIS state leadership team, and coordinates local and state PBIS training events. Many of the districts now have their own PBIS leadership team, a budget for PBIS, and other resources allocated for local support of the initiative.

Phase four was an ongoing evolution and renewal. A critical element of the PBIS Maryland initiative was developing and maintaining a comprehensive data system to monitor and evaluate PBIS statewide. There has been a focus on monitoring both implementation fidelity and student and staff outcomes. The National PBIS Technical Assistance Center and other researchers have created a series of validated, research-based measures of PBIS fidelity which are freely available for use by schools, districts, and states.

The conclusion of the study was that the model appeared to be effective, as evidenced by the high concentration – over half – of schools trained in PBIS throughout the state. **It is important to note, however, that the process was not linear. There were often times when the collaboration looped back to an earlier stage to integrate with emerging concerns, programmes, and priorities. Similarly, the evaluation and monitoring activities were ongoing, and played an important role in all phases of the implementation process.** As

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hypothesised, schools with greater need were more likely to receive training. Specifically, higher rates of suspensions as well as mobility were positively associated with training, while a higher rate of academic achievement was inversely associated with training. According to the authors, this suggests that the lower-performing schools were more likely than other schools to access PBIS.

It is important to note that schools in Maryland self-identify for PBIS training, and thus it appears that many of the lower-performing schools were seeking training as a way of improving the school. At the district level, the number of schools (or district size) was inversely related with training, such that schools within larger districts were less likely to be trained. The finding that training and adoption were associated with district-level predictors is consistent with literature suggesting that the district has the most influence in determining the involvement of schools in a particular initiative.

As hypothesised, the number of years since a school had first received training in PBIS was positively associated with implementation, as measured by all three IPI scales. Similarly, **the concentration of qualified teachers also predicted implementation quality, suggesting that the better prepared and coached the teachers, the more effective the programme implementation. It is also stressed that support given by practising school psychologists and other professionals within the school should be ongoing, since implementation takes time.**

The study by **Becker et al. (2013)** explores the association between a two-phase coaching model and the implementation of the PAX Good Behaviour Game (PAX GBG) by elementary school teachers in a large urban school district. The two main goals of the paper are (1) to examine how coaches tailor their practices according to teacher implementation quality, and (2) whether coaching is associated with improved implementation quality.

The PAX Good Behaviour Game functions as a group-based token economy in which groups are rewarded for their collective success in preventing aggressive/disruptive and of-task behaviours. In addition, verbal and visual cues are used to promote attentive and prosocial behaviours and a positive classroom environment. The implementation of the PAX Good Behaviour Game unfolds over the course of an entire academic year of 31 weeks. In connection with this process, a two-phase coaching model is employed to support teacher implementation. This model includes a one-day training workshop, followed by two phases of coaching: a universal coaching phase lasting four to six weeks, in which coaches use the same strategies with all teachers, and a tailored coaching phase, during which coaches apply

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an adaptive approach tailored to fit the needs of individual teachers. Ongoing coaching efforts take place throughout the implementation period, with intensity and content varying after phase one according to the needs of each teacher. Coaching is carried out by three former school teachers, who are employed by the research team and given intensive training and supervision.

The authors use quantitative measurements based on three data sources: coach logs, teacher logs, and observations of teacher implementation quality. Observations are completed by independent observers using the PAX Good Behaviour Game implementation rubric at four time-points spaced over the academic year. The implementation rubric includes items on seven dimensions reflecting core components of the intervention, including preparation of students, choice of activity, and use of timer, and observers rate teachers on each dimension using a five-point scale. These ratings are then averaged in order to build a mean implementation rating score for each teacher. Rubric scores for the autumn semester (round one) serve as an initial measure of implementation quality, while final rubric scores occurring in May (round four) are used as an outcome variable reflecting teacher implementation proficiency following coaching. Additionally, rubric scores are used to categorise teachers into two groups: low-quality and high-quality implementers.

Overall, study findings suggest that **the two-phase coaching model is associated with improved implementation quality of the PAX Good Behaviour Game. This association highlights the importance of coaching as a support system for securing implementation quality.** Out of a total of 129 participating teachers, 55 per cent were categorised as high-quality implementers based on round-one rubric scores, while 45 per cent were categorised as low-quality implementers. As round-one scores were from a time-point at which teachers had received only one to two days of training and about a month of coaching, this suggests that models like the PAX one can be implemented with good quality by many teachers after a relatively modest level of training and coaching.

Furthermore, results show that round-four implementation scores were significantly higher than round-one scores, meaning that teacher implementation quality improved over the course of the year. Low-quality implementers showed the greatest improvements, but did not reach the same rubric scores in round four as teachers who started out as high-quality implementers. This is taken to indicate that **assessments of teacher implementation made early in the process are to an extent predictive of future implementation quality, and can therefore be useful in determining which teachers are in need of additional support.**

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A study by Collins et al. (2014) evaluates the effects of a universal mental health promotion intervention delivered to nine-to-ten-year-olds attending Scottish primary schools. Here the focus was on determining whether anxiety and coping showed improvement following the intervention, whether there was a significant difference between groups led by school psychologists and groups led by teachers who had received prior training and support, and whether any differences were sustained beyond the immediate end of the intervention.

The intervention was based on cognitive behavioural therapy (CBT) intended to develop coping skills. It provided practice in coping skills, with lessons designed to help children recognise their own emotional symptoms, reduce their reliance on avoidance strategies, and focus on proactive means of problem-solving and support-seeking. Children assigned to intervention groups received the intervention content instead of their regular "Personal and Social Education (PSE)" sessions. Comparison group participants attended regular PSE sessions with their teachers.

All teachers and school psychologists in charge of training the intervention-group children receive professional development in the form of a training day for a locally developed manualised mental health programme taught by school psychologists. Participants are provided with an overview of CBT and introduced to the concept of coping, the principles of risk, and the promotion of good mental health, as well as being given lesson content for the ten-lesson intervention programme, together with a detailed manual. A further training session is carried out with all class teachers in order to support the completion of evaluation measures.

The authors utilise a mixed-design intervention of three-by-three involving three groups (school psychologist-led intervention, teacher-led intervention, and comparison) and three time periods (pre-intervention, post-intervention, and six-month follow-up). Allocation of children to intervention or comparison groups is random. Effects are measured pre-intervention and immediately post-intervention (within three weeks of intervention end), with follow-up measurements six months after intervention end. Two psychometric instruments were used to assess the children's progress in managing their anxiety and in their development of coping skills:

- The coping strategy indicator (CSI), which measures three factors: social support-seeking, problem-solving, and avoidance
- The Spence children's anxiety scale (SCAS), a self-reporting scale used for children to measure anxiety

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In addition, data are examined to identify the number of children scoring in the clinically defined range of anxiety, and children are divided into two groups, "at risk" and "healthy." Frequencies of risk status are measured for each group over time with the aim of looking for differences in risk trajectories between teacher-led, school psychologist-led, and comparison groups.

Results of the study show significantly reduced levels of self-reported anxiety in intervention groups post-treatment, with no observed changes in the comparison groups. Furthermore, the use of coping skills based on avoidance was reduced and levels of problem-solving coping skills were increased for the intervention group compared to the comparison group, with intervention effects still present at six-month follow-up. Finally, children labelled "at risk" assigned to intervention groups were more likely than their peers in the comparison group to move from the "at risk" to the "healthy" category.

No differences were revealed between teacher-led and school-psychologist-led groups on any measures at post-intervention or at follow-up, with the exception that coping skills other than those based on avoidance at follow-up appeared to favour the teacher-led groups These findings are seen by the authors as having important implications for intervention sustainability. The suggestion is that **teachers receiving the appropriate training from school psychologists can effectively deliver a mental health programme within the school curriculum, not only at a lower cost than psychologists but also without intensive demands on personnel and time, thus increasing the likelihood of program sustainability.** It is suggested that the finding in favour of the teacher-led group may be due to teachers having an advantage over psychologists as they deliver universal programmes in school. One possible explanation is that teachers are more likely to be aware of specific events in children's lives and are therefore better able to connect their guidance to meaningful situations. In addition, **teachers may be able to continue working with children's coping skills and specific stressors even after the intervention has formally ended**, something that is not possible for psychologists, who leave their classes as soon as the programme is finalised.

In 2008, a research group was commissioned by the British government's education department to carry out a national evaluation of the TaMHS initiative (see section 3.3.1). This research project, described by **Wolpert et al. (2013)**, had a mixed-methods design incorporating a longitudinal observational study, a randomised controlled trial, an interview study of TaMHS stakeholders, and in-depth case-studies of various implementation sites.

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Launched in 2008, TaMHS was a large-scale, nationwide initiative designed to embed targeted mental health support in schools across England. The goal was to develop local models for providing early intervention and targeted support for children aged five to thirteen at who were at risk of developing or already experiencing mental health problems.

The TaMHS initiative involved schools in every local authority or municipality across England, with total funding reaching £60 million nationally over a period of three years. Funding from TaMHS was available for local authorities and for schools, who were free to choose how to best use the funds to meet their needs. Thus local authorities and schools could choose between investing in training, support and consultancy for school staff, additional frontline practitioners to work with staff and pupils, voluntary-sector provision, and associated management activity.

In addition, support and guidance materials for schools were developed reflecting two guiding principles: (1) that the selection of interventions must be informed by the evidence regarding what works in school-based mental health provision, and (2) that the programme should support strategic integration across agencies involved in the delivery of Child and Adolescent Mental Health Services (CAMHS). While these two principles were mandated at the national level, the overall emphasis in TaMHS was on local implementation and on tailoring support to fit local needs. This meant that each local authority developed its own project in cooperation with colleagues in primary care trusts and in the voluntary sector, in order to support a number of schools in the area through the provision of evidence-based targeted mental health support.

The implementation of the programme, its impact on student mental health outcomes, and stakeholder experiences with the programme were evaluated using quantitative and qualitative methodologies. A randomised controlled trial study involving 8,658 eight- to ten-year-olds and 6,583 11- to 13-year-olds, a three-year longitudinal study involving 3,346 eight- to ten-year-olds and 2,647 11- to 13-year-olds, and qualitative interviews with 26 TaMHS workers, 31 school staff, fifteen parents, and 60 students were used. Student mental health was assessed primarily through student self-reporting supplemented by teacher and parent informant-report surveys. Schools also completed annual school coordinator questionnaires designed to examine the nature and range of approaches to mental health provision implemented through TaMHS.

Turning to the evaluation results, schools reported providing a range of approaches including child-focused support, parent-focused support, and staff-focused support. They reported

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implementing various different combinations of these approaches to varying degrees throughout the project. Across all schools, mental health support was generally provided by teachers and other internal staff; a smaller proportion made use of external professionals, but this varied as a function of time, phase of education, and difficulties. In terms of staff training, the number of schools that reported interventions being led by staff with no mental health training decreased over time, and the reported use of trained staff increased.

In the initial stages, both primary and secondary schools used locally developed approaches more often than nationally or internationally tested strategies. Hence the authors describe how the norm was practice-based evidence (PBE) rather than evidence-based practice (EBP). In primary schools there was an increase in the use of evidence-based practice approaches over time along with a decrease in the use of practice-based evidence strategies. However, the converse was true in secondary schools.

In general, no schools reported using approaches that involved following a rigorous protocol or manual. The most frequently used category was work based on a plan but open to adaptation. This is taken by the authors to indicate that the optimal delivery for school-based mental health provision is a strategy that balances prescriptiveness with flexibility. The links between schools and specialist health provision were also explored, revealing that schools implementing TaMHS made use of positive links with specialist mental health services more often than those that were not implementing TaMHS.

In terms of stakeholder experience, staff, students, and parents were all positive about the experience of embedding mental health in schools. Those involved in the implementation of TaMHS found that one of the fundamental challenges to implementation involved addressing the differences in philosophy and working practice between agencies. They also found that this challenge was exacerbated by the lack of, and need for, a common language between schools and Child and Adolescent Mental Health Services. **Factors that facilitated successful implementation included integration of all mental health support activities into the school setting, building on previous initiatives, and being sensitive to the existing context in terms of understanding what had already worked, what issues needed addressing, and what current ways of working looked like.** School staff members were generally enthusiastic about TaMHS and gave examples of positive changes. **Key facilitating factors mentioned by staff included having specialist mental health workers based on site in schools.**

Surveys of parents revealed that they regarded schools as the key point of contact for concerns about mental health issues, and regarded teachers as the primary group to turn to when

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worried about their child's mental health. Parents were generally positive about TaMHS and stressed the importance of good communication in working with schools on mental health issues. In the annual survey of student experiences, most students responded that they had access to mental health support in schools. Students also showed an awareness of a range of approaches available in their schools and an appreciation of the ways these could be helpful.

Turning to the impact of TaMHS on student mental health outcomes, the randomised controlled trial demonstrated that the implementation of TaMHS led to a reduction in behaviour problems, but not emotional problems, for eight- to ten-year-olds. No impact was found for eleven- to thirteen-year-olds. The effects on behaviour problems in TaMHS primary schools were enhanced by the provision of evidence-based self-help materials, but not by other area-level support. For primary schools, the longitudinal study revealed decreases in both emotional and behavioural difficulties (as assessed in student and teacher surveys) over the three years of evaluation. The secondary school picture, however, was more mixed, with student reports revealing a decrease in emotional, but not behavioural difficulties, while according to teacher reports there was no change in either. In terms of the factors associated with changes in student mental health over time, school reports giving information to secondary school students was positively related to improvements in the mental health of children with behavioural difficulties. In primary schools, however, this same provision was associated with a smaller rather than a larger reduction in emotional problems. In terms of inter-agency working, school reports of both the use of a shared inter-agency assessment framework, the Common Assessment Framework, and good links with specialist health-based Child and Adolescent Mental Health Services were positively associated with improvements over time in secondary school children's behavioural problems.

The authors suspect that the reason why TaMHS was apparently more effective in tackling behavioural as opposed to emotional difficulties may be the greater awareness of and priority given to externalising difficulties in schools. The findings indicating that the impact of TaMHS was more pronounced in children of primary school age is taken to reinforce calls for earlier intervention efforts, in order to address mental health difficulties before they become set and thus less responsive to treatment. However, it is possible that the contrasting systemic and relational contexts of primary and secondary schools may also have influenced the effects found. The fact that reports of good links with specialist mental health services proved to be positively associated with alleviation of behavioural difficulties among secondary school students over time leads authors to suggest that establishing closer links between specialist CAMHS and schools should continue to be a policy priority.

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In closing, the national evaluation of TaMHS provided a mixed picture of the success of this model. On the one hand, some of the findings were very positive and showed an impact on children's mental health outcomes. Several analyses, however, showed no results, suggesting that there are several areas for improvement and refinement. According to the authors, one possible issue here is the dilemma of evidence-based practice versus practice-based evidence. Although the evaluation demonstrated an increase in the use of evidence-based practices throughout the project in primary schools, on the whole, the authors claim that **schools did not engage with this issue as fully as was hoped for a range of reasons, most likely to do with questions of awareness and access to evidence.**

The work by **Cane & Oland (2015)** covers a UK national project, Targeting Mental Health in Schools (TaMHS), which seeks to offer support to schools in providing timely interventions and evidence-based approaches to help children and young people with mental health problems and those at risk of developing them. For a further description of the intervention see theme two (section 3.3.1).

All four schools in the study indicated that the project leader is a key facilitating factor in the success of implementing TaMHS. **A strong commitment from the school senior leadership team was found to result in better implementation. Schools should therefore appoint a project leadership team with clear role expectations and make sure to gain the support of the school-leadership team.** In general the schools reported positive experiences when collaborating with the outside agencies involved in implementing the interventions.

The teachers involved in the project also consider parental involvement important. Three of the four schools involved mention that this was hard to enlist. Two schools suggest that further parent training could be a solution to the problem.

The results also indicate that **resources (including electronic resources) that usefully support the implementation of TaMHS include policies and documents, effective communication mechanisms, and language use in school.**

3.4.2 Results from the two supplementary studies
In the study by **Bishop et al. (2012)**, professional development for teachers was conducted on site by in-school facilitators, who were provided with professional learning opportunities by a university-based research and development team. The authors found that **teachers must be supported if they are to gain awareness of the inherent potential of the teacher–student relationship.**

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Quint et al. (2015) describe the use of coaches and facilitators working with school staff to implement the reading intervention Success For All (SFA). The results indicate that the **commitment of the coaches and the school principal are directly connected to the success of the implementation process.** Documented in the results is that schools that did not have full-time committed SFA coaches, or used the coaches for other functions, had a lower average on the implementation score.

3.4.3 Summary of the theme support systems
Key points across the ten studies included under the theme support systems can be summarised as follows. Support systems should:

- Promote fidelity
- Support in both preparation and undertaking of implementation processes
- Be accessible and ongoing before, during, and after implementation
- Be active, effective, and improve skills in the programme or activity
- Be able to cooperate with the school principal
- Have the confidence of the staff
- Function as IC team using a problem-solving approach
- Support with coaching

3.5 Theme four: fidelity
The fourth theme is *fidelity*, and this includes studies focusing primarily on implementation adherence. Theoretical and practical aspects of this have been covered by Humphrey et al. (2016) in chapter two.

Eleven studies are included in the theme (Caven et al., 2012, Clarke et al., 2014; Coffee & Kratochwill, 2013; Cross et al., 2015; de Kock & Harskamp, 2014; Korkeamaki & Dreher, 2010; Mayer, 2012; Sørlie & Ogden, 2015; Sørlie et al., 2015; Wilson & Tanner-Smith, 2013; Woodbridge et al., 2014). All but two of these focus on the implementation of school-wide programmes. The first study reports an experiment on expanding learning time so as to improve academic and non-academic outcomes. The next three studies cover academic programmes, two cover literacy, and one covers problem-solving in mathematics. The following five studies are behavioural programmes, followed by one on universal mental health in schools and, finally, one focusing on reducing school dropout. The studies are presented in Table 3.5 below.

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Table 3.5: Table illustrating studies within the theme fidelity

Study	Country	Program/practice	Target	Design
Caven et al (2012)	USA	Expanding learning time	School-wide	Quasi-experimental
Mayer (2012)	USA	Leveled Literacy Intervention (reading and writing skills)	Small groups (3-4 students)	One group pre-post test
Korkemaki & Dreher (2011)	Finland	Implementation of new core curriculum (literacy)	Class level	Case study
de Kock & Harskamp (2014)	Netherlands	Word Problem Solving (meta cognitive computer program for math)	School-wide	Quasi-experimental
Cross et al (2015)	USA	The Rochester Resilience Project (behavioral and social-emotional problems)	School-wide	RCT
Sørlie & Ogden (2015)	Norway	N-PALS (problem behavior)	School-wide	Quasi-experimental
Sørlie et al (2015)	Norway	Preventing Problem Behavior in School	School-wide	Quasi-experimental
Woodbridge et al (2014)	USA	First Step to Succes (behavior program)	School-wide	RCT
Coffee & Kratochwill (2013)	USA	Parise intervention (behavioral consultation)	School-wide	RCT
Clarke et al (2014)	USA	Zippy's Frinds (mental health in school)	School-wide	RCT
Wilson & Tanner-Smith (2013)	Not applicable (systematic review)	Intervention programs for increasing school completion or reducing school dropout	Primary and secondary school students	Systematic review

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The results are supplemented by findings in three other studies whose main focus is on other issues than support systems. These studies (Andreassen & Bråten, 2011; Festas et al., 2015; Lynch et al., 2012) are described in detail under other themes.

3.5.1 The role of fidelity

In a quasi-experimental study by **Caven et al. (2012)** of three schools in Massachusetts, learning time was extended. The study examines the effect of the extra time on schools, teachers, and students over three and four years of implementation. Participating schools were required to expand learning time by at least 300 hours per academic year, with the aim of improving student outcomes in core academic subjects, broadening enrichment opportunities, and improving instruction by adding more planning and professional development time for teachers. Schools were able to draw upon state resources as well as technical assistance and support from Massachusetts 2020 and Focus on Results to implement expanded learning time in their schools. Participating schools received an additional $1,300 per student to lengthen the day and/or year.

The effects were studied using qualitative ethnographic field studies of classroom activities, individual interviews with school administrators and teachers, and focus-group interviews with students. Results were also assessed quantitatively by means of teacher and student surveys on attitudes to and perceptions of school, including relationships with teachers and participation in extracurricular activities. These data were supplemented by data from administrative public registers on student-level achievement in reading/English language, mathematics, and science exams as well as student-level characteristics (such as special education status). The data also contains information from the end-of-year student information management system files (such as student-level demographic variables and behaviour variables, including attendance rates, truancy rates, in-school suspension rates, and out-of-school suspension rates).

The study shows that the three participating schools allocated their expanded learning time with differing degrees of fidelity. Across the schools, use of time, approaches to academic support and enrichment, and engagement of community partners varied considerably.

All three schools worked with the Massachusetts Expanded Learning Time (ELT) implementation index. The Expanded Learning Time index worked as a guide for both implementation and evaluation of implementation. The index focuses on the following factors: school-wide academic focus, support, and instructional practice; enrichment activities; teacher leadership and collaboration; school leadership; and stakeholder satisfaction. **Higher implementing**

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schools showed significantly greater effects on students' academic and social outcomes than in low implementing schools after both three and four years of implementation.

High levels of student engagement were observed in classrooms where teachers had carefully planned and executed lessons. Additionally, in those classrooms where students were more engaged, there appeared to be positive relationships between students and teachers. Students did not appear to be more engaged in one subject within or across schools or one type of class. Nor was student engagement sensitive to time of day. At all three schools, students articulated that enrichment classes were fun and enabled them to build connections to the school and staff.

The effect of extended-learning time was significantly positive in science and maths. A significantly higher proportion of teachers in the extended-learning schools reported that the length of the school day allowed them to accomplish their teaching goals and cover the amount of instructional material their students need to learn than might be expected in the absence of longer learning time. A significantly higher proportion of teachers in extended-learning schools reported that they were satisfied with the amount of time available for instruction in English language, mathematics, and science than expected in the absence of longer time. At all three schools, observers noticed evidence that teachers throughout the school were using data to inform instruction. At one of the schools, a bulletin board in the principal's office depicted each student's achievement test results over time. Students, each represented by a post-it note, advanced from red to yellow to green as their scores on recurring assessments improved.

The PhD thesis by **Mayer (2012)** examined the impact of implementation adherence monitoring and group feedback procedures when teachers implemented the Levelled Literacy Intervention (LLI) among first- and third-grade pupils. The study investigated changes in implementation adherence levels as teachers participated in problem-solving feedback sessions. Pre- and post-surveys were also employed to examine changes in teacher perceptions of implementation monitoring and feedback procedures, as well as the relationship between various background variables (e.g. previous teaching experience using LLI teaching) and implementation adherence levels. This was a literacy intervention for a small group of students (typically three to four students) who were below grade-level in early reading and writing skills. The overall goal of the intervention was to bring pupils up to grade-level within 14 to 18 weeks. Each thirty-minute intervention session was systematic and sequenced, including explicit instruction using a variety of levelled books and other materials for teaching word structure and sound.

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Fifteen teachers from seven elementary schools in a district in the south-eastern United States agreed to participate in the study, after attending an introductory meeting at their school. All teachers had 34 school days to implement LLI, and it was recommended that they hold four to five sessions per week. In this period there were three feedback sessions, separated by two to three weeks. An introductory meeting took place before these sessions. The procedure was conducted in the autumn of 2010 with one teacher group, and in the spring 2011 with two teacher groups. Each teacher group comprised four to six teachers.

The research design was quantitative, and involved repeated measures. The implementation adherence level was measured by a checklist of implementation adherence to LLI. The author developed this checklist because no such adherence monitoring tool had previously been developed, and its validity was ensured by expert feedback.

The implementation adherence checklist was completed by teacher self-reports, the primary researcher, and two research assistants. The fifteen teachers completed an implementation adherence checklist after every LLI session they conducted. Between one and two sessions were video-recorded every week, and a total of 88 usable videos were analysed. The researcher viewed all video records while completing the implementation adherence checklist. The two research assistants viewed approximately 30 per cent of the videos while completing the implementation adherence checklist. Overall, agreement between the teachers' self-reports and the video-recording (researcher/ research assistant) was good. The agreement between researcher and research assistant was excellent.

During group feedback sessions, the primary researcher presented implementation adherence data to the teachers. In other words, she presented the group's average implementation levels and per cent agreement between the self-reporting checklists and the researcher-completed checklists. In the group feedback sessions, teachers also had the opportunity to share common barriers that interfered with implementing the intervention and to share recommendations for overcoming those barriers. After each session teachers received a written summary of their shared recommendations.

The study did not demonstrate a significant functional relationship between group feedback sessions and implementation adherence levels. However, teachers generally maintained high-implementation adherence levels throughout the study. In other studies, by contrast, implementation adherence often appears high in the beginning of the implementation and then declines. **It is likely that the self-reporting checklists, video observations, and group feedback sessions were influential in maintaining implementation adherence in this study.**

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Other factors were also assessed that might have affected implementation adherence. These included previous training and experience, current LLI responsibility, and primary teaching assignment. **The only factor that had significant effect on LLI implementation adherence was the number of previous LLI student groups taught. Teachers who had taught more student groups had higher implementation adherence levels.**

The author noted that the recommended intervention frequency was not followed. Four to five LLI sessions had been recommended conducted four to five times a week, but only two teachers followed this frequency rate, and other teachers had a lower frequency rate. Teachers held between 16 and 31 intervention sessions during the LLI period. Teachers often indicated reasons why the intervention was cancelled, and common reasons given were often related to school planning, for example for end-of-grade testing, teacher workshops, field trips, or teacher meetings. The author indicated that it was difficult to coordinate scheduling of LLI groups with the classroom teachers' schedules, and that time for daily uninterrupted LLI teaching was a challenge.

Perceptions about LLI monitoring and feedback procedures and understanding of essential steps were also assessed in pre- and post-ratings. A pre-feedback session survey was completed by teachers at the introductory meeting before teachers experienced involvement with LLI adherence monitoring and feedback procedures. A post-feedback session survey was completed at the end of the last feedback session. The findings indicated that **after participating in these, teachers had positive perceptions of implementation monitoring and feedback methods.** Teachers also reported significantly greater understanding of the essential LLI steps in post-ratings than pre-ratings. The author noted that it was very possible that the sample of teachers in the study were more committed to implementing LLI and more open to having their own behaviour assessed and discussed than the average teacher, as they had agreed to participate in the study after attending an introductory meeting of LLI. Thus it was important to be aware of this particular sample of teachers when considering the results.

The aim of the study by **Korkeamaki & Dreher (2011)** was to determine what kind of literacy instruction took place in grades one and two in one Finnish school, and to find out how the teachers were able to interpret the core curriculum and implement it into their classrooms.

In 2004 the Finnish National Board of Education introduced a new curriculum framework that aimed to make students active participants in their own learning. Accordingly, the

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learning environment was to encourage students' curiosity, interest, and motivation. Moreover, the learning environment was to promote students' abilities to interpret, question, and formulate arguments. These abilities were of particular importance because research showed that Finland's students were not particularly strong in these areas.

The study focused specifically on the core curriculum of the subject "mother tongue and literature." This curriculum reflected the visions outlined above and involved a list of content to be included. It provided guiding principles (for instance,. that students' interaction skills should improve), then more specific objectives (for instance, that pupils should "become accustomed to interactive situations at school"). The list of content was neither detailed nor complete, reflecting one of the characteristics of the Finnish school system, that it is based on trust that teachers will interpret the curriculum to fit their own classroom context. The Finnish core curriculum is in fact one of the least prescriptive curricula among European countries. The teachers were to structure the content according to the context and level of students' learning. Finnish research suggested that this curricular approach, although interesting, was demanding, as well as challenging for teachers.

The study is a case-study of one Finnish school in 2006, two years after the implementation of the core curriculum. Twelve teachers from first- and second-grade literature classes were observed during a two-month period. Classroom observations were conducted by groups of between two and four pre-service teachers as part of their literature course. A total of 44 pre-service observations were involved. Multiple observers allowed for cross-checking of the observations. In addition, the findings were also presented to the teachers who had been observed so as to validate the data.

The qualitative data was analysed by comparing, first, the observed behaviour of the teachers and, second, the principles of the core curriculum of mother tongue and literature. The results revealed that teacher practice in the classroom did not correspond fully with the requirements of the core curriculum. The authors distinguished between shortcomings in the teachers' teaching style and shortcomings in the content of the lesson. Many areas of content were covered, including language awareness and students' reading. However, there was no observation of students spending time sharing their reading with peers or teachers, and no observation of creative writing. These activities were all specific objectives outlined in the core curriculum.

Most teachers followed a traditional teaching style of "teacher-led instruction": for instance, a teacher asked a question and the student replied. Thus teachers followed a rigid structure

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which left little time for reflective discussion, which was the intention of the core curriculum. The classroom teachers did not promote the students' ability to interpret, question, or develop argument, and there was no observation of spontaneous shifts in the structure of the class to cater for student interest or motivation. The teachers often followed prescribed activities such as textbooks which had teacher guides on how to work with the text. This however had not been the intention of the core curriculum.

The authors of the study have not addressed how the school as a whole worked with the core curriculum to make teachers aware of the requirements during the two years. Thus it is unclear how the process of implementation of the core curriculum was unfolding in the school. **The authors assume that the lack of fidelity between the core curriculum and the teachers' behaviour was due to the fact that the core curriculum was demanding and challenging for teachers.** They describe how teachers were positive towards the curriculum. However, the core curriculum provides only principles and objectives, and this requires not only considerable content and pedagogical knowledge, but also a significant commitment of time among teachers.

The authors conclude that the intangible nature of the Finnish core curriculum was challenging. They therefore suggested giving teachers more specific training or guidelines. However, providing more tangible guidelines can run counter to the idea of creative and interpretive teaching. Overall, the authors argued that the fact that **the core curriculum was intangible and non-prescriptive hindered the implementation process.**

The aim of the study by **de Kock & Harskamp (2014)** was to investigate whether students' performance and ability in specific mathematics tasks could be improved by an evidence-based intervention, a metacognitive computer programme. The metacognitive computer programme assisted students in Word Problem Solving (WPS) in mathematics classes by providing specific hints. WPS are mathematics problems in written form: for instance, "Peter has eight apples and buys five more. How many apples does Peter have now?" In the computer programme, students could choose hints when they did not know how to continue their solution process in WPS. The steps of hints were presented with a visual representation of the main features of the mathematics problem, without giving away the answer.

A quasi-experimental design was carried out on eighteen grade-five classes in twelve middle-sized elementary schools in the Netherlands which were assigned either to the experimental or the control condition. In total, eighteen teachers and 390 students took part. Twelve

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teachers and their 280 students were assigned the experimental condition, and six teachers and 110 students the control condition.

The experimental condition involved teachers implementing the metacognitive computer programme in their mathematics classes, while the control condition involved using the usual mathematics textbook. Teachers in both control and experimental condition participated in workshops preparing them for (respectively) using the usual mathematics textbook for assisting students in WPS or using the metacognitive computer programme. Thus measures were taken to encourage both groups to believe that they were part of an evidence-based intervention. Moreover, both groups were given the same evidence-based information about WPS. However, teachers in the experimental group had to use the metacognitive computer programme to support the students in their process of problem-solving, but the control group had to use the mathematics textbook. In the workshops, both groups were given time to plan their ten-week implementation period, so that their new knowledge and the computer programme were integrated in the mathematics curriculum that fitted their schedule.

In the experimental condition, students were given a pre-trial in the programme before the ten-week implementation period started. During the ten weeks, they worked with the computer programme for twenty minutes each week. Teachers were instructed to check the students' performance every week, and they were instructed to give feedback to students who failed to use hints or did not manage to solve particular word problem tasks. To check if the teachers tracked their students sufficiently, teachers had to fill in a logbook every week. In the control condition, teachers followed the mathematics textbook and used training materials with word problem samples. Teachers organised four to five mathematics lessons of 45–50 minutes each on the topic during the ten-week period.

Overall results (multivariate multilevel analysis) showed that students assigned to the metacognitive computer programme significantly outperformed the control group in solving and analysing word problems. They also scored significantly higher on self-monitoring, a metacognitive ability necessary for WPS in mathematics. These results controlled for differences in the pre-test scores of the two groups. Analysis of students' computer log files during the ten weeks showed that students in the experimental condition maintained their performance in solving problems correctly during this time.

The computer programme gave students immediate standardised hints or metacognitive prompts relevant for WPS. In the control condition, students received hints or prompts when the teacher had the time. Moreover, the results of teacher self-reported questionnaires

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showed that the six teachers in the control condition used the instruction in WPS they had received only sparsely, and that their use of it did not increase over the ten-week period. It thus appeared that students in the control condition received inadequate training in WPS compared to the experimental condition. In other words, the study indicated that a metacognitive computer programme guided by a teacher is more effective in providing immediate and relevant WPS feedback than a typical teaching setting in which one teacher caters for all students.

The authors highlighted that the results of this study, in which teachers had implemented, organised and supervised the intervention, were less strong than previous studies (controlled experiments) with the same computer programme in which researchers had implemented, organised, and supervised the intervention.

The results of the students' computer log files indicated that students were given enough time to work with the computer programme on a regular basis. Moreover, the log files indicated that teachers were capable of organising their timetable and combining their daily tuition with the computer programme. In other words, the implementation appeared to be well managed in terms of planning and incorporating it in the mathematics curriculum.

From the teachers' logbooks it was clear that teachers in the experimental group did not use the computer programme to the maximum. They did not, for example, use the computer data to analyse which individual students could improve their problem-solving techniques. Moreover, teachers gave students hardly any individual feedback, nor did they help them improve their hint usage. The authors recommended that teachers should in future be trained in the specific skills mentioned above to improve the implementation of the metacognitive computer programme.

The results of the study indicate that **success in both the experimental and the control condition were somewhat compromised because teachers in both conditions did not adequately follow the instructions given. The authors indicate that teachers' fidelity to the instructions of the implementation has a significant impact on enhanced student learning.**

The study by **Cross et al. (2015)** was conducted in order to address gaps in fidelity measurement and to contribute to understanding the relationship between fidelity and outcomes in the context of a randomised trial of a school-based preventive intervention delivered by paraprofessionals. Two aims are presented in the study: first, to develop reliable observational

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fidelity measures of implementer adherence and competence and to examine the relationship between them; and second, to conduct an initial test of the criterion-related validity of these measures by using them to predict improvements in child behaviour after one year of the two-year intervention. The Rochester Resilience Project is a school-based preventive intervention designed to strengthen self-regulation of emotion among first- to third-graders with elevated aggressive–disruptive behaviours.

The researchers developed the Rochester Resilience Project to address the needs of young children with emerging behavioural and social/emotional problems, by providing an accessible school-based intervention. In the context of a relationship with an intervention mentor over four months, children learn and practise behavioural and cognitive skills designed to strengthen their self-regulation of emotions, in addition to addressing specific goals to improve school adaptation.

In total, ten implementers and 76 mentored children participated in the study. The sample was recruited through the Rochester Resilience Project, and 76 of the 203 mentored students from that project were selected for the study. The following criteria were used: (1) grade, gender and baseline TOCA scores to reflect the total child sample, and (2) equal number of dyads coded across the duration of the trial per implementer.

Six outcome measures were examined, and a shortened version of the Teacher Observation of Classroom Adaptation – Revised was applied. For statistical analyses, intra-class correlation, exploratory factor analysis, multilevel modelling (SAS mixed), structural equation models, comparative fit index, and the Tucker–Lewis index, standard Wald-type were applied. The six outcome measures from the randomised controlled trial were examined at the end of the first intervention year. An authority acceptance measure was completed both before a child's random assignment to condition (baseline) and six months after the intervention was initiated in order to measure proximal outcomes.

The intervention had three targets: child and parent components for selected children, and a universal classroom component. This study focused solely on implementer fidelity, delivering the individual child component of the intervention. The research team trained teachers to screen children for programme eligibility. Resilience mentors received training and a manual to guide their delivery of lessons (Cross and Wyman 2004). Mentors were trained to calibrate the level of support required by each child over time, and to use reinforcement and feedback to successfully transfer skills to the children. The mentors also collaborated with teachers to identify classroom situations in which children could be reminded to use

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the new skills they were taught, although teachers were not trained to coach children in the use of the new skills. The implementers participated in extensive training (approximately 200 hours). All implementers were employed full time with the study for at least one year, although three out of ten implementers were not retained for all four years of the trial. The implementers or mentors had previously been employed as school-based paraprofessionals (such as school aides) in other schools. Researchers and programme developers (who in this research project were the same people) supported the intervention.

The Rochester Resilience Project found significant impacts on-task orientation (effect size: 0.33), behaviour control (effect size: 0.31), assertiveness/withdrawal (effect size: 0.37), and peer social skills (effect size: 0.47), compared with the control condition. Children in the intervention group also showed significant decreases in frequency of referrals and suspensions when compared with controls. An examination of the impact of the intervention by gender revealed that girls experienced a significant increase in peer social skills (effect size: 0.90), while social skills did not improve in boys.

A primary finding of the study is that rigorously developed implementer fidelity measures of adherence and competence were associated with enhanced outcomes at the end of the first intervention year. This finding demonstrated the measures' criterion-related validity. As expected by the authors, higher adherence and competence scores were associated with lower levels of child-reported externalising behaviours, and also with lower parent-reported conduct problems. Higher adherence was also associated with lower internalising and behavioural dysfunction per parent report. That is, there were clear variations in how well implementers delivered the intervention, and higher fidelity was associated with more positive proximal outcomes reported by children and parents. Neither measure of fidelity was related to proximal child outcomes on the teacher measure of aggressive–disruptive behaviour.

The study shows that the implementer accounted for the greatest amount of variance in the scores on each of the measures. The researchers found that the implementers were less adherent with a different lesson that focused on engaging the child in learning and practising labelling feelings using a "charades" type of game. It appears that **the implementers' familiarity with the general game of charades may have interfered with carrying out the activities as prescribed. In other words, implementers "stuck to what they knew" about charades and missed several important content points and activities as a result.**
The study also shows how **information about implementation fidelity can be used to inform and enhance training.** Based on the multilevel analyses, the researchers also found that, for

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girls, implementer fidelity varied in terms of higher adherence but not of competence. That is, the implementers delivered more of the manualised content to girls, but were equally competent in their delivery (i.e., emotionally responsive, used active learning strategies, and tailored activities) with boys and girls. Another way to view this finding is that implementers went "off manual" more with boys than with girls, and had lower adherence.

The study by **Sørlie & Ogden (2015)** is the first effectiveness study in Europe of the three-level US intervention, School-Wide Positive Behaviour Support (SWPBS). The primary purpose of the study was to examine the effectiveness of the N-PALS model on student problem behaviour and on the learning climate in class in Norway.

N-PALS is a culturally adapted version of the United States-based SWPBS, implemented in a large proportion of Norwegian primary schools in an effort to reduce student problem behaviour. The N-PALS model aims primarily to prevent and reduce behaviour problems and to promote positive student behaviour. There are three key elements in the intervention. The first involves enhancing positive behaviour support, so that school staff teach clearly defined rules and acknowledge prosocial behaviour; the second is a school-wide approach such that there is consistency in the communication of common expectations and rules both within the school and across family and school; and the third involves monitoring student behaviour. It is estimated that the N-PALS model takes three to five years to fully implement.

N-PALS schools selected a school team (four teachers, the principal, a school psychologist, and a parent representative) responsible for the N-PALS implementation at their school. The teams had to plan, inform, carry out, monitor, and report on the interventions and outcomes at their school. The school team also trained the rest of the staff in key features and intervention components for two hours per month, and spent about two hours per week on implementation activities. To support their work, the teams received local training and supervision from a certified N-PALS coach for a period of two years (ten two-hour training sessions per year). Additionally, the teams attended four half-day regional network meetings per school year. The core components of the model were described in a handbook, but it was also adapted to the local context in each school.

The study used a quasi-experimental research design, whereby 28 primary schools implemented N-PALS and twenty schools involved regular practice. The sample was stratified and matched. The data was collected from more than 1,200 teachers and 7,640 students at

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four measurement points during four successive school years. Questionnaires were used to measure problem behaviour in the schools' common areas, the learning climate in class, and implementation quality. School organisational characteristics (such as school size) were also included in the study.

The authors concluded that the N-PALS model was effective in reducing problem behaviour. The prevalence of problem behaviour occurring in the common area was significantly reduced during the study period, and the results indicated a significant effect of N-PALS on problem behaviour across time. This effect was true both for serious behaviour problems (e.g. physical attacks on teachers) and moderate behaviour problems (e.g. running in corridors). The prevalence of problem behaviour within the classroom context was substantially reduced in both groups during the study period, but no significant effect of the intervention appeared. The quality of the psychosocial learning conditions in both experimental and control schools improved during the implementation period (as rated by school staff). However, a significantly greater improvement was reported in the intervention condition than in the control condition, indicating a positive effect of N-PALS. The number of students fully or partly educated in segregated settings due to problem behaviour declined by 37.5 per cent from baseline to post-test in the N-PALS schools, while the number increased by 54 per cent in the control schools.

The results showed that **schools with high-implementation quality benefited the most from the intervention.** Moreover, **school size was inversely related to implementation quality: thus fidelity implementation was greater in smaller schools than in larger schools. Schools with the lowest proportion of untrained staff were high-implementation schools.**

The study by **Sørlie et al. (2015)** examined the effects of the universal Preventing Problem Behaviour in School (PPBS) intervention in Norwegian primary schools.

The PPBS intervention was developed and piloted in Norway as an abbreviated version of the SWPBS developed in the United States. The key features of the PPBS intervention were (1) a school-wide approach and differentiated evidence-based practices, (2) systematic positive reinforcement of expected prosocial behaviour, (3) corrections (mild consequences) following problem behaviour, (4) good directions, and (5) the establishment of a functional support system. The PPBS included a 30-hour in-service training programme lasting four full days. The entire school staff was included in the programme training (i.e. the principal, teachers, assistants, special education teachers, social workers, after-school personnel, and

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representatives of the school's psychological service). The standardised training sessions were led by the programme developers and were composed of a combination of lectures, demonstrations, training, coaching, and homework. An intervention manual and all the training materials could be downloaded from the internet. The intervention was free of charge for the school.

The research design was a quasi-experiment. Seventeen Norwegian primary schools (grades one to seven) implemented PPBS while twenty control schools engaged in "practice as usual." The participants were not blind to which research condition they had been allocated. Questionnaires were used to measure the following:

- Student problem behaviour inside and outside the classroom (rated by school staff)
- Classroom climate (rated by students and staff)
- Collective efficacy and self-efficacy in schools (staff-rated); this involved how competent staff felt they were in managing and preventing problem behaviour and in promoting academic skills
- Behaviour management (rated by staff and students); this involved students and staff rating how well staff were using strategies to promote prosocial behaviour and how well they were managing problem behaviour
- Implementation quality (rated by staff)
- PPBS training dosage (refers to the intervention school's mean training attendance score)

Data was collected in three waves. Time-point one (T1, baseline, staff only) was at the end of the school year prior to the implementation of the PPBS. Time-point two (T2) was six months later, at the beginning of a new school year and close to the initiation of the intervention. Time-point three (T3, post-test) was at the end of the school year and four months after the programme training.

The authors concluded that PPBS schools compared to control schools reported substantial reductions in negative behaviour incidents occurring outside the classroom context (e.g. corridors, playgrounds etc.) compared with the control schools four months after programme training. This result was based on staff ratings. Intervention impacts were evident both for less severe problem behaviours (e.g. unrest while waiting, rude comments to teachers) and for more severe problem behaviours (e.g. theft, physical attacks). No main effect of the PPBS was observed for the quality of the classroom climate as rated by staff or students. The authors concluded that there was a significant improvement in school staff behaviour management following the PPBS (as rated by school staff reports) featuring increased use

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of behaviour-supporting practices such as giving praise, acknowledgement, and proactive instructions. The authors do not mention whether students also rated staff behaviour management as improving following PPBS. During the study period there was an increase in perceived self-efficacy in the PPBS schools compared to control schools. Thus staff had greater confidence in their mutual ability to support student learning and prevent problem behaviour.

Results also indicated that the following factors promoted implementation: first, small-to-medium schools; second, training dosage; third, high-implementation quality; and four, qualification of teachers. Small-to-medium schools benefited more than larger schools from reduced problem behaviour in common school areas, better classroom climate, and higher perceived collective efficacy. It should be noted that a "large" primary school in Norway is a school with 300 children or more. **Intervention schools with high-implementation quality showed greater improvements in classroom climate and positive behaviour supports associated with PPBS than did schools with low fidelity scores.** PPBS schools with a high mean training dosage demonstrated a significantly greater reduction in student problem behaviour than schools with a low dosage. The staff's use of positive discipline was significantly greater in PPBS schools with a high proportion of unqualified teachers than in those schools with lower proportions. Overall, **the schools with the highest implementation scores and highest proportion of unqualified staff appeared to benefit most from the intervention.**

The purpose of the study by **Woodbridge et al. (2014)** is twofold, namely to examine whether effects of the First Step to Success programme are maintained at follow-up one year post-intervention, and to examine the relationships between implementation fidelity and student outcomes.

First Step to Success is a manualised intervention for students in grades one to three who have moderate to severe behaviour problems. The programme is a secondary prevention intervention (implemented when children do not respond to primary, school-wide universal prevention strategies) consisting of three modular components: universal screening, classroom intervention, and parent training. The screening component is used to identify students who meet eligibility criteria for programme participation, while the classroom intervention and parent training comprise the programme intervention component. Students participate in thirty programme days, while the entire programme lasts approximately three months. The classroom intervention component is usually implemented over a period of ten to twelve weeks and requires a trained behavioural coach working with the classroom teacher to learn

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and apply techniques and strategies for eliciting and supporting the target student's positive behaviours. Typically the behavioural coach is a school counsellor, school psychologist, behaviour specialist, or social worker. In the classroom, the coach provides feedback and monitors the student's behaviour using visual cues and tallies points for positive behaviour during timed intervals. Each programme day has performance criteria that must be met before proceeding to the next programme day. The coach implements the initial five programme days, after which the classroom teacher takes over implementation of the programme, with daily supervision and support from the coach. After ten programme days, the student's home setting becomes involved. Researchers from the First Step development team at Oregon Research Institute (ORI) train behaviour coaches and teachers in the intervention protocol and in monitoring and supporting implementation fidelity (e.g. by providing consultation to participating teachers), and the coaches are in close contact with ORI supervisory staff. Coaches are also scheduled to regularly undergo fidelity monitoring checks to review their adherence to the First Step implementation protocol.

A total of 34 schools participated in the study, of which data were collected from 202 general education teachers and 202 first- to third-grade students and their parents. Teachers were randomly assigned to intervention or comparison groups, within two cohorts. Teachers in the comparison group continued to use their typical instructional and classroom management techniques. The ORI researchers collected outcome data for intervention and comparison students at baseline, immediately on completion of First Step (post-test), and at one year after First Step completion (follow-up). However, because by the time the follow-up measures were collected the students had advanced to a new grade, a different teacher completed these assessments than had completed the pre-test and post-test measures.

ORI researchers were also responsible for assessing the implementation fidelity of the intervention. They used the implementation fidelity checklist to document the extent to which the coach and teacher delivered First Step components as intended and with high quality. They observed the implementer in the classroom three times: once for the coach and three times for the teacher. The implementer was rated on eighteen components (e.g., whether the implementer announced the number of points needed for a reward, elicited cooperation from classroom peers, provided positive feedback, or used verbal reminders to prompt the student). For each component, observers rated implementation adherence and quality. A classroom fidelity score was calculated as the average quality score across the eighteen components and four observations.

The results showed that the overall classroom fidelity ratings were within an acceptable

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range (i.e., between okay and good on a five-point scale). In their assessment of whether First Step students whose intervention was implemented with higher fidelity (i.e., adherence and quality) achieved better outcomes then students whose intervention was delivered with lower fidelity, the authors find that the only statistically significant effect was a negative relationship between implementation fidelity and students' academic engaged time (AET) from post-test to follow-up. Academic engaged time is an indicator of students' academic involvement and adjustment to classroom expectations. It is based on external direct observations of student behaviour, unlike the other behavioural outcome measures used in the study (i.e., second-party reports of students' behaviour).

The findings regarding relationships between implementation fidelity and effects at follow-up indicate that students who experienced First Step implemented with higher fidelity also had significantly greater erosion from post-test to follow-up in intervention benefits in terms of academic engagement than students who experienced First Step implemented with lower fidelity. According to the authors, a possible explanation for this finding is that **students who experienced higher implementation fidelity also experienced the greatest contrast between the intervention classroom and the more typical classroom that they entered the following year.** The disruption from one year to the next in what First Step students had come to expect in the way of teacher responses to positive and negative behaviour and classroom management practices might have prompted students to revert to prior patterns of poor academic engagement. Accordingly, students who experienced lower fidelity may also have experienced less contrast between the implementation-year and second-year classrooms, and this might have prompted a relatively less steep decline in behaviour.

In conclusion, the study suggests **the importance of working with the teachers of target students in the year after implementation, both in order to reduce the probability of worsening behaviour problems and to support the enduring effects of the intervention.**

The purpose of the study by **Coffee & Kratochwill (2013)** was to examine teachers' implementation and generalisation of a praise intervention throughout a problem-solving behavioural consultation process with students who were identified as having similar challenging behaviours to other students in the classroom who were not identified as exhibiting challenging behaviours.

According to the authors, key goals of behavioural consultation are positive intervention outcomes and the prevention of future problems. In schools, behavioural consultation pro-

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vides a means for teachers to learn strategies for dealing with presenting problems. When teachers generalise the skills they learn during consultation to other students, behavioural consultation can be conceptualised as a form of prevention. That is, the teacher will develop and apply a set of skills that can be used to address similar issues with other students and to prevent the occurrence of classroom problems. However, before generalisation in be-havioural consultation can occur, implementation of the intervention must first occur, and this essentially requires a change in teacher behaviour. Therefore, in order to determine whether the consultation process has preventive outcomes, the study sets out to explore whether teachers apply the skills learned during consultation to non-target students or to the entire classroom.

The study is a randomised multiple baseline experiment, involving four teachers and fifteen of their first- to third-grade students (three to four per teacher) from two elementary schools within one school district. Of the participating students, one student in each classroom was randomly assigned as the consultation target student. Throughout the consultation process, the *consultation target student* was the primary focus of consultation. A second student in each classroom was randomly assigned as the *generalisation target student*. The remaining participating students in each classroom were assigned as the *non-target students*. Teachers were randomly assigned to one of four baselines, with randomly selected intervention star-ting points. The intervention lasted approximately ten weeks, and data were collected across four phases/conditions: baseline, intervention implementation, generalisation prompt, and generalisation training. Trained graduate students in school psychology and the primary researcher (the first author) conducted observations of teacher and student behaviours during instruction to determine the extent to which teachers applied the skills developed during behavioural consultation to the target student and to other students. Observations were conducted approximately five times per week and lasted fifteen minutes, for a total of approximately 33 observation periods per classroom. In addition to observations, data measuring student outcomes, treatment integrity, the consultation process, and teachers' perceptions of the process was collected.

As a part of the praise intervention, teachers participated in school-based behavioural con-sultation and learned how to implement verbal praise statements in accordance with the following guidelines: (a) name the student who is to be praised; (b) use a range of praise words; (c) specifically describe the behaviour warranting praise; (d) use a genuine tone to increase credibility; (e) praise most students in private (depending on the student's preference); (f) deliver individualised praise; and (g) attribute student success to effort, persistence, and ability. Next, teachers were asked to implement the praise intervention with the consulta-

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tion target student. Later, teachers were prompted to generalise the praise intervention to students with behavioural difficulties similar to the consultation target student (a generalisation target student and non-target students). Finally, teachers engaged in generalisation training. The study's primary researcher (the first author) served as the consultant during the entire intervention.

Specifically, the behavioural consultation model used in this study was organised around five stages: (1) establishing a consultant–consultee relationship; (2) problem identification; (3) problem analysis; (4) plan/treatment implementation; and (5) plan/treatment evaluation. A generalisation prompt and generalisation training occurred during the plan/treatment implementation stage.

The first stage of the consultation process facilitated an introduction to the consultation process. In addition it served the purpose of establishing a consultant–consultee relationship between each teacher and the consultant. During the second stage, each teacher and the consultant identified and defined the problem of concern for the consultation target student and identified the desired behaviour. Further, a goal in terms of the targeted behaviour was developed. The third stage aimed to examine the problem behaviour and contributing factors, and to establish an intervention plan. During this stage it was also established how the teacher would deliver praise statements (i.e., following guidelines on a treatment integrity checklist), as well as *when* (i.e., during a specified instructional period, after the occurrence of on-task behaviours) and *how often* (i.e., four or five times during a fifteen-minute period). During stage four, each teacher implemented the praise intervention following the aforementioned guidelines in order to enhance treatment adherence and integrity. Prior to implementation, the intervention had been role-played until each teacher understood how to implement the praise intervention and reported being competent and comfortable implementing it with integrity.

During implementation, each teacher measured the integrity with which she implemented the intervention by daily completing a treatment integrity checklist. However, given inconsistent implementation during the intervention implementation condition, a booster session was conducted. Next, the researchers replicated the generalisation sequence. That is, generalisation of the intervention to the generalisation target student and to non-target students was encouraged by means of a generalisation prompt and a generalisation training interview. The generalisation prompt occurred during a brief check-in with each teacher, approximately twenty days after the start of intervention implementation. Three to thirteen days after the generalisation prompt, each teacher and the consultant engaged in the more

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intensive generalisation intervention, a generalisation training interview in which programming tactics were incorporated. In the fifth and final stage of the consultation model, a treatment evaluation interview was conducted in order to provide each teacher and the consultant with the opportunity to evaluate the effectiveness of the intervention plan and to discuss whether the intervention plan resulted in improved outcomes for the consultation target student. During this stage, the available data from baseline through treatment implementation were examined, and the consultant debriefed each teacher on the purpose of the study and discussed any questions or concerns expressed by the teachers.

It was hypothesised that teachers would implement the intervention with the consultation target students, but might not naturally generalise the intervention used with the target students to the generalisation target students and the non-target students during the intervention implementation condition. Further, it was hypothesised that teachers would generalise the intervention to a greater degree during the generalisation training condition than during the generalisation prompt condition. The findings of the study suggest, however, that three out of four teachers delivered somewhat more praise to the consultation target students during the intervention implementation condition than during the baseline condition, but then declined. Following the generalisation prompt, praise was absent to minimal;, by contrast, following the generalisation training, praise visibly appeared consistent with the frequency observed during the intervention implementation condition.

However, **results also indicate that teachers did not put guidelines into practice, and therefore did not consistently implement or generalise the praise intervention as a result of the conditions of the consultation process. In other words, results indicate that the intervention implementation was low and inconsistent throughout the study.** Data also suggest overall satisfaction with the behaviour consultation process, even though two out of four teachers expressed concern regarding the amount of time required to participate in the consultation.

The results obtained in this study are mixed, in that they do not provide support for generalisation of the praise intervention to generalisation target students or non-target students during intervention implementation or following the generalisation prompt or generalisation training. Rather, the findings suggests that **differences in the implementation and generalisation may be a function of individual differences between teachers and/or contextual variables rather than a function of changes in condition** (i.e., intervention implementation, generalisation prompt, generalisation training). The authors therefore argue that behavioural consultation can be effective in producing changes in behaviours for some teachers.

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However, due to overall low levels of teacher praise behaviours, valid conclusions regarding student outcomes cannot be made.

In the study by **Clarke et al. (2014)** the immediate and long-term impacts of an emotional wellbeing programme are evaluated and the impact of implementation fidelity on intervention outcomes is assessed. The programme, entitled Zippy's Friends, is a universal school-based programme for children aged five to eight. It promotes mental health and emotional well-being by working with children's coping skills through a series of 24 sessions, implemented over one academic year. Sessions are divided into six modules, each containing four lessons conducted by classroom teachers. Modules are focused on a particular theme such as feelings, communication, and conflict resolution. In this particular study, the intervention is given to Irish first-grade students (aged seven or eight) attending disadvantaged primary schools, with the programme being incorporated into the Social, Personal and Health Education (SPHE) curriculum mandatory in Irish primary schools. Implementation of the programme is coordinated by the Health Promotion Service of the Health Service Executive in Ireland. A joint partnership between the Health Service Executive and the Department of Education and Skills is set up to prepare for programme implementation.

In order to assess the impact of Zippy's Friends and address the question of implementation fidelity, the authors use a clustered randomised controlled trial design, with schools being assigned to either intervention or control groups. Two intervention groups are formed, with one group asked to implement the programme faithfully, and one group asked to use the programme as a resource. This is done in order to determine the effectiveness of the programme when used as a resource in comparison to full programme implementation. Intervention-group teachers are provided with professional development in the form of a two-day training workshop taught by health promotion specialists, as well as ongoing support. Control group schools are given no directions and go on to implement the usual Social, Personal, and Health Education curriculum. In total, 766 Irish first-grade children from 44 schools are enrolled to participate in the study, with some attrition occurring over the course of the study due mainly to school and teacher factors (e.g. questionnaires not returned, schools no longer able to commit to the study) and children moving to other schools.

Intervention effects of the Zippy's Friends programme are assessed both immediately and in the longer term using a twelve-month follow-up measure. Two psychometric instruments are employed to measure children's outcomes pre-intervention, at immediate post-intervention, and at twelve-month follow-up:

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- The emotional literacy checklist, which is a questionnaire completed by teachers and measuring five dimensions of emotional literacy: self-awareness, self-regulation, motivation, empathy, and social skills
- The strengths and difficulties questionnaire, also completed by teachers, which is used to assess children's emotional and behavioural functioning, generating five subscale scores: emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems, and prosocial behaviour

In order to measure fidelity of implementation, teachers are asked to fill out checklists and questionnaires. These self-report items are complemented by observation questionnaires from structured class observations carried out by the first author and a health promotion specialist in a sample of classes over the course of the study.

Statistical analysis reveals a significant positive impact of Zippy's Friends on children's emotional literacy scores at immediate post-intervention, with effects maintained at twelve-month follow-up. Authors take this as indicative of the lasting effect of the programme, which may stem from the ability of programme materials to provide structure, consistency, and repetition in the delivery of emotional literacy skills content. It is noted that the positive intervention effects found are significant, but generally small. This indicates the possible existence of so-called "ceiling effects," an expression used to describe the fact that when universal programmes targeting all children (as opposed to at-risk children) are implemented, pre-intervention scores on emotional literacy may already be relatively high, thus limiting the potential for larger improvements.

No significant effects are found on children's emotional and behavioural problems. This is explained by the authors as possibly stemming from the fact that classroom management and dealing with behavioural problems are not explicitly addressed in the Zippy's Friends programme. Furthermore, the relatively short duration of the programme (in comparison with more extensive multi-year programmes) is suggested as an explanation, leading authors to conclude that a more integrated model implemented throughout primary school grades in combination with other strategies targeting the school and community levels may lead to better behavioural and emotional outcomes.

Finally, assessments of implementation fidelity indicate that high fidelity is directly related to improved emotional literacy scores at post-intervention, meaning that the higher the level of fidelity, the higher the emotional literacy score. In this way, study results are

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seen as underscoring the importance of high-implementation fidelity in gaining positive intervention outcomes. Fidelity is found to be high both for teachers asked to implement the programme faithfully and for those asked to use it as a resource, with no significant differences between these two groups, indicating an overall high level of teacher commitment and support for Zippy's Friends.

Further analysis of teacher questionnaires, observations, and focus-group sessions (as reported in the secondary study) offers additional insights into the implementation process and the factors promoting or hindering it. With regard to the programme itself, teachers reported that the content of the Zippy's Friends lessons and the use of child-centred activities strengthened the relevance of the programme to the children's daily lives. At the teacher level, the provision of training and ongoing professional support served as a factor promoting high-quality implementation of the programme. Also found to be facilitative was the involvement of teachers in the lessons, for example by sharing personal experiences with the children or by engaging in role play. This commitment shown by teachers was seen as a promoting factor for child participation. This effect was also found the other way around, in the sense that children's enjoyment and enthusiasm with regard to the programme was reported by teachers to have a promoting effect on their own motivation to teach the lessons. When asked about hindering factors, teachers most frequently reported lack of time during the day as a challenge to programme implementation. The time of implementation during the school year (the programme was commenced halfway through the academic year) and small classroom size were factors that were additionally perceived to have negative effects on child participation.

Teachers made several recommendations to strengthen future programme implementation efforts, including the addition of more hands-on and multimedia activities, the involvement of parents in the programme, and the creation of a more extensive programme lasting from junior infants to sixth class. Teachers perceived a once-off programme in primary school to be insufficient, underlining the importance of a comprehensive, whole-school approach where all teachers are trained to use programme strategies, both in and out of class.

Lastly, the contextual and environmental factors within which the programme was implemented were investigated through the use of teacher questionnaires concerned with themes such as school policies, positive mental health promotion throughout the school, and support from community services. Results from these questionnaires indicated that both intervention and control schools provided children with a positive school environment, and that teachers

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worked to provide for children's needs within the schools. However, three areas were found to be especially problematic for schools:

- The needs of staff were not reported as being a high priority, with most schools not having a policy on staff health or welfare. Staff members were unlikely to seek help when feeling stressed, and most teachers reported that no support was available to them
- Links with the wider school community were not reported to be well established, with low levels found with regard to collaboration with community agencies, for example
- Lastly, most teachers reported that parents were supportive of the school and its governance; but fewer told of parents' active involvement in school life, noting a lack of opportunities given to parents to participate and learn about the school's social, personal, and health curriculum

The authors take these results as indicative of a **lack of school support structures and wider community collaboration. They suggest that future interventions be implemented with attention paid both to specific programme components and to the broader school-wide context, underlining the importance of teacher training and support at both teacher and school level, so as to provide schools with the resources to work collaboratively with parents and the surrounding community.**

The purpose of the systematic review by **Wilson & Tanner-Smith (2013)** is to summarise the available evidence on the effects of prevention and intervention programmes for increasing school completion or reducing school dropout among primary and secondary students. The study focuses primarily on the comparative effectiveness of different programme strategies in an effort to identify the programmes with the largest effects on the respective school participation outcomes, especially with regard to differences associated with programme strategies, implementation quality, and programme location or setting. A final objective of the study is to explore evidence of differential effects for students with varying characteristics.

The authors have searched a wide range of electronic bibliographic databases such as the Australian Education Index, British Education Index, Canadian Education Index, Dissertation Abstracts International, Education Abstracts, ERIC, and PsycINFO in order to identify and locate qualifying studies reported between 1985 and 2010. Several other research registers and organisation websites, reference lists of all previous meta-analyses, and reviews on the topic were searched in an attempt to locate grey literature. Studies eligible for inclusion in the review were required to meet several eligibility criteria, such as research design and

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educational setting. The search yielded a total of 23,677 reports. Of those, 548 reports describing 167 different studies were included in the final review. (However, fifteen studies focused on programmes for pregnant or parenting teens and are reported elsewhere.) The remaining 152 eligible studies were coded on numerous variables related to study methods, the nature of the intervention and its dosage and implementation quality, the characteristics of the participant samples, the outcome variables and statistical findings, and contextual features. The authors used random-effects inverse variance weighted meta-analytic methods to synthesise odds ratios for the school dropout outcomes. Meta-regression models were used to examine the effects of programme characteristics, methodological characteristics, and participant characteristics on the dropout odds ratios.

Overall, the results of this systematic review showed that all types of dropout prevention and intervention programmes were effective, and that no programme type consistently outperformed others in that most programmes were equally effective. However, the authors also found that implementation quality was an important predictor of programme effect, in that higher implementation quality tended to be associated with larger programme effects. Specifically, the study showed that dropout prevention and intervention programmes that had difficulties with implementation fidelity tended to show smaller effects on dropout than programmes that indicated that no implementation complications were present or did not explicitly identify problems with implementation. According to the authors, possible reporting biases could be an explanation for this finding, in that researchers may generally be more likely to report complications with implementation of their programmes when programme effects are less successful than expected, while researchers who find significant treatment effects might spend less time reporting on fidelity. However, the authors also stress that they carefully reviewed any supplementary research reports available for the included studies that provided additional information related to implementation. Therefore they believe that finding implementation quality to be an important predictor of treatment effectiveness is not solely the result of researchers using implementation quality to explain small, non-significant, or negative programme effects.

According to the authors, nearly half of the reviewed studies (47 per cent) mentioned complications with implementation of the programme. While some studies simply stated that programmes experienced problems with implementation, others reported specific problems and difficulties related to staffing or funding, problems with administrator buy-in, or other structural difficulties in implementing the programme (e.g., computer access, lab space).

In conclusion, this systematic review suggests that **the particular programme strategy**

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chosen makes less of a difference in eventual outcome than selecting a strategy that can be implemented successfully by the school or agency. Therefore the authors conclude that focusing on **implementation quality is critical, and that decision-makers may be better off considering, for instance, the fit of a programme with their setting and staff than selecting a particular or popular strategy.**

3.5.2 Results from the three supplementary studies

In **Andreassen & Bråten (2011)**, the focus of the study is on the implementation of a framework called Explicit Reading Comprehension Instruction, which is based on four instructional principles/practices. The results from the observational data indicate that **two of the principles were poorly implemented and therefore had limited effect. The cause here is estimated to be that teachers had too little knowledge of the strategies in the intervention.**

Festas et al. (2015) examine the effect of writing performance on Portuguese students when implementing the US-originated Self-Regulated Strategy Development Instruction. The lesson fidelity was measured by a checklist. Observations found that 78 per cent of the activities prescribed were implemented with acceptable fidelity. This (relatively speaking) positive finding suggests that it is easier to **maintain a high level of fidelity when there are very clear guidelines for implementation of the intervention.**

The study by **Lynch et al. (2012)** looks at how a science curriculum was implemented and then scaled up in a large school system. Three different reform-based, guided inquiry science curriculum units were studied. Regarding fidelity, the authors provide an example of how implementation fidelity has a vital significance for the effects (or lack thereof) of a given intervention. When implementing one of the units, researchers were frustrated by poor and confusing results on student outcomes. They decided to replicate the trial in a different setting of schools, placing a strong emphasis on the fidelity of implementation. **With this extra care taken to optimise fidelity, the intervention showed positive results and was allowed to proceed to scale.**

3.5.3 Summary of the theme fidelity

Key points across the fourteen studies included under the theme fidelity can be summarised as follows. Fidelity can be promoted by:

- Fidelity checklists or implementation adherence checklists
- Using video observations
- Group feedback sessions

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- Making teachers aware of requirements
- Providing tangible guidelines
- Taking staff and school settings into consideration when choosing programme activities
- Supporting teachers
- Using collaboration practices

3.6 Theme five: attitudes and perceptions
The fifth theme, **attitudes and perceptions**, includes studies whose primary focus is on different attitudes and perceptions in regard to implementation. Theoretical and practical aspects of this have been covered in chapter two by Durlak & DuPre (2008), EC (2007), Goldacre (2013), and Tseng & Nutley (2014).

The theme is covered in detail by seven studies (Benjamin, 2011; Bishop et al., 2012; Cane & Oland, 2015; Crompton & Keane, 2012; Leadbeater et al., 2015; Lee, 2012; Roland, 2012). All but one of these focus on the implementation of a school-wide programme. The first two studies deal with identification and support for students with special needs. The next two studies cover academic programmes, the following two address behavioural programmes, and the last is on mental health in schools. The studies are presented in Table 3.6 below.

Table 3.6: Table illustrating studies within the theme attitudes and perceptions

Study	Country	Program/practice	Target	Design
Benjamin (2011)	USA	Response to Intervention (RtI)	Class-wide	Case study
Lee (2012)	USA	Response to Intervention (RtI)	School-wide	Cross sectional
Bishop et al (2012)	New Zealand	Effective Teaching Profile (ETP)	School-wide	Mixed methods
Crompton and Keane (2012)	USA	One to one IPod Touch Project	School-Wide	Case study
Leadbeater et al (2015)	Canada	WITS programme (Walk away, Ignore, Talk it out and Seek help - behavior)	School-wide	Longitudinal study: Cohort based study
Roland (2012)	Norway	The Respect Programme (reduce and prevent challenging behavior)	School-wide	Case study
Cane & Oland (2015)	UK	Targeting Mental Health in Schools (TaMHS)	School-wide	Cross sectional

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The results are supplemented by findings in two other studies that focus primarily on other issues than attitudes and perceptions. These studies (Festas et al., 2015; Mayer, 2012) are described in detail under other themes.

3.6.1 Impact of attitudes and perceptions

Benjamin's (2011) qualitative case-study investigated how elementary school teachers implemented Response to Intervention (RtI) in their general education classrooms in a southern state in the United States. The study participants represented varying backgrounds, degrees of education, experience, and grade levels. The participating school commenced RtI implementation in August 2008. The data collection for this study was carried out in May to July 2009.

The participants in the study indicated that RtI policy language (through the RtI manual) provided a foundation for knowledge and understanding. Teacher descriptions of RtI were consistent with the local education authority's definition and included language relative to policy goals, teacher tasks, and mandated policy activities. Yet all three teachers stated that the RtI policy language and implementation procedures were ambiguous and open to varying interpretations. Some participants had strong reactions to the ambiguity of the policy language and the lack of explicit procedures. They demonstrated concern about the precise understanding of the process and the specific steps for RtI implementation. In addition, the teachers identified the availability and consistency of RtI policy information as obstacles to understanding and implementation. In essence, RtI policy was neither readily available nor consistent, which made implementation difficult. Of particular importance is how the teachers dealt with policy ambiguity.

The results also indicate that teachers entered on the RtI implementation with differing personal attributes, including education, experience, and beliefs. The two less experienced teachers demonstrated anxiety, and described feeling overwhelmed, confused, and under-skilled due to a lack of technical knowledge regarding RtI implementation policies and procedures. The most experienced teacher indicated that RtI implementation seemed logical and rational given her prior knowledge and experience with similar processes. The experienced teacher expressed more confidence in her ability to implement RtI because she was able to assimilate new information into her existing knowledge base.

According to the teaching performance record data, the mid-career teacher and the teacher with the most experience demonstrated a lower degree of participation in RtI related activities; however, their student engagement scores were higher than the least experienced teacher in the study. The study results suggest that both the mid-career teacher and the most

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experienced teacher used their knowledge and experience to assimilate RtI implementation into existing classroom practices and schedules.

The least experienced teacher demonstrated a strong commitment to RtI implementation. She made many different accommodations to allow for instructional and behavioural interventions, support materials, and documentation. In contrast, the mid-career and veteran teacher exhibited a minimalist approach to RtI implementation. Thus the two more experienced teachers opted for less invasive methods of RtI implementation. Whenever possible, they incorporated teaching and administrative RtI tasks into existing classroom practices and schedules.

The least experienced and mid-career teachers participated in collaborations related to RtI implementation with great benefits. The most experienced teacher resisted participation in collaboration. The interview showed that the teacher did not view herself as an equal among her peers. In this instance, level of teaching experience seemed to contribute to differences in teacher attitudes towards collaboration.

All teacher comments demonstrated clear communication and understanding of the schools mission and vision. All three teachers indicated that **shared goals contributed to their sense of connectedness and encouraged collaboration within and between grade levels.** Moreover, the teachers indicated that **the school principal was instrumental in creating a safe environment for learning the RtI process. Trust and shared leadership were behaviours and practices demonstrated by the principal that supported RtI implementation.**

Finally, the teachers described the advantages and disadvantages of RtI. The teachers highlighted that the advantage of RtI was data-driven decision-making. The disadvantage was that RtI required much time, particularly time on documentation. The time spent on documentation was effectively taken from teachers' core task of teaching students. This caused demotivation and frustration among the teachers.

The dissertation by **Lee (2012)** is also focused on exploring levels of RtI implementation, but in the context of West Virginia elementary schools and within the content area of reading. Response to Intervention is a multi-tiered intervention model, usually incorporating three tiers, with instructional activity gradually intensifying from tier one (instruction targeting all students in the general education environment) to tier two (skill-focused, small-group, high-intensity instruction) and ultimately tier three (where children not responding to previous tiered instruction receive high-intensity intervention, often leading to a decision on

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their eligibility for placement in special education). In West Virginia, the implementation of RtI in reading at elementary schools has been mandatory by state policy since 1 July 2009. As part of this requirement, schools have been obligated to form curriculum teams, consisting of principals, counsellors and teachers, in order to support the use of high-quality models of teaching, scheduling, and other aspects of educational activity.

Within this context, the author sees it as relevant to perform a status-check on RtI implementation levels a few years after the inception of the new state policy. The nature of the study is descriptive, in that the author wishes to provide a snapshot of RtI implementation levels at one particular moment. This is done by employing a cross-sectional research design, with a survey submitted to curriculum team members at all of West Virginia's 435 elementary schools. The survey is designed to assess overall implementation levels as well as to allow for an analysis of potential differences in reported levels based on selected school attributes including enrolment, staff role, socioeconomic status, Title 1 status, AYP status (Adequate Yearly Progress), and principal tenure. The population for the study is the estimated 2,175 curriculum team members at all West Virginia elementary schools. The final sample, however, consists only of 285 curriculum members who responded to the survey.

The primary conclusion drawn from the study is that **West Virginia curriculum team members perceive RtI to be implemented at a high level in the area of reading in elementary schools.** Results show that a majority of RtI indicators are rated as *usually* or *always implemented* by curriculum team members. **Principals report the highest implementation levels, while classroom teachers report the lowest levels. For some RtI components, higher mean scores are reported in schools where the faculty shows a belief that RtI benefits all students, and in schools that have an evaluation plan in place for RtI.** For one RtI component, higher levels are reported by schools with smaller student enrolment and by schools receiving Title one funding (supplemental funding to local school districts to meet the needs of at-risk and low-income students). For two RtI components, higher levels of implementation are reported by schools that possess an electronic RtI data-management system.

The description of the study by **Bishop et al. (2012), set in New Zealand**, is primarily based on a research article, drawing on evidence from secondary sources when needed to make a full report of the findings. The study is focused on the relationship between a professional development programme that was designed to bring about changes in teacher practice through cycles of implementation and evaluation, and the associated changes in Maori students' educational outcomes. This relationship is examined by documenting the outcomes

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of the implementation of the Te Kotahitanga research and development project in schools in the third and fourth phases of the project. The Te Kotahitanga project commenced in 2001 with small numbers of teachers in phases one and two. Following this, the project was expanded into two further sets of schools in phase three (commenced in 2004) and phase four (joining the project in 2007).

The Te Kotahitanga research and development project sought to improve the educational performance of indigenous students in mainstream public secondary schools in New Zealand. It was primarily a pedagogically driven school-reform initiative, focusing on supporting teachers in their implementation of a culturally responsive, relationship-based pedagogy. As part of the Te Kotahitanga project, an Effective Teaching Profile (ETP) was developed, which formed the basis of the professional learning opportunities that were offered to teachers. The ETP was designed to identify the problems created for teachers by deficit-theorising about Maori students, emphasising that rejecting invalid explanations was a necessary first step towards developing viable classroom pedagogies. During this process, teachers were offered opportunities to draw explanations and practices from alternative discourses such as by listening to student narratives. Sharing these experiences of going to school enabled teachers to reflect upon their own understandings of Maori children, as well as upon the impact of their own teaching practices on the achievement of indigenous students.

In phases three and four, the professional development for teachers was conducted on site by in-school facilitators who were provided with professional learning opportunities by the university-based research and development team. The development process for teachers commenced with a series of formal and informal meetings at which the project was outlined to each school leader and staff. Once the school had agreed to participate, the professional development for teachers was promoted through a sequence of professional development activities, starting with an induction workshop. The introduction workshops were then followed by a cycle of the following activities:

- Individual teacher in-class observations using the Te Kotahitanga Observation Tool, intended to provide teachers with formative feedback so as to assist them to implement the ETP in their classrooms
- Individual teacher feedback provided by in-class facilitators about the lessons observed
- Group co-construction meetings for teachers of a shared class, including reflections on student participation and achievement evidence, as well as group goal setting
- Targeted shadow-coaching sessions, with in-school facilitators coaching individual teachers in their classroom or other environment

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In addition to these professional development activities, school staff members were involved in professional development sessions run by school leaders. The in-school facilitators were supported and provided with feedback by the university-based research and development team through workshops and regular in-school visits. As for funding, the project received central government funding from the New Zealand Ministry of Education, but with the expectation that schools would gradually start to fund the project themselves.

The results show that phase three schools are maintaining the changes made in teaching practices with the associated gains in Maori students' achievement. In addition, phase four schools are replicating this pattern of results. The authors argue that these findings have implications for sustainability and for assumptions about the strength of the association between project implementation, changes in teacher practice, and improved educational achievement for Maori students. To be sure of the strength of the association, it is necessary to be confident that the changes in teaching are associated with the Te Kotahitanga programme.

The results clearly state that teachers in schools in both phases performed similarly in terms of their implementation of the ETP, and that there was a clear association between the professional development project and the implementation of the ETP by teachers. The next step, the association between changes in Te Kotahitanga teachers' practice and gains in Maori student achievement, is shown in the different sets of evidence provided. These revealed that changes in the phase four teachers' classroom practices reflect changes in practice by the phase three teachers, with associated improvements in student outcomes present in both cases. In addition, in both phases there seems to be a similar pattern of positive sustained teacher–student relationships and improvements in the use of discursive practices, as well as an increase in the cognitive demand of the lessons, overall leading to positive changes in Maori students' completed work levels and measures of student engagement. With these different sets of evidence pointing to similar results in both phase three and four schools, and the only shared variable between schools being the Te Kotahitanga professional development programme, the authors argue that there is a good case to be made regarding the strength of the positive relationship between the implementation of the programme, changes in teacher practice, and improved outcomes for Maori students.

In closing, **the authors describe three main impediments encountered in the attempt to implement the Te Kotahitanga programme in schools**, demonstrating the difficulties associated with conducting a large-scale comprehensive school reform model with a Maori focus.

The first was **confusion about the culture of the Maori child**. The importance of culture to

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learning proved difficult to comprehend for many teachers and school principals, including project facilitators and regional coordinators. The second was that **the ability and willingness of teachers to implement the project varied**. Results revealed an uneven implementation of the Effective Teaching Profile by teachers both within and between schools, as well as uneven institutional support provided by leaders. The third was **problems with showing measurable gains**. It was not possible to randomly select participants, and researchers prioritised the schools' needs to produce evidence of student performance for formative purposes above the researchers' needs to acquire summative data.

In light of these challenges, authors conclude that **reforming secondary schools in order to make them responsive to the needs of Maori students is a long-term endeavour. The importance of sticking with the principles of the project in spite of problems faced along the way is thus underlined.**

The aim of the project by **Crompton & Keane (2012)** was to investigate the implementation of a whole-school one-to-one iPod Touch project in a middle school in the south-eastern United States. (The iPod Touch is a mobile digital music and video player device that can be used for educational purposes.) The research design was a case-study in a middle school in the south-eastern United States. The study aimed to capture the unique experience in the first phase of implementation of the one-to-one iPod Touch by conducting weekly classroom observations over a period of four months, and by conducting six focus groups with teachers and students.

The implementation involved teachers and students being given the iPod Touch devices. Thus teachers and students were practising the innovation of employing the iPod Touch in their classroom. The implementation process investigated in the study focused largely on the teachers' engagement and use of the devices. It gave some detail of the school principals' involvement as "change agent" in the project, but it did not describe the economy or strategy of the involvement in the implementation of the iPod Touch devices. The experience of the students who were at the receiving end of the implementation was also investigated in the study.

School teachers were categorised into adopter categories based on observations and focus groups. The five adopter categories were: innovators (risk-takers, often with prior experience with the technologies), early adopters (those respecting the opinion of role models and school principals and willing to adopt technology and also support others in doing so), early majo-

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rity adopters (often willing to adopt a technology but preferring to see others using it first), late majority adopters (adapting under pressure, but sceptical about the technology until it was in commonplace usage), and laggards (the last group to adopt, if they ever chose to). Of the nine teachers, four were categorised as "early adopters," two were "early majority," and three were "laggards."

The school had approximately 580 students and 55 teachers. The study involved approximately 350 participants: nine core teachers, and approximately 115 students at each sixth-, seventh-, and eighth-grade level. These classes were observed weekly over a four-month period, three months after the students and teachers were given the iPod Touch. A total of fifteen classroom observations were carried out over a range of subjects. The study involved six focus groups: three with three teachers in each group, and three with six students in each group from sixth, seventh, and eighth grade.

The principal was primarily responsible for the selection of teachers and for deciding which classrooms would be observed by researchers. However, the teachers selected for the study included both active and resistant users of the iPod Touch. The researchers pointed out that there was a sample bias specifically for the focus group: teachers selected the students for the student focus group, or students volunteered themselves. Thus the student focus groups primarily consisted of well-functioning students.

The results showed that students in the "early adopter" classrooms were enthusiastic about the iPod Touch: they understood how the technology fit into their instructional activities. Students in the "late adopter" or "laggard" classroom in the eighth grade were frustrated by their perception that the device was disruptive and offered little additional benefits, and thought school resources could be better spent elsewhere. These students also had negative opinions of the change agent (the school principal), and this also influenced their perceptions of iPod Touch use in their school. Thus the students' attitudes to the device were largely determined by the teachers' use of the iPod Touch. Teachers categorised as "late adopters" and "laggards" were assigned this category not because of their negative attitude towards the device, but because they lacked an understanding of how the iPod Touch could be used in their curriculum.

The researchers found that **the adopter categories were useful in describing how teachers approached the use of the iPod Touch, and they suggested that the categorisation could contribute to an improved implementation process by differentiating the approach to specific teachers. For example, a targeted workshop clearly demonstrating how a device**

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can be used in a specific curriculum could be the way forward for teachers who struggle to understand how to apply specific technologies in their curriculum.

The results reported by **Leadbeater et al. (2015)** come from two studies, both taken into consideration together and treated as a whole because they form part of the same research process, including results on start-up and take-up processes as well as considerations on the sustainability of interventions. The focus of the two studies is on describing experiences of discovering, actively evaluating and sharing the WITS programmes (Walk away, Ignore, Talk it out and Seek help) in rural Canadian elementary school settings. Thus the investigation is of the processes that promote or inhibit early users' discovery, understanding, incorporation, and sharing of mental health promotion programmes. In addition to examining the start-up processes related to the pre-implementation phase of the WITS programmes in rural school districts, descriptions of opportunities and challenges for sustainability were also provided, illuminating the factors that influenced planning for continued use of the evidence-based WITS programmes two years after their adoption in eight rural Canadian elementary schools.

The WITS programmes are evidence-based programmes that aim to create responsive communities in order to reduce peer victimisation and bullying among children from kindergarten to grade six. The programmes focus on increasing protective factors against bullying, such as social responsibility and positive school climates. Programme resources are easily accessible online and cater to school staff, parents, community leaders, and children, thus seeking to unite adults and children across the school, family, and community ecologies. The core components of the programmes are flexible in their implementation, and include creating a common language and set of norms ("using your WITS") that can be applied by all school or community members to deal with peer conflicts and increase social responsibility. This included lesson plans integrated with academic learning objectives, thus reducing time demands on teachers. The WITS programmes have two components: the WITS primary programme for K-3 and the WITS LEADS programme (LEADS adds a leadership component and trains children to Look and listen, Explore point of view, Act, Did it work? and Seek help) for grades four to six.

Both studies reporting on the WITS programme implementation used a qualitative methodology in the form of interviews with principals, teachers, community leaders, and other key stakeholders. Participating schools were located in rural communities in British Columbia, Canada. They received all programme books and resources (valued at C$1,000) as well as the supplies needed to continue the programmes (worth about $200). Additional support

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was available upon request, provided by the WITS programmes' community coordinator, who was employed by the co-developer of the programmes.

During the first part of the research process, in which uptake was studied, twenty individuals from seven elementary schools were interviewed, following a two-wave process. The following section reports results from the WITS uptake. Overall, the results revealed complex uptake processes, structured under the following four headings:

- *Pathways leading to the discovery of programmes*: Interviews indicated a variety of pathways that influenced participants' discovery of and willingness to consider the WITS programmes in their school, over and above the invitations received from the research team. Often participants recalled having heard of the programme and then rediscovered it when someone mentioned it or when they saw it in other contexts. This rediscovery process could help to convince a new principal to support programme uptake, for example, because he/she had heard of the programme before. These encounters with the programme can be labelled "passive diffusion" in that they were random and not actively sought. Word-of-mouth and peer-to-peer exchanges were also found to stimulate consideration of the programmes. In this regard, school counsellors played a key role in programme dissemination, often because they worked at several schools and talked about their experiences with WITS in multiple settings. In general, staff turnovers often occur in rural settings, and this is usually thought to disrupt implementation. However, in the process of uptake of WITS, turnover played a positive role by facilitating the flow of information across schools, as well as facilitating programme uptake when staff and administrators moved into schools already using WITS.
- *Personalising motivations for adopting the programmes*: Programme champions (opinion leaders, including principals, librarians and teachers who encouraged peer-to-peer communications about the ongoing use of the programme) freqeuently described their interest in WITS as centred on their personal beliefs about children's needs, emphasising how the WITS programmes were consistent with what they were already doing. This consistency with beliefs also influenced the motivation to try the programmes.
- *Alignment of programme characteristics with ongoing teaching strategies, school policies, and other programmes:* The perceived fit between WITS and styles and strategies created momentum for using the programmes. A positive response from teachers and children was also found to be key to programme attractiveness. The flexibility of the programme and its book-based curriculum made it a good fit in that it facilitated reaching both academic and social outcomes, acting as a support to teachers feeling the pressure of time and learning demands. However, an atmosphere of teacher overload, changing demands,

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and too many programmes could also sway personal beliefs against the adoption of programmes, as teachers might be reluctant to start yet another programme that was not guaranteed to last. Particularly for administrators, the fit of WITS with existing programmes and school policies was part of the motivation for uptake. In this context, WITS was seen not as competing for time and attention, but rather as serving existing approaches and as reflecting the need for new programmes to become part of the whole, or to blend in with other work.

- *Influencing others to use the programmes or to overcome barriers to programme adoption*: At some schools staff members were highly responsive, but in some cases, champions faced resistance to their efforts to engage others in the programmes. Programme uptake was seen as a process of exchanging old for new: of convincing teachers that the new intervention meant less work or better conditions rather than just something extra on an already full plate. Overall, staff characteristics provided very varying contexts for the strategies applied to influence the use of WITS. **Cohesive staff and openness to change made marketing the programmes easy at some schools, while at others, efforts to overcome resistance and avoid rejection resulted in covert or long-term uptake trials that limited dissemination.** In these cases, champions were forced to think of ways to get the programmes to students without burdening classroom teachers, including embedding the programmes at the school level as a means to engage students, with the hope of eventually bringing teachers on board.

Two other important challenges pertaining to the uptake of the WITS programmes were an ongoing union job action (which was damaging communication between teachers and administrators and possibly limited uptake by teachers in some schools) and additionally a lack of possibilities for compensating teachers for training time. Overall, **the results on uptake underline the importance of the first steps towards implementation. They shed light on the complexity of school organisations as sites for the delivery of mental health promotion and prevention programmes.**

The PhD thesis by **Roland (2012)** investigated the key challenges of implementing the Respect programme in two Norwegian schools. The programme aimed to reduce and prevent challenging behaviour in schools, including "concentration difficulties" and bullying. Representatives from teachers and school principals were part of the Respect group in each school, and their main task was to promote and support the implementation of the Respect work in their school. Previous research showed great variations in the effect of the Respect programme as implemented in various schools. (Other aspects of the study are covered in theme one, see section 3.2.)

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After six months of implementation, teachers in both schools were unsure and unclear about key principles in the Respect programme. Some examples also indicated that the teachers had little shared understanding of the concepts of the programme. Moreover, in terms of their knowledge of the concepts and visions of the Respect programme, there were few if no difference between teachers who were part of the Respect group and those who were not.

School A started the implementation process with high expectations, which gradually decreased over time and ended in indifference towards the programme. School B started off as insecure and hesitant, and a negative sub-group appeared to be influencing the obligation to the programme. **Both schools had negative experiences of previous "innovative programmes." A history of negative implementation attempts can adversely influence the feeling of obligation to a new programme.**

Teachers involved in the Respect programme in both schools wanted to be sure that the work would be collective and fairly distributed among all the teachers after six months from the onset of the programme. While there were teachers who followed the Respect principles, there were also those who did not show signs of obligation to the programme. **It appeared that the collective responsibility of the programme decreased in both schools over time.**

At the beginning of the intervention, many teachers in both schools were in doubt as to whether they had actually developed a shared understanding of managing "problem behaviour." Some thought they had too little time to establish shared understanding. Many teachers in the Respect group expressed that it was difficult to establish and agree on a shared strategy. All teachers were aware that a "collective understanding" was key to the success of the intervention. In both schools, teachers expressed that they did not have this shared understanding.

At the end of the intervention, most teachers in both schools agreed that they had not developed a shared understanding of managing behaviour problems. They explained that they collectively had spent too little time on the Respect programme, that elements of the programme had been excluded, and that principals had not revisited the issue after the workshops and training.

There appeared to be more resistance in school B than in school A; however, there were groups of resistance in both schools. Teachers in school B explained that the resistance to the programme was probably due to previous unsuccessful intervention programmes. Resistance could be both direct (negative attitudes) and indirect (indifference). Teachers

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who were negative towards the programme thought resistance had little negative effect on the implementation. However, most teachers thought that resistance adversely affected the teachers' Respect work.

Teachers in the Respect group observed the resistance to a greater degree than other teachers, and they were also adversely affected by this experience of resistance on a personal level.

At the onset of the implementation, most teachers in the Respect group did not perceive themselves as having greater responsibility for the Respect programme than teachers outside the group. Teachers who were not part of the Respect group, however, expected members of the Respect group to have a greater obligation towards the programme. **During the implementation it became clear that there were no greater obligations towards the Respect programme within the Respect group than outside it. At the end of the implementation, the Respect group was described as "invisible" in both schools**.

The work by **Cane & Oland (2015)** covers a UK national project, Targeting Mental Health in Schools (TaMHS). This seeks to offer support to schools in providing timely interventions and evidence-based approaches to help children and young people with mental health problems, and also those at risk of developing them. For a further description of the implementation see theme two (section 3.3).

All four schools in the study mentioned that **lack of time, planning and organisation, workload, and management were seen as constraints on implementation**. Other constraints pinpointed by the authors were **negative staff attitudes and poor staff awareness**. The participants in the schools suggested that **whole-staff awareness training should be optimised by means of educational psychologists** developing and offering whole-school awareness training in the area of mental health.

3.6.2 Results from two supplementary studies
Festas et al. (2015) study the implementation of the United States-based Self-Regulated Strategy Development (SRSD) instruction. They conclude that **successful implementation was dependent on positive attitudes towards the programme among teachers and students**.

The PhD thesis by **Mayer (2012)** investigates the implementation of the Levelled Literacy Intervention (LLI). The findings indicate that teachers had positive perceptions of implementation, monitoring, and feedback methods after participating in them. Teachers also

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reported significantly greater understanding of the essential LLI steps on post-ratings than on pre-ratings. The author noted that **it was very possible that the sample of teachers in the study were more committed to implementing LLI and more open to having their own behaviour assessed and discussed than the average teacher, since they had agreed to participate in the study after attending an introductory meeting of LLI**. Thus it is important to bear this particular sample of teachers in mind when considering the results.

3.6.3 Summary of the theme attitudes and perceptions
The key points across the nine studies included under the theme attitudes and perceptions can be summarised as follows. Positive attitudes and perceptions are vital for successful implementation. They are promoted by:

- Commitment and resources from management
- Time for planning and a reasonable workload
- Teachers' belief in the effectiveness of a programme or activity
- Differentiated approaches to individual teachers
- Staff being involved in choice of programme or activity
- Awareness training on the programme or activity
- Establishing and agreeing on a shared strategy and understanding.

3.7 Theme six: sustainability
The sixth theme is **sustainability**, and here the primary focus is on how the various programmes can be sustained in schools after implementation. Theoretical and practical aspects of this have been covered by Humphrey et al. (2016) in chapter two.

Two studies are included under this theme (Leadbeater et al., 2015; Lynch et al., 2012). Both have a school-wide target. One study is about the scale-up of a programme, the other a behaviour programme. The studies are presented in Table 3.7 below.

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Table 3.7: Table illustrating studies within the theme sustainability

Study	Country	Program/practice	Target	Design
Lynch et al (2012)	USA	SCALE-uP (Scaling-up Curriculum for Achievement Learning and Equity Project)	School-wide	Quasi experimental Mixed methods
Leadbeater et al (2015)	Canada	WITS program (Walk away, Ignore, Talk it out and Seek help - behavior)	School-wide	Longitudinal study: Cohort based study

3.7.1 The issue of sustainability

The study by **Lynch et al. (2012)** examines how three middle-school science curriculum units were implemented and scaled up in a large, diverse school system, and then assesses their sustainability four years after funding ended. This is done by retrospectively examining a research programme which was in function for six years from 2001 to 2007, and then revisiting its outcomes in 2011 in order to access the subject of sustainability. The programme in question, SCALE-uP (Scaling-up Curriculum for Achievement Learning and Equity Project), was designed to study the implementation and scale-up of three highly rated science curriculum units, each focusing on a particular area in science shown by research to be challenging for students. The programme followed a structure in which the individual units were first examined in order to determine if they were effective and equitable. If so, the units were scaled up in stages, then assessed in order to determine their effect under new conditions.

SCALE-uP was implemented in a very large metropolitan school system in the Central Atlantic region of the United States. The area was characterised by substantial cultural and socioeconomic diversity, as well as a long-standing tradition of top performances on state measures combined with high levels of participation in educational research activity. A quasi-experimental design with matched comparison groups and pre- and post-testing (at the beginning and end of each curriculum unit) was put in place, reaching a total of about 250,000 students and more than 120 science teachers. Pre- and post-test data consisted of student achievement results on science content assessments for both treatment and control groups under both small and large-scale conditions. These data were disaggregated by demographics in order to measure whether intervention effects were equitable. A range of qualitative data was also produced, including extensive classroom observations designed to measure fidelity as well as researcher notes and documentation of interactions with various different stakeholders.

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During SCALE-uP, teachers in treatment schools received professional development during the summers prior to the introduction of the unit materials in classrooms. Refresher sessions were given during the school year and in the intervening summers between trials. Comparison teachers received the district's standard professional development to review the science content that was the focus of each portion of the study. Furthermore, treatment teachers were provided with teacher guides and classroom sets of student guides, as well as sets of the required laboratory materials (financed by research funds).

Overall, student outcomes from the implementation and scale-up processes were mixed. Two of the science curriculum units were found to be effective and equitable as measured by assessments of students' science knowledge in the small-scale scenario, and therefore went to scale. One of these units was tested for effects on a large scale, and was shown to be ineffective when taken to scale. Outcomes on the effects of teacher experience with this unit were surprising, in that students of less experienced teachers had the highest scores. The authors perceive this as a likely consequence of high teacher mobility rates influencing the possibilities for ongoing professional development.

When examining the sustainability of the curriculum units four years after the end of research funding, the authors found that none of the curriculum units had been sustained within the school district. They explain this as a result originating partly from challenges pertaining to the individual interventions, and partly from environmental and contextual factors, in particular changes in the district policy climate. The description given by the authors is one of a policy landscape in constant flux in which educational goals, objectives, and obligations are ever-changing, leaving little space for interventions to settle – especially for those demanding rigorous implementation routines and time, such as the three science units contained in the SCALE-uP programme.

In conclusion, the authors point to intervention-specific as well as environmental/contextual factors shown to respectively promote or hinder the implementation, scale-up, and sustainability of the curriculum units. The most important of these were implementation fidelity, implementation support, personal mobility (teacher turnover), conflicting interests, difficulties communicating research results, and an unstable policy climate. Providing science teachers with implementation support in the form of materials and laboratory products seemed to act as a promoting factor.

- *Implementation fidelity*: The authors provide an example of how implementation fidelity has a vital significance for the effects (or lack thereof) of a given intervention. When im-

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plementing one of the units, researchers were frustrated by poor and confusing results on student outcomes. They decided to replicate the trial in a different set of schools, placing a strong emphasis on the fidelity of implementation. With this extra care taken to optimise fidelity, the intervention showed positive results and was allowed to go to scale.

- *Staff mobility*: Staff mobility was perceived to have a potentially undermining effect on professional development efforts.
- *Conflicting interests*: In some instances, there were conflicting interests between researchers and stakeholders, for instance when principals wished to use a research instrument designed for classroom observations of fidelity for teacher evaluations, which might potentially confound the research results and influence the perception of SCALE-uP.
- *Difficulties communicating research*: The authors faced some difficulties communicating research results to implementers, both for logistical reasons to do with large district size and because of difficulties in making research results understandable and usable for school personnel.
- *Unstable policy climate*: The unstable policy climate in the district, whereby new goals and standards were constantly having to be considered and where SCALE-uP curriculum units were competing with other interventions that carried higher stakes (and thus stronger incentives), undermined the possibilities for these units to succeed. Interventions demanding relatively large amounts of time and effort seemed not to be aligned with a policy climate in which more flexible and less demanding interventions, specifically those already embedded into the daily workings of schools, stood a better chance of survival.

The results reported by **Leadbeater et al. (2015)** come from two studies, both taken into consideration together and treated as a whole because they form part of the same research process, including results on start-up and take-up processes as well as considerations on the sustainability of interventions. The focus of the two studies is on describing experiences of discovering, actively evaluating and sharing the WITS programmes (Walk away, Ignore, Talk it out and Seek help) in rural Canadian elementary school settings.; Thus the investigation is of the processes that promote or inhibit early users' discovery, understanding, incorporation, and sharing of mental health promotion programmes. In addition to examining the start-up processes related to the pre-implementation phase of the WITS programmes in rural school districts, descriptions of opportunities and challenges for sustainability are also provided, illuminating the factors that influenced planning for continued use of the evidence-based WITS programmes two years after their adoption in eight rural Canadian elementary schools. (For more information see theme five, section 3.6.)

In this theme, the second part of the research process is reported, centring on the subject

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of sustainability. Twenty-four individuals were interviewed in April 2013, all having previously participated in at least one interview. These participants came from eight rural elementary schools. In this part of the study, fidelity was assessed by evaluating the use of eight core components of the programme, and the interviews focused on schools' planning for sustainability.

Four central aspects were found to be of relevance: within-school influence, influences of the external context, programme characteristics and support, and the effects of variations in implementation.

- *Within-school influences*: Leadership teams were found to play active roles in sustaining programme use, for instance by promoting the programme or ensuring that new members of staff were trained. Accountability to administrators also helped motivate teachers or other staff to continue using the programme. In addition, uptake from teachers was seen as particularly salient to long-term stability.

  Processes of embedding the programme and creating a common language were vital to sustainability efforts, with WITS being made a part of the school culture, codes of conduct, and everyday practice, as well as an integrated part of regular curriculum and teaching. It was found that all participating schools were maintaining the programme language even when they rarely used other programme components, leading to a description of the WITS language as "self-sustaining."

  Furthermore, ongoing communication and renewal of commitments were found to be required in order to sustain the programme, as well as a continued belief in the relevance and effect of the programme. Collaboration with a new community leader may also act as an antidote to programme decay, while being unable to sustain collaboration with a community leader could be a challenge to programme continuity. In this respect, turnover of children and staff was found to be a challenge as well as a promoting factor for sustainability. In general, participating schools experienced high rates of staff turnover, including rotations of principals. A process of transferring responsibility for implementation was therefore necessary, with sustainability depending on the uptake of ongoing teachers, children, and parents. It was found that when teachers take ownership and involve multiple stakeholders, this helped to sustain WITS when a school principal left, for instance. However, engaging or re-engaging multiple stakeholders over time also presented a challenge and required frequent renewal of commitments. The spread of the programme beyond single schools to numberous schools in a district also helped to overcome the challenges

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connected with children changing schools within the district, because the children were familiar with WITS. This was seen as a particular strength of the WITS programmes.

- *Influences of the external context*: The results indicated that policy changes coming from outside the educational system could limit needed collaborations with the community. The years in which WITS was being implemented were marked by two significant changes in educational policies initiated at the provincial level: one initiative appeared to enable WITS, while the second both reduced the time allowed for emphasising prevention and created uncertainty about the fate of WITS. Direct provincial support or endorsement by the British Columbia Ministry of Education could serve to enable the long-term sustainability of WITS. Overall, the continued growth of new programmes was seen as a potential threat to the long-term use of WITS: the district had a long previous history of waxing and waning programmes. However, it was the belief of some participants that WITS was resistant to infringing programmes.
- *Programme characteristics and support*: Considering the characteristics pertaining to WITS itself, the continued fit of programme resources was found to foster sustainability for some schools. Also, the access to ongoing support from WITS programme staff played a sustaining role. Meetings with the research team also helped to give a feeling of accountability, leading to reflections on what could be done to improve WITS implementation.
- *Effects of variations in implementation*: Schools varied in their use of core WITS components. Five schools implemented all eight core components, whereas three schools implemented only five or six components (the programme's less complex aspects, such as the WITS language). These three schools had difficulty maintaining the components that prescribed specific teacher and community leader activities. At some schools, the fidelity of programme implementation varied over time and was cited as a concern related to sustainability planning. Some programme components, such as the WITS language, were easily maintained, even in the context of changing environments for programme delivery, whereas other core aspects were dropped, compromising both fidelity and the likelihood of sustainability. Even in schools with high fidelity, concerns were expressed that the programme might fade over time unless sustained efforts were made to energise the programme.

Overall, the institutionalisation of programme language and activities into school codes of conduct and everyday practice helped ensure sustainability. On the other hand, staff turnover, declining stakeholder investments, difficulties in engaging cross-sectoral support, unfavourable policy environments, and the perceived advantages of competing programmes were identified as potential threats to programme continuity. Mediating between these processes

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of sustaining implementation or averting decay, the involvement of the school principal and the programme staff was required in order to promote the programme, provide opportunities for training new staff, update and renew resources, and resist encroachment from new initiatives. In this sense, both the school and the programme staff needed to anticipate and respond to ongoing changes both within and outside the school. Sustainability appeared to depend on how well programmes, schools, and policy environments worked together over time to cope with staff turnover, policy and priority changes, and competition from other innovations. Sustainability planning relied on regular staff meetings, active leadership, support from provincial policies, and innovation within the programme. Implementation quality appeared to intersect with sustainability, so that schools with better adherence to programme components were more likely to describe a firm plan for continued use of the programme. The multisectorial approach of WITS helped to foster sustainability by embedding stakeholder roles in the programmes' design, uptake, and implementation strategies.

To summarise. The above **results were perceived as underscoring the lifecycle theory of sustainability, suggesting that sustainability can be understood as a function of ongoing planning for renewing implementation in school settings, with both self-sustaining cycles and cycles that require work and effort**. The two studies overall point to the need for support not only for the initial uptake, but also across the programme's life cycle. **Sustainability is not merely a next step following high-quality implementation; it involves ongoing communication, evaluation, and re-commitment processes that must be anticipated both by school principals and by programme developers**.

3.7.2 Summary of the theme sustainability
Key points across the two studies included under the theme sustainability can be summarised as follows. Sustainability can be promoted by:

- Leadership
- Adequate training and professional development for teachers
- Establishment of a common language
- Ongoing planning for renewing
- Communication
- Evaluation
- Re-commitment
- Environmental and contextual factors

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3.8 Final analytical results regarding state of the evidence

The studies presented in this systematic review focus on what enables or hinders the use of evidence-based knowledge. The theoretical analysis shows that implementation processes are dynamic and multidirectional. It is of interest to see that the results from the studies are intertwined between the six themes.

Management and leadership seem to be the overriding factor for successful programme or activity implementation, not only as presented under the theme **management and leadership**, but also as directly related to the degree to which professional development, support systems, fidelity are taken care of and how attitudes and perceptions are influenced. The only important limitation in this theme is that many studies rely on an empirical basis that is mostly based on attributions and other information, in case-studies that cover only one or a few schools, and as a consequence of this, few school principals.

When it comes to **professional development, support systems** and **fidelity**, there is a rather firm empirical basis for concluding that training in itself is not enough. Training must be supplemented by supervision, coaching, and other local support measures in order to drive implementation. There also seems to be a need for longer and more comprehensive training than typically provided, and for booster sessions as well as data-based information on implementation fidelity.

Looking at the studies across the six themes, it becomes clear that complex programmes or activities with several components and levels are the most difficult to implement, and also demonstrate mixed or even contradictory outcomes. They are also relatively sparsely represented among the studies included in the systematic review. Finally, it is difficult in these studies to ascertain the relative importance of the components in producing expected outcomes. Examples here are Andreassen & Bråten (2011), Bishop et al. (2012) and Korkeamaki & Dreher (2011). The complex programmes or activities with several components and levels typically interfere with usual teaching routines and can pose a threat to teacher autonomy. Another factor that can hinder the implementation of new programmes or activities is that schools and teachers can feel a pressure of being held accountable for possible missing or negative academic results.

Universal mental health programmes (e.g. Cane & Oland, 2015 and Wolpert et al., 2013) or programmes targeting children with special needs (e.g. Barker, 2011 and Benjamin, 2011) are well represented in the systematic review. These typically use a strong design covering a large number of students. These studies also seem to have more successful implemen-

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tation than programmes targeting teaching and academic learning (e.g. Quint et al., 2015 and Wall, 2011). The reason behind this is that programmes targeting children with special needs typically last less than a year and the intervention is very specific, is well described, and is easy to understand and bring into action. Moreover these kind of programmes do not imply changes in the school's basic routines, do not threaten academic achievement, do not interfere much with teacher autonomy, and schools are not held accountable for lack of results. Programmes and activities aimed at teaching and academic learning often have time spans of several years, imply changes of routine, and may be perceived as a threat to teacher autonomy that may influence basic teaching competencies in a negative direction.

Relatively few of the studies are from the Nordic countries, so use of the results from the systematic review must take into account that attitudes and perceptions are important, and that there may be resistance among principals and staff towards evidence-based practices more generally, as well as towards complying with guidelines or manual-driven programmes or activities. Evidence-based programmes or activities may be met with active resistance, passivity, lack of compliance with guidelines or manuals, or even with indifference.

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4 State of the field

This chapter presents an overview founded on a qualitative study covering ten countries, states, or regions. The research questions were set in the original commission from the Danish Ministry of Education. They are:

1. How do the ten countries, states or regions approach knowledge transfer and knowledge mobilisation from research to practice in primary and lower secondary education, in both strategy and policy?
2. What is the role of institutions with responsibility for initial teacher training and in-service training of teachers for and in primary and lower secondary education in relation to knowledge transfer and knowledge mobilisation from research to practice?

4.1 Countries

The countries, states, or regions selected for the study are (in alphabetical order): Australia (New South Wales), Canada (Ontario), Denmark, England, Finland, Maryland (the United States), New Zealand, Norway, Scotland, Sweden. The overriding principle behind the selection of countries was that the structure of the school systems should resemble the Danish system, and therefore that the countries can be expected to a certain degree to contribute to knowledge relevant to Danish practice and research.

Denmark, Finland, Norway, and Sweden were chosen because they are members of the Nordic Council of Ministers. Denmark had the chair in 2015, and a central focus was knowledge transfer and knowledge mobilisation among the Nordic countries.

England, Maryland (the United States), New South Wales (Australia), New Zealand, Ontario (Canada) and Scotland were selected because they all have a structured and systematic – although differing – approach to the use of research-based knowledge.

4.2 Results

In this section, the most important findings from each country are listed under the issues that were taken up in the interviews:

- Policies and strategies for use of research findings in school
- Professional development of teachers: including both teacher education and in-service training
- Initiatives that support knowledge exchange
- Experience with knowledge mobilisation

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Issues one, two and four cover research question one: how do the ten countries, states, or regions work in strategy and policy with knowledge transfer, knowledge mobilisation, and the use of research-based knowledge in the development of practice in primary and lower secondary education?

Issue two covers research question two: what is the role of institutions with responsibility for initial teacher training and in-service training of teachers for and in primary and lower secondary education in relation to knowledge transfer and knowledge mobilisation from research to practice?

It can be concluded initially that there are many similarities between the ten countries, but there are also marked differences. This section presents the results of the state of field study under the five issue headings. The full state-of-the-field reports for the ten countries, states, or provinces are to be found in Appendix 7.

4.2.1 Policies and strategies for use of research findings in school
The state-of-the-field study has shown that all countries, states or regions included have recently undertaken reform in both policy and strategy, and that almost all have a focus on how to promote the use of evidence-based knowledge among school professionals as part of their reforms. Comparison of the countries, states, and regions show that policies for the use of research cover a broad spectrum.

At one end of the spectrum we find countries, states, or regions where the state has taken the lead in introducing research-based knowledge into schools practices, and here the state of **Maryland** is a clear example. In Maryland the Common Core State Standards were developed and published in 2010. The standards define the knowledge and skills that students should achieve from Kindergarten to grade 12. They are research- and evidence-based, they appear clear and consistent, and they are aligned with college and career expectations. Moreover, they are based on rigorous content and application of knowledge through higher-order thinking skills. The standards are built upon the strengths and lessons of the previously existing state standards, and finally, the standards are informed by other top-performing countries.

At the other end of the spectrum are countries that – as yet – have not developed centrally based strategies, but still intend to use evidence-based approaches in teaching and support local initiatives. The best example here is **Scotland**, where for example the School Improvement Partnership Programme (SIPP) uses collaborative inquiry. The purpose of the programme is to bring about improvement by enabling school practitioners to discuss with

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one another, to do research, to experiment with their practice and to look at the changes taking place in school. SIPP focuses on educational inequality, and draws on international research and practice demonstrating how local partnerships and collaborations are of significant importance for making effective school improvements. The intention here is to support partnerships that can lead to substantial and sustained development and increased attainment in the realm of practice.

Finland resembles Scotland in the absence of centrally based policies for the use of research-based knowledge. According to the national core curriculum of 2016, Finnish teachers are very much expected to use research or research-based knowledge in their practice; but because the core curriculum is very flexible, local education providers have the autonomy to implement this guiding document in different ways. Commissioned research is publicly available in Finland, but it is not a requirement that it is published specifically for practice in easily accessible and applicable formats. This means that the ministry's main avenue for promoting its commissioned research is through the media.

In **New Zealand** there is a central political interest in and focus on generating evidence, but the system relies on commitment among schools and teachers to implementing research and evidence so as to inform school practice. There is no overall policy or strategy on knowledge mobilisation in education, but there is a strong emphasis on teacher-led inquiry, which can be described as an evidence-based process that allows teachers to trial new methods and tools in relation to the needs of their classes. In other words, a teacher or school identifies a learning challenge and then gathers information, including looking more widely at research evidence, then identifies how to incorporate this information into their teaching practice.

At or around the mid-range of the spectrum, we find countries where the use of evidence forms part of a wider reform, or is supported by a range of institutions that collect and disseminate research and fund the use of research-based knowledge. **Sweden** comes closest to a centralised approach: its Education Act of 2012 clearly states that primary education in Sweden must be knowledge-based. Paragraph five of chapter one states that "Educational programmes must be based on scientific knowledge and proven experience." Thus the overall teaching principles, as well as their elaboration in practice, must incorporate research knowledge at their core. The Education Act determines the rights and obligations of local school authorities, students, and their caretakers, and can be seen as the backbone of educational policy in Sweden.

Another example is the state of **New South Wales**, where the Open Data Policy of 2013 as-

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sists agencies in embedding open-data principles in operations and in releasing high-value datasets which help to facilitate implementation of best practice. The Open Data Policy is a government strategy on information management and data-sharing. It aims to assist agencies across government in embedding open-data principles in their operations and in releasing high-value datasets, and it helps to facilitate the implementation of best-practice open-data principles across the public sector.

The province of **Ontario** uses a twin-track publishing strategy. One strand of this is to output material from a secretariat under the education ministry which helps school practitioners to put the best evidence-tested ideas into practice at school and classroom level. The other produces materials based on field knowledge of what teachers and principals are already preoccupied with and wish to do better. Publications are written in short, easy-to-read format. The idea behind these monographs is that they are pitched just one step further ahead of where the teachers are.

More distantly connected to centralisation we find **Denmark**, where the school reform of 2014 has been followed by heavy investment in in-service training and knowledge mobilisation among both teachers and pedagogues, with the aim of increasing teaching competency in all school subjects as well as qualifying teachers to make use of new research findings.

An example of the use of institutions is **England**, where the government has promoted the use of evidence in social policy through a broad range of initiatives such as the establishment of a network of seven What Works centres, including the Education Endowment Foundation (EEF). The EEF's programme uses quantitative methodologies to increase the amount of robust research, and through the use of these methodologies challenges higher education and other institutions to undertake more quantitative research in education. Through the Teaching and Learning Toolkit and through clear and actionable guidance, the EEF is also helping improving access to, and synthesis of, educational research. Another example is the establishment of a network of teaching schools to help other schools to improve and support the development of a self-improving system. Teaching schools are outstanding schools that work with other schools to provide high-quality training and development to both new and experienced school staff. As of February 2016, there were 538 alliances in operation, incorporating 689 teaching schools. Research and development is one of six priorities for teaching schools, and they help the schools in their alliance undertake school-based inquiry projects and support the schools in their engagement with and use of research evidence.

In **Norway**, the Norwegian Research Council's Programme for Research and Innovation

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in the Educational Sector came into operation in 2014, This long-term, policy-oriented pro-
gramme is designed to develop new knowledge for the entire educational sector. Knowledge
mobilisation is seen here as a highly complex process that not only requires easy access to
research and evidence, but also depends on the competencies, capacity, and learning cul-
ture of those who are expected to use research-based knowledge. A central objective in the
strategy for educational research is to make research findings readily accessible and easy
for practitioners to put into practice. Accordingly in 2013 the Ministry for Education and
Research invested in the establishment of the Knowledge Centre for Education, in order to
facilitate the use of research and to encourage teachers to engage with evidence.

4.2.2 Initial teacher training

Initial teacher training has also seen changes in the ten countries, states, and provinces
included in the state of field study. In those setting in which research and research-based
knowledge has not been part of initial teacher training at university level, teacher-training
institutions have been upgraded to become institutes of higher education with research-based
instruction. In some cases, as in **New Zealand**, teacher training for the youngest grades in
primary school may be in institutions outside the higher education sector.
Initial teacher training differs between the ten countries, states and provinces in the number
of avenues to becoming a teacher, in the requirements for certification, and in the existence
of a probationary period. Table 4.1 below illustrates the differences.

Table 4.1 Initial teacher training, certification and introduction period by country, state or province

Country/state/province	Teacher training		Certification		Probationary period	
	One	Several	Yes	No	Yes	No
Denmark	X			X		X
England		X		X		X
Finland		X		X		X
Maryland (USA)		X	X		X	
New South Wales (Australia)		X	X		X	
New Zealand		X	X		X	
Norway		X		X		X
Ontario (Canada)		X	X		X	
Scotland		X	X		X	
Sweden		X	X		(X)[1]	

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[1] Probationary period is an option for the teacher

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The table shows that only **Denmark** has a single form of teacher training – and Denmark is also the only country where only one teacher-training programme is located in university colleges, and where most teacher-trainers do not have research as part of their duties. Where there is more than one type of teacher-training programme, this may be because different teacher-training tracks point at different grade levels, as in **Finland** and **Sweden**. In other countries it is possible to take a three-year bachelor degree in a subject area followed by a one-year bachelor degree in education, or to take a four-year integrated programme, as in **England**, **Maryland**, **New South Wales**, **New Zealand**, **Ontario**, and **Scotland**.

As for requirements for certification, four countries – **Denmark**, **Finland** and **Norway**, plus **England** – have no certification. Certification may rely on an assessment at the end of initial teacher training, as in **Sweden**, or may have to be obtained after initial teacher training and renewed after a specified time intervals, as in **Maryland**.

Probationary periods are used in the following six countries or regions: **Maryland**, **New South Wales**, **New Zealand**, **Ontario**, **Scotland**, and **Sweden**. The probationary period typically lasts one year, during which the new teacher is assigned a mentor who offers professional support. It is interesting to note that (Sweden excepted) the Nordic countries, with their tradition of high teacher autonomy, also have the lowest degrees of certification and probationary requirements that can be seen as a prerequisite for autonomy at a later stage.

4.2.3 Continuing professional development
The most important provision of professional development regarding the use of research is to be found in the sphere of continuing professional development, as most practising teachers as of 2016 took their initial teacher training before the use of research became an area of focus.

The OECD Teaching and Learning International Survey (TALIS, 2013) has shown that there are huge differences between countries in the requirements for and participation in continuing professional development. For the ten countries, states or regions included in the state-of-the-field study, the requirements are shown in Table 4.2.

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Table 4.2 Requirements for continued professional development by country

Country/state/ region	Requirement
Denmark	No legal requirement
England	No legal requirement
Norway	No legal requirement
Sweden	No legal requirement
Finland	Three days per year
Maryland	All teachers must pursue professional development continually
New South Wales	Minimum 100 hours of professional development every three years
New Zealand	Participate in professional development at least every three years
Ontario	Appraisal every five years require professional development
Scotland	35 hours a year Career Long Professional Learning

The countries, states or regions in the table are sorted by two criteria – legal requirements or their absence – and thereafter in alphabetical order.

It can be seen that in four countries – **Denmark**, **England**, **Norway** and **Sweden** – there are no legal requirements at all. The other six countries or regions set legal requirements. The highest level is in **Scotland**, with 35 hours each year, closely followed by **New South Wales**, with an average of 33 hours a year. **Finland** requires three days a year (which can be estimated to equal 15 to 20 hours). **Maryland**, **New Zealand**, and **Ontario** have no minimum number of hours or days, but there are clear requirements for continuing professional development.

4.2.4 Support systems
Nine of the ten countries, states or regions have established several forms of support systems through which research results are disseminated into practice; in many cases, websites or data-hubs are part of the service provided to schools and teachers. The country that lacks any formal support systems is **Finland**, which places a high degree of trust in its highly trained teachers as professionals in their field.

The remaining nine countries can be classed into four groups. The largest of these groups comprises six countries that have established a several different support systems: **Denmark**, **New South Wales**, **New Zealand**, **Norway**, **Ontario**, and **Sweden**. Support systems here may be centrally placed learning consultants who can help schools, clearinghouses that collect and synthesise research, centralised institutions undertaking analysis and evaluation,

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annual educational research symposia, websites targeted at practitioners at both school and classroom level, online communication platforms for teachers, data-hubs where schools can compare their outcomes with other schools, best-evidence programmes servicing collaborative knowledge-building strategies, collaboration between schools and universities, and research dissemination series. Such support systems have been in place since the year 2000, with a marked increase in the last five years.

A second group consists of two countries which however are at different stages of establishing systems to support schools directly. One of these two countries is **England**, where initiatives from the Department of Education, especially since 2011, are supplemented by a series of organisations that fund and otherwise influence educational research and bring best practice to schools. There is the also the already-mentioned network of teaching schools, helping other schools to improve and aiding in supporting the development of a self-improving system. The other country, **Scotland**, has recently begun an action-research programme, the School Improvement Partnership Programme, based on collaborative inquiry. The aim of the programme is to improve the use of evidence-based research by enabling school practitioners to mutually discuss, to do research, to experiment with their practice, and to explore changes unfolding in schools. Another important player is an independent, self-regulating teaching council, funded by the teachers' union membership fee. An initiative here is the professional update (which involves teachers using evidence of impact) and their professional learning (which emphases reflection on practice, collaborative, and experiential learning and cognitive development). Using evidence on impact refers to teachers incorporating self-reflection on their own practice: a behaviour that encourages teachers to analyse what is going on in their classrooms.

The final setting, **Maryland**, has a top-down support system in place concerning evidence-based or evidence-informed approaches. The state is characterised by a strong centralised system in which the state education department initiates and monitors a wide range of initiatives, all of which are required to be research-based or research-oriented. One of these initiatives is the set of Common Core State Standards, which provides for collaboration between states on a range of tools and policies, including the development of textbooks, digital media, and other teaching materials. It also makes possible the development and implementation of shared comprehensive assessment systems that replace existing state testing systems with the objectives of measuring student performance annually and providing teachers with specific feedback to help ensure that students are on the path to success.

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4.2.5 Experiences with knowledge mobilisation

Experiences with knowledge mobilisation range on a spectrum from acceptance and compliance, to positive interest when teachers experience that research findings can help them in their classrooms or when they receive help in implementing research, to situations where traditions of high teacher autonomy conflict with specific advice on how to teach or the use of specific interventions.

Acceptance and compliance are highest in **Maryland** and **Ontario**. In Maryland, teachers trust that the strategies endorsed by their district are research-based and have shown effective results. In Ontario, teachers in general have positive attitudes to the use of research-based knowledge in practice. On top of this, the use of formal collaborative inquiry is a powerful mechanism for achieving valued and valuable professional development for teachers, enabling them to effectively bridge theory and practice, yet personalise their learning.

In the state of **New South Wales**, experience shows that there is still a need to convert research into tangible instruction for practice and to support use of the tools developed by the Department of Education. In **New Zealand**, teachers are interested in using research once they have applied it in their own classroom and they have experienced that the research helps them in their daily practice. Collaborative inquiry has also been found to aid reflection in this setting.

In two countries, the experience is that help is called for in order to implement research. In England, best practice is found where school-based trainers and mentors are also actively engaged with research and evidence-based teaching. In Scotland, experience shows that changing culture takes time, but that it helps when researchers present their results to teachers orally, as this is a more persuasive way as questions can be clarified immediately.

In the Nordic countries, **Denmark**, **Finland**, **Norway**, and **Sweden**, where traditions of a high degree of teacher autonomy conflict with specific instructions on how to teach or even the use of concept-models of intervention, knowledge transfer can be difficult. Teachers have traditionally been concerned with practice-based knowledge more than evidence-based knowledge, which can be perceived as less relevant for their practice. Local authorities are highly decentralised and therefore need guidance in working with research-based education. Additionally, municipal actors, school principals, specialist teachers, and collaborative teams all have an important part to play in implementation. Ultimately experience indicates that there is a need for research results to be made more tangible and more easily used for teachers.

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An experience that applies to all countries but with differing weight is that teachers are generally pressed for time. They have found using evidence-based or evidence-informed practices to be an additional burden on top of their ordinary preparation.

4.3 Summary of the state of the field

Policies and strategies for the use of research findings in schools are closely connected to local school traditions. They vary from centrally controlled knowledge transfer to decentralised models featuring bottom-up approaches.

Professional development is also strongly related to traditions. Almost all countries have several routes to become a teacher, followed by a centrally established certification process. About half of the countries require probationary periods for newly trained teachers, and there are legal requirements for continuing professional development. A few countries, among them Denmark, have very lax requirements.

Initiatives that support knowledge transfer and knowledge mobilisation may be strongly centralised or strongly decentralised. Most countries, however, rely on a suite of different support systems, ranging from foundation institutes or organisations, to centrally placed learning consultants, to website-based information bases, to discussion forums for teachers to share experiences, to collaboration between schools and universities, and finally to the use of collaborative inquiry models in which teachers work together to identify common challenges, analyse relevant data, and test out instructional approaches.

Experience with knowledge transfer and knowledge mobilisation show acceptance and compliance in some country contexts and resistance to change that puts limits on sustainability in others. Again, these differences are related to local traditions, ranging from relatively fixed curriculum-controlled instruction to high levels of autonomy.

The most effective approach to the implementation of research findings in schools seems to be a combination of central control deployed simultaneously with initiatives supporting bottom-up activities that are based on listening to teachers' needs and wishes and on the use of collaborative inquiry. Requirements for certification, probationary periods, and mandatory continuing professional development are important additional elements in effective knowledge transfer, as are support systems that ensure that knowledge derived from research reaches the teachers in their classrooms.

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5 Conclusion

This report is the fruit of a systematic review and a state-of-the-field study. The systematic review covers international empirical research on what enables or hinders the use of research-based knowledge in primary and lower secondary school. The state-of-the-field study reports on ten selected countries or regions, with the aim of showing how these countries or regions have approached research-based knowledge transfer into schools at both strategy and policy level, and also showing the roles played in this process by institutions with responsibility for teacher training and in-service training.

The systematic review was conducted by searching eight databases and 26 Scandinavian sites, yielding 73 studies that were assessed for relevance and quality. Of those, 34 studies are included in the narrative synthesis. They have varying aims, use different methods, and the results can be difficult to combine and generalise. Drawing on theory, prior empirical research and experience in the ten countries and regions in the state-of-the-field study, however, it has been possible to produce a joint and nuanced picture of what promotes or hinders the implementation of research-based knowledge in schools.

In the state-of-the-field study, data from relevant policy documents and from strategy and vision papers from the ten countries and regions were studied, and central players at policy level in the ten school systems were identified and interviewed.

Theory and practice in the field of implementation have been with us for 35 years. Both theoretical and practical work have demonstrated that implementation is a multidisciplinary field whose study is of how research findings are transferred, implemented, and sustained by target audiences. Five components in knowledge transfer and three knowledge-transfer processes can be identified. In educational settings, processes are not linear but tend to interact in a dynamic, multidirectional process. This focus on the connection and exchange between the users and producers of research emphasises the personal nature of the implementation process.

Initiatives to begin the implementation of the results from empirical research can come from several levels: from central government, from the local municipal level, from schools working collaboratively in networks (in some cases universities may be part of school networks), and from single schools.

5.1 Six thematic areas

Initiatives must be followed by a number of activities that must be carefully planned and implemented to produce the desired changes in school practice. The theory, the systematic

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review and the experiences from ten countries and region show that these activities centre around six thematic areas: **management and leadership, professional development, support systems, fidelity, attitudes and perceptions**, and finally **sustainability**. The review and the experiences from the ten countries and regions show that each of these six areas is of vital importance in the implementation processes of research-based knowledge, whether this be in the form of specific interventions or a more conceptual form, such as collaboration between schools. The review and the experiences also demonstrate that there are several factors within each area that can hinder implementation. The experiences, in particular, also show that there are cultural differences between countries which influence the implementation of research-based knowledge in schools.

Above all, initiatives rely on management and leadership. If the initiatives come from the centre, it must be decided how the implementation process is to be monitored at local municipal level, and this level must, again, follow up with individual schools. Experience from the studies shows that failure to follow up at a local level has led to big statewide reforms failing to deliver measurable results (Finland, Norway). Experience from two of the countries in the state-of-the-field analysis have also pointed to how statewide initiatives have been implemented with success either by introducing research-based knowledge into the national curriculum (Maryland) or by establishing comprehensive processes to transfer research-based knowledge to the school level, with the inclusion additionally of bottom-up processes (Ontario).

Whether the initiatives come from central or from local municipal level, the most important and decisive management and leadership processes are in the individual schools. School principals or management teams must be enthusiastic supporters of the implementation – not just at the beginning of the implementation, but also during and after implementation. They must ensure sufficient financial and human resources and administrative support. They must also select key staff members to take and maintain responsibility for the process. Finally, they must motivate the whole staff and be prepared for the setbacks that will always come during the implementation of innovations. High expectations, personal support, and caring relations are important. Almost all studies in the systematic review show how important local management and leadership are; and there are studies that show how lack of leadership can ruin an implementation process.

The second component in the knowledge-transfer process is **professional development**, which can be subdivided into initial teacher training and continuing professional development. Here, institutions providing initial training and in-service training play an important role.

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Regarding initial teacher training, comparison of traditions among the ten countries in the state-of-the-field review is interesting. One country stands out for its initial teacher training being on the master's level (Finland), and in this country teachers are expected to take responsibility for bringing research-based knowledge into their teaching, since they themselves have experience with research. In all other countries but one (Denmark), teacher training is research-based, and training is, with a few exceptions, provided in universities. Danish teacher training is research-informed and the single route to becoming a teacher takes place in university colleges.

Continuing professional development also differs considerably between the ten countries and regions. About half require probationary periods for newly trained teachers, and there are legal requirements for continuing professional development, of which the highest level is in Scotland with 35 hours per year. A few countries (among them Denmark) have no formal requirements for continuing professional development.

The review demonstrates that professional development is vital to the implementation of research-based knowledge in regard to introducing and following up implementation, both in terms of re-culturing staff attitudes and of changing daily practices. Professional development should not just take the form of courses introducing theoretical and practical facts and procedures, but should be given in a multitude of channels, including guidance and support in the classroom and feedback based on observations, video recordings, and data from students. Practices that include team collaboration and the chance to share experience both between teachers and between schools are important. Partnerships with other schools, school districts and universities also aid implementation. Several of the studies in the systematic review show that teachers with too scanty knowledge of the content and procedures in the implementation process, which has led to poor or no results.

The third component in implementing research-based knowledge in schools is **support systems**. Professional development can provide initial knowledge for implementation, but it is also necessary to establish support systems. Such systems can be strongly centralised or very decentralised. Most countries in the state-of-the-field analysis rely on a suite of different support systems, ranging from foundation institutes or organisations, centrally placed learning consultants, website-based information bases, discussion forums, collaboration between schools and universities, to collaborative inquiry models. The systematic review gives a rather firm empirical basis for the conclusion that training in itself is not enough. In order to drive implementation, training must be supplemented by supervision, coaching, and other local support measures. Longer and more comprehensive training seems to be

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necessary than is typically provided, along with booster sessions and data-based information on implementation fidelity.

The next component with very strong links to management and leadership, professional development, and support systems is **implementation fidelity**. Fidelity in implementation is crucial to the attainment of positive effects. The state-of-the-field analysis is unable to point at country-specific differences in how fidelity is assured. Common across the results from the systematic review is that teachers tend to stick to their known routines rather than following written instructions and guidelines. The norm often seems to be practice-based evidence, rather than evidence-based practice – a feature that signals that teachers and schools struggle to follow rigorous protocols or manuals. The optimal delivery model for school-based interventions may be described as flexibility within fidelity: that is, the effort to strike a good balance between prescriptiveness and flexibility. Checklists, video observations, and group feedback sessions are therefore important, together with data from students. Obstacles to fidelity are the lack of time, teachers' non-perceptions of the relevance of the programme or activity, interference by meetings, test-taking, and field trips, and high turnover rates of teachers or school principals may interfere with the implementation.

Component number five is **attitudes and perceptions**. Positive attitudes and perceptions are vital for implementation success, and they are best fostered in the professional development phase, where policy language and clarity of implementation procedures are assured. The state-of-the-field study shows a pattern of relatively high acceptance and compliance among principals and teachers in some country contexts, while in others there is more resistance to change, which in turn restrains implementation. These differences are related to local traditions, from relatively fixed curriculum-controlled instruction (Maryland) to high degrees of autonomy (especially the Nordic countries).

The sixth and last component is the issue of **sustainability**. The state-of-the-field analysis does not yield information of country-specific differences in how sustainability is assured – except perhaps in Ontario, where the interviewee said:

> New teachers have an obvious orientation towards a research focused attitude, collaboration, and a habit of mind of questioning. In general the teachers have a learning approach to their work, and they believe that teaching is complex and that their professionalism must be founded on a solid groundwork.

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But the interviewee ends with a remark that is heard in all countries:

> The time frame is a general concern for the teachers and
> definitely a challenge for their daily work.

The systematic review points to sustainability being the product of several factors all working together: a shared language, communication, ongoing planning and renewal, evaluation, good relations, and re-commitment. Changes in policy climate and the termination of funding can damage sustainability, and there also seem to be life cycles for intervention projects that are connected to new projects building on newer research results and change in paradigms.

5.2 Types of interventions

Looking at the studies across the six themes, the systematic review shows that complex programmes or activities targeting specific academic areas with several components and levels (such as reading, mathematics and science)are the most difficult to implement. They also tend to interfere with usual teaching routines, and they therefore pose a threat to teacher autonomy. Moreover, schools and teachers may be held accountable for any missing or negative results.

Universal mental health programmes or interventions targeting children with special needs are well represented in the systematic review, and typically use a strong design covering a high number of students. These studies also seem to have more successful implementation results than programmes and activities targeting teaching and academic learning. The reason here is that programmes targeted general mental health or children with need of specialised support typically last less than a year, the intervention is very specific, well described, and easy to understand and bring into action. Moreover it does not imply changes in the school's basic routines, it does not threaten academic achievement, it does not interfere much with teacher autonomy and schools are not held accountable for lack of results.

5.3 Needs for further research

In regard to future research to what promotes or hinders the use of evidence-based knowledge in primary and lower secondary schools some central issues are clear.

The rigour and relevance of educational research in Europe has increased over the last decade, but still there are challenges regarding relevance, quality, and funding. Many different methodologies are used, and the results of research in the same issues may differ, demonstrating the complexity of the field. Most educational research on implementation has been

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either conceptual and theoretical in character or has been related to evaluations of specific programmes or interventions, mostly addressing mental health or behavioural problems among students. Future research should move beyond the individual, the classroom and the curriculum focus; it should embed evidence-based prevention within a school-wide and multicomponent approach.

More than half the studies included in the systematic review are from the United States, where the traditions of fixed curricula and relatively low teacher autonomy differ from Europe and especially from the Nordic countries. This constitutes a bias, as the country- and region-specific factors may influence the results of the studies: in a changed geographical/ cultural context, the findings might be different. Even though several of the themes in the synthesis – professional development, support systems, fidelity and sustainability – can be considered to have more or less the same influence in the ten countries, states or regions, it would be valuable to have more studies in the European and especially in the Nordic contexts.

Furthermore, large sample sizes and a more widespread use of longitudinal research designs would strengthen the evidence base by providing robustness as well as opportunities to study the implementation of evidence-based knowledge in the educational field over time.

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Appendix 1 Methods used in the systematic review

The methodological approach used for the systematic review is described in this appendix. The overall approach and the specific methodological choices that underlie the review are presented so that the way in which the systematic review was carried out will be evident.

Background and approach

The systematic review is based on international literature and guidelines for conducting systematic meta-studies, and specific experiences of systematic research mapping and full systematic reviews carried out by the Danish Clearinghouse for Educational Research.

Design and process

The systematic research mapping was carried out using the **EPPI Reviewer 4**[2] software, a web-based application for systematically and transparently managing and analysing data when conducting reviews and mapping research. It contains detailed code sets for classifying educational research and for assessing the quality and relevance of studies. The systematic research mapping was carried out in accordance with standard practices at the Danish Clearinghouse for Educational Research.

The figure below provides an overview of all the phases of the systematic research mapping and synthesis:

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[2] For a further description of the EPPI Reviewer tool, see the producer's web page: http://eppi.ioe.ac.uk/cms

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Overview of systematic research mapping and synthesis
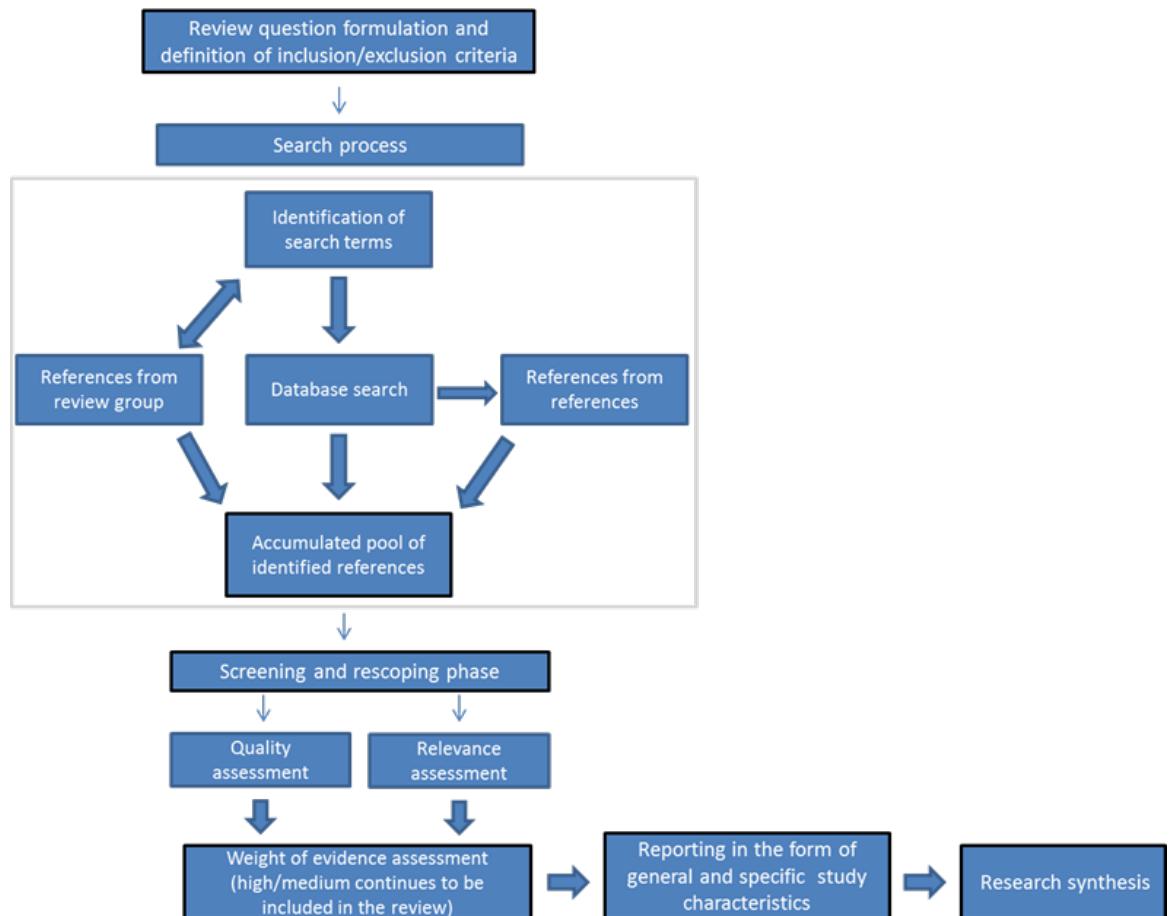
The first phase of systematic research mapping is establishing a research protocol, including the formulation of review questions and criteria for inclusion and exclusion (see Appendix 7), conceptualisation, scope limitation and developing a general description of the approach, methodology and phases of the systematic research mapping. The research protocol acts as a management tool, providing both a framework and a point of departure for the entire review process. The review group contributed suggestions for, and reviewed the protocol.

This systematic research review is restricted to studies that were published between 1 January 2011 and 1 March 2016.[3]

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[3] The last search was performed on 1 March 2016. All databases and journals were searched between 27 January and 1 March 2016.

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The second phase is a systematic search based on an explicit search strategy, focal points of which were definition of scope, systematic stringency, focus, and transparency. Furthermore, limitations on time and resources defined a natural upper limit for the number of studies that could be processed and included in the systematic review (Gough et al., 2012). Still, the aim of the systematic research mapping was to identify as many studies as possible that fit the inclusion criteria. It is worth mentioning that exhaustive searches are never possible and there will be gaps in any given search strategy, and there will always be relevant studies that are not identified.

Multiple databases were searched (see Appendix 4).

When combined, the various sources provided a pool of 10,077 references. After all the searches of the databases and the manual searches had been completed, a duplicate check was carried out with the EPPI Reviewer 4, and as a result, 845 references were removed before the screening process. The remaining 9,232 references were screened according to the inclusion and exclusion criteria (see Appendix 7).

During the screening phase, explicit criteria, based on the scope of the systematic research mapping and the review questions, were applied to each reference, in order to determine whether it should be included in, or excluded from the systematic research mapping. For instance, these criteria cover publication date, country of origin, publication type, and whether or not they focus on implementation. It should be noted that a study could be excluded for several reasons. Research quality was not used as a criterion for inclusion or exclusion from the studies. The figure below gives an overview of the screening process:

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Number of hits from the search	→	10,077 references identified
Duplicate check	→	845 references identified
Screening based on title, abstract and full text	→	9,232 references for screening
Exclusion of studies	→	9,159 references excluded
References for assessment	→	73 references
References included	→	34 studies

The screening process

The screening phase yielded 73 references for inclusion; 9,159 references were excluded. Next, we began the data extraction phase. In this phase the 73 studies included were read in their entirety, relevant data was processed and extracted, and the quality of the studies was assessed. The data extraction system of the EPPI Reviewer 4 contains sets of both general and specific questions, called "guidelines," which register, characterise, assess, and report the content and quality of the studies. The "general" guidelines are intended to extract and register general information that is relevant to any systematic review, regardless of subject

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matter and field of research, such as research design, country, and year of publication. The "specific" guidelines are designed to extract and register data concerning the specific field of research of a given systematic review, such as specific outcomes and type of intervention. When combined, the two sets of guidelines insure that all the studies included are processed and registered in a standardised manner. The guidelines are constructed as coding tools with multiple-choice questions and expandable text boxes for adding information to each answer.

Following the data extraction process, each study was assessed with regard to research **quality** and review question **relevance**. Based on this, each study was assigned an overall weight of evidence classification of "high," "medium" or "low." The overall weight of evidence may be characterised as a systematic assessment of the extent to which the studies met shared scientific standards for empirical research while being relevant with regard to answering the review question of the specific systematic review (see Appendix 2).

Thirty-four studies were categorised as presenting a medium or high weight of evidence and are included in the synthesis.

The last phase of the systematic research mapping was the characterisation and synthesis **prospect** phase. In that phase the results of the systematic research mapping were reported, and the identified research was characterised. Afterwards, the data was inductively searched for themes and trends among the 34 studies included, and following an assessment of their potential to produce a synthesis based on the systematic research mapping, a narrative synthesis was conducted. During this last phase, abstracts were made for all included studies of "medium" or "high" overall weight of evidence. Studies that were assigned a "low" overall weight of evidence were included in the characterisation, but not in the narrative synthesis.

Method of the narrative synthesis

Thirty-four studies were found eligible to be included in the synthesis. These 34 studies were assigned an overall weight of evidence of "high" or "medium" in the quality assessment phase of the systematic research mapping.

Gough et al. (2012) describe the systematic synthesis as the specific part of the systematic review process where one "need[s] to understand the results of individual studies and ascertain what they mean as a collective body of knowledge" (ibid.: 180). Gough et al. (2012) further state: "The outcome of the synthesis is a narrative that tells a trustworthy story (see Popay et al., 2006) answering the review question and also telling the reader what the findings mean." (ibid.: 185). The studies available for this synthesis are quite heterogeneous in their

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focus, and in the design and methods of analysis applied to the studies. Hence, the present synthesis was conducted as a "narrative synthesis" (cf. Gough et al., 2012; Popay et al., 2006), which aims to combat the findings of the available studies in a systematic way and analyse how differences among the studies may be explored and explained by working on a higher level than the individual study. A thematic approach is applied in order to develop a broader perspective on the findings of the studies and what constitutes the findings, part of this also being the authors' conclusions and explanations of their findings (Gough et al. 2012: 195).

A thematic analysis is a fruitful way to systematically organise and analyse a set quantitative, qualitative, and mixed-method studies. Popay et al. argued that a thematic analysis "can be used to identify systematically the main, recurrent and/or most important (based on the review question) themes and/or concepts across multiple studies" (2006: 18). An advantage of applying a thematic approach is that it offers the opportunity to summarise and directly reflect on the main concepts, findings, and conclusions from the studies included, rather than drawing, or even trying to draw new knowledge from the collected and possibly diverse body of studies (ibid.).

According to Popay et al. (2006), analytically, the narrative synthesis consists of four distinct elements/phases that are conducted in a sequence. However, in practice the synthesis will involve iterative movements among the various elements. The present synthesis is no exception. The four elements of the narrative synthesis are briefly described as follows:

The first element consists of developing a theoretical model of how the effect(s) observed in the study come about, why they do so, and for whom. At this point it may be useful to consider developing a "theory of change" (see Weiss, 1998: 55; Wholey, 1987: 78). The theoretical model may be used to interpret the findings of the synthesis, and may be useful in an assessment of how broad the applicability of these findings is. The theoretical model is presented in chapter six.

The second element aims to develop a preliminary synthesis of the findings of the studies available for the synthesis. This is done by organising the findings in order to develop an initial description of the studies, look for possible patterns in the findings across the studies, and on that basis, to further determine the direction and the impact of each of the investigated factors on use of research knowledge in schools.

The third element goes a step further and subjects the emerging patterns in the findings that have been obtained from the studies to interrogation, in order to:

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a) Identify any (contextual) factors that might explain the possible differences found with regard to the effect and direction of each of the factors investigated across the studies.

b) Understand how and why certain investigated factors are found to have/not have an impact on students' language acquisition when learning a third language in school (cf. Popay et al., 2006: 14).

The fourth element includes an assessment of the robustness of the synthesis. This is a complex task which, somewhat simplified, may be said to consist of four different aspects. These include aspects of both the synthesis as a whole and issues in each of the 34 studies that form the basis of/set the premises for the synthesis in the first place. The assessment of the robustness of the synthesis will be given in Appendix 2.

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Appendix 2 Assessing the overall weight of evidence

Assessing the overall weight of evidence
The quality and relevance of the studies included in the systematic research mapping were assessed by assigning each study a specific weight of evidence comprising categories ranging from "low," to "medium," to "high." This assessment is applied to every review done by the Danish Clearinghouse of Educational Research, although it has been developed, optimised, and therefore altered slightly over time.

The weight of evidence indicator constitutes the last section of the general guideline and consists of three variables: A: the quality and trustworthiness weight, B: the relevance weight and C: the overall weight of evidence (A and B combined).

Before going into a more in-depth explanation of variables A, B, and C, it is important to emphasise that the term "weight of evidence" may be considered misleading, because it is often used to reference a sort of ranking or hierarchy of research designs. In such a context, studies that apply RCT or meta-analysis-based designs are often regarded as yielding superior types of evidence, owing to their high levels of robustness and the trustworthiness of their statistical power. However, in the context of systematic review designs, the evidence ladder approach may often lead to the exclusion of large parts of research fields where RCTs, meta-analysis (and even quasi-experiments) are rarely utilised. At the Danish Clearinghouse for Educational Research we aim to include as much relevant empirical research as possible in our reviews, without risking compromising the review quality.

Evidence ranking based solely on design type was discarded and replaced with the current weight of evidence indicator that has the more basic and moderate purpose of simply ensuring the quality and relevance of the studies included, thereby establishing a baseline or standard for studies, regardless of research design, but depending on general research standards and study scope.

With the foregoing background as a point of departure, we now elaborate and define variables A, B, and C.

A: Trustworthiness and research quality. A is essentially an overall assessment of the quality of a given study, and focuses on the degree of trustworthiness that may be attributed to the findings of the study. A should be considered a summary variable of questions concerning core research quality standards found in the general guidelines, primarily related to transparency, reliability, and validity. It is the overall quality imprint the study leaves, regardless of research design.

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B: Study relevance. B is a rating of how relevant the study findings (which were assigned a degree of trustworthiness by A) are, with regard to answering the review question of the present review. For instance, the study in question may contain only a small section that contributes to answering the review question, and unless this small section contains evidence of great importance, the study should be considered less relevant to the review (and carrying less weight), even though it may be considered very trustworthy with regard to research quality (A).

C: Overall and combined weight of evidence. C is to be regarded as a processual combination whereby A conditions B, and A and B condition C, rather than as simply a mean-rating approach along the lines of A + B/2 = C. The logic behind this is that no study may be considered to carry a great weight of evidence if it is of poor quality and therefore untrustworthy, regardless how relevant its focus and findings may be. On the other hand, a study of very little relevance but very high trustworthiness falls into a similar category. Therefore, the greatest overall weight of evidence (C) must be assigned to studies that are both highly trustworthy and relevant to the systematic research mapping.

In addition to the definitions above, two entire sections of general guideline questions – Sections D and E – underlie the assessment of the quality variable A. In order to ensure further transparency, the primary questions of these sections are presented in tables below that also display the frequency distribution of the studies in relation to each question.

The first set of section questions is related to the transparency of the studies:

Transparency of the studies

Question	Yes	No	None of use
Is the context of the study adequately described?	64	9	0
Are the aims of the study clearly reported?	68	5	0
Is there an adequate description of the sample used in the study and how the sample was identified and recruited?	55	17	1
Is there an adequate description of the methods used in the study to collect data?	54	19	0
Is there an adequate description of the methods of data analysis?	53	20	0
Is the study reported with sufficient transparency?	51	22	0

n=73

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The table indicates that the studies meet general research standards for transparency. This is especially true with regard to whether the context of a study is adequately described (64 studies), and the transparent reporting of study aims (68). The studies also exhibit sufficient transparency in relation to how samples are identified and recruited (55), data collection methods (54) and the methods used for analysing the data (53). Lastly, a great majority of the studies (51) were generally found to be sufficiently transparent.

The second set of section questions is directed towards the more direct reliability and validity of the studies:

Reliability, validity and research design

Question	Yes, completely	Yes, to some extent	No, none
Was the choice of research design appropriate for addressing the research question(s) posed?	12	42	19
Have sufficient attempts been made to establish the repeatability or reliability of data collection methods ?	26	32	15
Have sufficient attempts been made to establish the repeatability or reliability of data analysis?	27	33	13
Have sufficient attempts been made to establish the validity or trustworthiness of data collection and methods?	19	35	19
Have sufficient attempts been made to establish the validity or trustworthiness of data analysis?	18	36	19
To what extent are the research design and methods employed able to rule out any other sources of error/bias which would lead to alternative explanations for the findings of the study?	9	38	26

n=73

The table above indicates greater inconsistency in quality with regard to reliability and validity than in the transparency section. Relatively speaking, the best results are for reliability, where 26 to 27 studies completely meet the criteria. Validity is slightly lower, with 18 and 19 studies in the best category. Study appropriateness yielded twelve studies in the best category, whereas ruling out bias or error yielded only eight studies in the best category. Overall, the general level of validity and reliability may be considered moderate.

To determine whether a connection exists between levels of transparency and reliability of

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the studies, these were cross-tabulated. As shown below, there appears to be a large, consistent group of studies that are both sufficiently reliable and transparent.

Reliability by transparency

		Is the study reported with sufficient transparency?	
Have sufficient attempts been made to establish the repeatability of reliability of data collection?			
		Yes	No
Yes, completely		23	3
Yes, to some extent		24	9
No, none		4	10

n=73

The next table shows a cross-tabulation between bias reduction and transparency. It indicates that studies with a high degree of bias reduction also appear to be reported with sufficient transparency.

Bias by transparency

		Is the study reported with sufficient transparency?	
To what extent are the research design and methods employed able to rule out any other sources of error/bias which would lead to alternative explanations for the findings of the study?			
		Yes	No
A lot		6	2
A little		27	11
Not at all		17	10

n=73

The sections and questions of the general guidelines that underlie the quality variable weight of evidence, A, has now been made transparent, and we reach the end of the assessment funnel: the table that displays the frequency distribution of all three weights of evidence

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among the 73 studies included.

Weight of evidence

Weight of evidence	Number of studies		
	High	Medium	Low
Weight of evidence A: Trustworthiness and research quality	8	30	35
Weight of evidence B: Study Relevance	12	47	14
Weight of evidence C: Overall and combined weight of evidence	7	27	39

n=73

Keeping in mind that weight of evidence C is based on A and B (as explained at the beginning of this chapter), 38 of 73 studies have been assessed as having medium or high trustworthiness and research quality (Weight of evidence A). With regard to the relevance (weight of evidence B), 59 of the 73 studies may be considered sufficiently relevant to the systematic research mapping. All in all, seven studies were assigned a high overall weight of evidence (C), 27 a medium overall weight of evidence, and 39 a low overall weight of evidence. Thus 34 studies may be included in, and form the basis of our synthesis.

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Appendix 3 Robustness of the synthesis

This section will present an assessment of the robustness of our synthesis. This is an essential part of the narrative synthesis process, as it focuses on the potential methodological strengths and weaknesses of both the applied review method (mapping and synthesis) and methods used in the studies included. These strengths and weaknesses may directly affect the overall robustness of the synthesis, and therefore also have a bearing on the trustworthiness of the conclusions drawn on the basis of the synthesis. Thus transparency of this subject is of great importance.

The robustness level of the synthesis is determined by how studies are selected for inclusion, the weight they are given in the synthesis, and how they are theoretically conceptualised, coded, and grouped into themes: in other words, by how they are identified (search process and keyword selection), processed (screening and scope), how they are assessed (quality appraisal) and which level of research quality they display in the systematic research mapping that preceded the synthesis. After completing the systematic research mapping and establishing an evidence base of studies, issues are related to how the studies are grouped by common themes, the conceptual framework used to present the specific field of research and how results from the studies are reported.

Robustness of methods applied to the systematic research mapping

Search process
In the first stage of the systematic research mapping, keywords were extracted from state-of-the-art literature identified via preliminary searches and suggested by the review group. A list of key terms was compiled, and the review group was consulted and asked to review this list and to provide additional content if needed. This created a robust point of departure for the mapping. A full list of search strings and databases is included in (Appendix 7).

Two factors that could impact the robustness of the synthesis were investigated. Firstly, the conceptual terminology used might vary across the fields. If this were the case, the different uses of conceptual terminology would affect how studies were indexed and registered in journals and databases. However, this was not the case, so this factor did not limit the review process. The second factor that could impact robustness was if not all major journals within the field were sufficiently represented in our selection of databases. We found satisfactory coverage of major journals in the search results.

Screening and scoping
The screening phase of the systematic research mapping process was conducted on the basis

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of the pre-set scope of the systematic review as described in Appendix 7. Thus specific criteria for inclusion/exclusion were applied to each of the 9,232 unique references identified in the searches, reducing their number to 73. Since the inclusion/exclusion process was performed systematically in accordance with a clearly defined set of rules, this phase of the mapping process should not affect the evidence base, and therefore should not directly reduce the robustness of the synthesis. However, it should be noted that indirectly, any definition and choice of scope entails the delimitation of time, space, concept definitions, target group, and so on. It limits the part of the research field that is mapped, screened for inclusion/exclusion and assessed.

The foregoing also means that a different scope set for the same core subject area or research question might yield a somewhat different evidence base with equivalently different properties with regard to research quality and study foci. Therefore, when referring to the specific research field implementation, we are implicitly referring to the part of the field that falls within the scope of this systematic review. Lastly, establishing the scope is necessary, in order to reduce the vast number of studies available through researches around the globe and across time, to a number small enough to allow for systematic processing within the time span and resource pool of a review.

Quality and quantity of studies available for the synthesis
The robustness of a synthesis is closely related to the quality and quantity of the studies available for, and included in the synthesis. A synthesis based on studies whose quality has not been assessed, or that were found to be of insufficient research quality will directly affect the robustness of the synthesis, weakening it. The same is true with regard to the number of studies on which the synthesis is based. Fewer studies (even ones of high quality) increase the probability of synthesising biased results, and in many cases provides a narrower and less rich scope of knowledge.

Although the question of quality and quantity is essential, another important point to consider is that the main purpose of the systematic review is to gather and provide the best knowledge available for a specific field of research. This should be emphasised, as there are vast differences in the research between various fields, and some fields may contain much more research and/or research of higher quality than others. As a consequence, an over-rigid standard of quality and robustness may lead to the near impossibility of conducting reviews in fields with fewer published studies and/or studies of lower quality than average. If researchers were to refrain from gathering the best available evidence in such fields, there would certainly be a risk that the only available knowledge would consist primarily of single studies of relatively low quality, which may lead to a much less robust knowledge base.

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Therefore, adjusting the quality and quality standards to the properties of a specific field must be considered when conducting a systematic review. Such an adjustment was made for this systematic review, owing to the properties of research in the field.

The pool of 73 studies that remained post-screening was assessed using an adapted version of the EPPI weight of evidence approach, in accordance with recommendations for good practice put forth by Popay et al. (2006).

The quality of the final 34 studies included may be generally characterised as "medium," considering the results of the quality assessment presented in the table below. The combined weight of evidence C builds upon both A and B:

Weight of evidence

Weight of evidence	Number of studies		
	High	Medium	Low
Weight of evidence A: Trustworthiness and research quality	8	30	35
Weight of evidence B: Study Relevance	12	47	14
Weight of evidence C: Overall and combined weight of evidence	7	27	39

n=73

Studies assigned an overall "low" weight of evidence were not included in our synthesis.

Field-specific methodological challenges related to synthesis robustness

Research designs utilised in the included studies
A more in-depth look at the research designs of the studies included in the synthesis gives rise to a critical appraisal. Even though Petticrew & Roberts (2003), among others, state that relying too heavily on a traditional evidence hierarchy with RCT designs at the top and single case-studies at the bottom may be problematic, considering the actual research designs for the studies in the synthesis still seems relevant.

The frequency distribution of utilised research designs indicates that relatively strong approaches – RCT, quasi-experiments and cohort-based longitudinal studies – are used in almost half of the studies. Cross-sectional studies and mixed methods are seen in six studies. One study is a systematic review. Only seven studies are one group post-test only, or case-studies.

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With regard to robustness, the basis for the synthesis is relatively high.

Research designs used in the studies

Research design	Number of studies
Controlled experiment with random allocation to groups (RCT)	7
Experiment with non-random allocation to groups (quasi-experiment)	8
Longitudinal study: Cohort-based study	3
Longitudinal study: Other than cohort-based	0
One group pre-post-test	1
One group post-test only	1
Case-control study	0
Cross-sectional study	3
Case-study	6
Systematic review	1
Action research	0
Mixed methods	3
Not stated/unclear	0
Other	4

N=37 (multiple answers possible)

Sample sizes and sampling procedures

Going beyond the question of research design, the sample sizes of the 34 studies included in the synthesis differ significantly, ranging from one school with twelve teachers in a qualitative case-study, to a survey of 285 schools and a survey of 15,242 students, to a study including 38 schools, more than 1,200 teachers and 7,640 students. In most cases the sample sizes match the research designs and the variation in designs. The only important limitation is in the theme of management/leadership, where many studies rely on an empirical basis that are based mainly on self-reporting and other information from study participants, and many studies are case-studies that cover only a few schools, and as a consequence of this, include few school principals. There may also be a selection bias, as weak school principals may be reluctant to embark on implementation on a voluntary basis, and they may also keep their doors closed to researchers.

Focus areas in the studies

Robustness is also related to the areas of focus in the studies. As shown in the table below, specific interventions, mental health programmes, and Response to Intervention are focuses in most of the studies. Even though the specific interventions, the mental health programmes,

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and Response to Intervention studies cover very different interventions and use very different outcome measures, the implementation processes have many similarities. Management/leadership, professional development, support systems, fidelity, attitudes and perceptions, and finally, sustainability, are to a greater or a lesser extent in focus in all the studies.

Focus/foci of the studies

Focus of the studies	Number of studies
Implementation of specific interventions	21
Mental health programmes	11
Response to Intervention	7
Teacher motivation	4
Other	5

N=48 (multiple answers possible)

Context effects and the external validity of the available studies

There are some limitations to the overall assessment of the generalisability of the studies available for the synthesis within its geographical scope. This is primarily due to the unequal distribution of geographical contexts.

Countries in which the studies were carried out

In which countries were the studies carried out?	Number of studies
Denmark	0
Norway	4
Finland	1
Sweden	0
Canada	1
United States	18
Portugal	1
England	3
Ireland	1
Scotland	1
Australia	0
New Zealand	1
The Netherlands	1
Other	2

N=34

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The table shows that more than half of the studies are from the United States, where traditions of fixed curricula and relatively low teacher autonomy contrast with those in Europe, especially in the Nordic countries. This may constitute a bias, as country- and region-specific factors may influence the results of the studies, because the findings might be different if the geographical context was changed. Some degree of clustering exists, with respect to countries in Europe (9), the Nordic countries (4) and Oceania (2). However, several of the themes in the synthesis – professional development, support systems, fidelity, and sustainability – may be considered to have more or less the same influence on the thirteen countries, states, or regions.

Robustness of the methods applied to the synthesis

The robustness of the synthesis itself (beyond the systematic research mapping and the creation of the evidence base) depends on the methods applied to the completion of the synthesis, including an evaluation of the overall methodological approach, coding into themes, and the measures that have been taken to report and synthesise the results into a transparent, fully comprehensive, and systematic manner, in accordance with the primary data.

In this section the methodological choices made during the synthesis process are evaluated. We chose not to perform a meta-analysis based on the studies available for the synthesis, but instead to apply a narrative synthesis approach. This was a consequence of the great heterogeneity found across the studies concerning definitions, operationalisation, measurements, and choice of research designs related to implementation, and as a consequence of the other methodological challenges described in the previous section.

A narrative synthesis is a stronger alternative when it is not possible to aggregate data, for example, in the form of effect sizes. The narrative synthesis was conducted in accordance with common practice, as described by Popay et al. (2006).

A narrative synthesis approach (Gough et al., 2012; Popay et al., 2006) is a way of systematically synthesising the results of an evidence base, thus investigating how the knowledge gained from each individual study may be combined and compared. For this purpose the studies were coded and sorted into themes[4] in order to summarise and display the different subject areas, approaches and findings of the studies (ibid.).

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[4] A single study may be coded to more than one theme category.

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Overall assessment of the robustness of the synthesis

This section presents a summary of the main factors (strengths and weaknesses) that could impact the robustness of the synthesis, and provides an assessment of the overall level of robustness. The factors are displayed in the table below:

Strengths and weaknesses that impact robustness of the synthesis

	Systematic research mapping methods	Methods applied to studies included in the evidence base	Narrative synthesis methods
Factors that reduce robustness	• Some journals were hand-searched • Adjustment of quality assessment to fit the research field	• Vast heterogeneity with regard to choice of independent and dependent variables	• No quantitative effect aggregation possible • Less robust evidence base to build on
Factors that induce robustness	• Extensive systematic searching and robust keyword identification • Large number of identified references and very systematic screening procedures • Quality assessment by both internal and external reviewer • A relatively large number of single studies included	• The studies in the evidence base include data from 13 different countries • Some studies both have a relatively large N value	• A robust systematic approach that is consistent with common methodological standards • A strong conceptual framework • Builds on extensive systematic abstracts that ensure a solid base for synthesising findings across studies • Systematic coding of studies into themes

The table indicates that most of the factors that negatively influence the robustness of the synthesis appear to stem primarily from the methods applied in the studies included, in contrast to the methods applied and procedures used in the systematic research mapping or the synthesis. However, some reductions from publication bias should be expected, and a narrative approach to synthesis will always have an Achilles' heel in comparison with meta-analysis in regard to combining findings quantitatively.

Overall, the robustness of our synthesis is somewhat reduced by methodological challenges

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presented by the studies included in the evidence base, first of all, the often small number of management and leadership informants. This follows from the logical conclusion that a synthesis, no matter how well it is conducted, is only as robust and valid as the studies in its evidence pool. However, as mentioned in previous sections of this chapter, researchers should not refrain from conducting reviews based on such studies, as a synthesis of studies where some are methodologically challenged is still preferable to relying on knowledge gained from single studies in the same field, all things being equal. This is assuming that the best available evidence within the field (and within the scope of the review) has been identified during the review process.

Appendix 4 Characterisation of the studies included for assessment

This appendix presents a characterisation of 73 studies included for assessment of research regarding what enables the effective implementation of externally produced evidence in schools. First, we give a general characterisation of the studies included, covering topics such as in which country a study was carried out, publication year, and overall research design will be presented. This is followed by a more specific characterisation of the studies. Chapter 3 of this report presents a characterisation of the weight of evidence of the 34 studies which, in turn, is transferred over into the narrative synthesis.

General character of the studies

The research mapping was devised so as to include studies from the EU, Switzerland, Norway, the United States, Canada, Australia, and New Zealand. The table below shows how many of the 73 studies included were carried out in each country involved. As may be seen in the table, the majority of studies – 48 of 73 – are from the United States. The table also shows that the studies originate from a relatively wide geographical range. There are eight studies from the Nordic countries: one from Denmark, one from Sweden, two from Finland, and four from Norway. Three Canadian studies and three English studies are included, whereas Australia is represented by two studies. One study from each of the following countries is included: Greece, Cyprus, Wales, Portugal, Ireland, Scotland, New Zealand, and the Netherlands. Finally, one study cannot be assigned to one specific country, as it is a systematic review.

Country in which the studies were carried out

In which country was the study carried out?	Number of studies
Denmark	1
Norway	4
Finland	2
Sweden	1
Canada	3
USA	48
Greece	1
Cyprus	1
Wales	1
Portugal	1
England	3
Ireland	1
Scotland	1
Australia	2
New Zealand	1
Holland	1
Other (Systematic review)	1

N=73

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Studies published from 1 January 2011 through December 2015 have been included in the systematic research mapping. As may be seen from the table below, the studies assessed are almost equally distributed over the years 2011 to 2015.

Publication year

Publication year	Number of studies
2011	15
2012	20
2013	15
2014	10
2015	13

N=73

The following table gives an overview of the research methods used in the studies. Again, the 73 studies are equally distributed in terms of qualitative, quantitative, and qualitative and quantitative (mixed) research methods.

The overarchng research method used

The overarching research design	Number of studies
Qualitative	20
Quantitative	25
Qualitative and quantitative	27
Not stated	1

N=73

The correlation between applied research method and weight of evidence may be seen in the next table, where 39 of the 73 studies have been assessed as having a low overall weight of evidence. The majority (16) of the qualitative and quantitative studies (mixed methods) have been assessed as having a low weight of evidence, followed by twelve qualitative studies and ten quantitative studies. These 39 studies are not trustworthy with regard to transparency, results, and conclusions, and cover all three types of general research designs. Thirty-four of the studies included have been assessed as having a high or medium overall weight of evidence.

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Research method/overall weight of evidence

Research method/overall weight of evidence	High	Medium	Low
Qualitative	1	7	12
Quantitative	5	10	10
Qualitative and quantitative	2	9	16
Not stated	0	0	1

N=73

In the following table the studies are sorted according to the specific research design that was used. As may be seen, the most of the studies are case-studies (23). Ten studies are randomised control trials, twelve use a quasi-experimental approach and eight a mixed methods approach. The rest of the studies used a variety of research designs. The "Other" category includes studies that either have a design that cannot be identified as one of the other categories, or have an unclear research design, such as a survey group or comparison test.

Research designs used in the studies.

Research designs	Number of studies
Controlled Experiment with random allocation to groups (RCT)	9
Experiment with non- random allocation to groups (quasi experiment)	10
Longitudinal study: Cohort based study	4
Longitudinal study : Other than cohort based	1
One group pre-post test	2
One group post- test only	1
Case-control study	2
Cross-sectional study	6
Case-study	24
Systematic review	1
Action research	5
Mixed methods	8
Not stated/unclear	2
Other	8

N=82 (multiple answers possible)

In the next table it becomes quite apparent that the quantitative studies are assessed more highly in terms of weight of evidence. Regarding the experimental studies, fifteen have been rated as having high or medium trustworthiness, in contrast to eighteen of the case-studies that have been assessed as having low trustworthiness.

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Research design and weight of evidence

Research design/overall weight of evidence	High	Medium	Low
Controlled Experiment with random allocation to groups (RCT)	2	5	2
Experiment with non- random allocation to groups (quasi experiment)	1	7	2
Longitudinal study: Cohort based study	0	3	1
Longitudinal study : Other than cohort based	0	0	1
One group pre-post test	1	0	1
One group post- test only	1	0	0
Case-control study	0	0	2
Cross-sectional study	1	2	3
Case-study	1	4	18
Systematic review	1	0	0
Action research	0	0	5
Mixed methods	0	3	5
Not stated/unclear	0	0	2
Other	0	4	4

N=82 (multiple answers possible)

Specific character of the studies included
This section gives a more specific characterisation of the 73 studies included.

The implementation focus/foci of the studies is shown in the following table, where it may be seen that the most common focus/foci is/are implementation of specific interventions, followed by Response to Intervention and mental health programmes.

Implementation focus/foci of the studies

Focus of the studies	Number of studies
Implementation of specific interventions	45
Mental health programmes	17
Response to Intervention	23
Teacher motivation	9
Other	9

N=103 (multiple answers possible)

In the following table a general overview of the studies foci is given. Worth noticing here is that

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the majority of the studies focus on both what promotes and what hinders implementation.

Focus/foci of the studies

Focus of the studies	Number of studies
Factors that promote implementation	53
Factors that hinder implementation	39
Not specified/unclear	11
None of the codes above	1

N=104 (multiple answers allowed)

In the next table the studies have been ordered in terms of the target of the intervention. Universal school intervention is the target for a little over half of the studies, and the rest of the studies cover the other intervention areas mentioned.

Target for the intervention

Target for the intervention	Count
State wide intervention	5
Universal school	43
Whole class	12
Small group	5
Other	9
Not stated/unclear	7
None of the codes above	1

N=82 (multiple answers possible)

The following table illustrates that in 40 cases, teachers and school principals supported the intervention. Researchers and research assistants supported the intervention in 26 studies. The programme developers supported nine studies. In 36 studies, persons other than those involved in management/leadership, teaching, and programme development supported the interventions.

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Who supports the interventions

Who supports the intervention	Count
Researchers	21
Teachers	13
School leader	27
Research assistants	5
Psychologist	7
Program developer	9
Other	36
Not stated/unclear	8
None of the codes above	1

N=127 (multiple answers possible)

When it comes to discipline or curricular focus literacy and social emotional learning are predominant. The table shows that literacy account for 29 studies while social and emotional learning is in focus in 17 studies. Other focus areas are more sparsely represented.

Discipline and/or curricular focus

Discipline and curricular focus	Count
Literacy	29
Mathematics	9
Language	2
Science	5
ICT/Technology	5
Art	1
Cross-curricular	4
Social studies	3
Social emotional learning	17
Anti-bullying	7
Teacher training	1
Other	6
Not stated/unclear	8
None of the codes above	1

N=98 (multiple answers possible)

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Measurement of implementation outcome is most often immediate (N=21) or took place over the long term (N=25). Measurement over the short term took place in sixteen studies. It is remarkable that for sixteen studies there is no information concerning when their impact was measured.

When is the impact measured

When is the impact measured	Count
Immediate	21
Short term	16
Long term	25
Other	13
Not stated/unclear	16
None of the codes above	2

N=93 (multiple answers possible)

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Appendix 5 Characterisation of the studies in the synthesis

This appendix gives an overview of the studies included in the synthesis, regarding what enables the effective implementation of externally produced evidence in schools. First, a general characterisation of the studies will be given, where topics such as the country in which the study was carried out, publication year, and overall research design will be presented. This is followed by a more specific characterisation of the studies.

General character of the studies included

The research mapping was devised in order to include studies from the EU, Switzerland, Norway, the United States, Canada, Australia, and New Zealand. In the table below it can be seen in which country the 34 studies comprising the synthesis were carried out. As can be seen in the table, the majority of studies, 19 of 34, are from the United States. Furthermore it shows that the studies originate from a relatively wide geographical range. There are five studies from the Nordic countries: one from Finland, and four from Norway. The studies include three from England, and one each from Canada, Ireland, Scotland, New Zealand, and the Netherlands. Finally, two studies cannot be assigned to one specific country, since they either present data from more than one country or the study is a systematic review.

Country in which the studies were carried out

In which country was the study carried out?	Number of studies
Denmark	0
Norway	4
Finland	1
Sweden	0
Canada	1
USA	19
Portugal	1
England	3
Ireland	1
Scotland	1
Australia	0
New Zealand	1
Holland	1
Other	2

N=34

Studies published from 1 January 2011 through 31 December 2015 have been included in the systematic research mapping. As may be seen in the table below, the studies in the

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synthesis are distributed over all the years included, with the greatest number having been published in 2012.

Publication year

Publication year	Number of studies
2011	6
2012	10
2013	5
2014	7
2015	6

N=34

The following table gives an overview of the research methods used in the studies. Most of the studies in the synthesis (26) use quantitative methods, and of these, eleven studies also use qualitative methods. Eight studies are based on qualitative methods only.

The overarching research method used

The overarching research design	Number of studies
Qualitative	8
Quantitative	15
Qualitative and quantitative	11

N=34

The correlation between applied research method and weight of evidence may be seen in the table below, where quantitative studies have the highest rating of weight of evidence.

Research method/overall weight of evidence

Research method/overall weight of evidence	High	Medium	
Qualitative	1	7	
Quantitative	5	10	
Qualitative and quantitative	1	10	

N=34

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In the following table, studies are sorted according to the specific research design that has been used. As may be seen, the majority of the studies are case-studies (23). Ten studies are randomised control trials, twelve use a quasi-experimental approach and eight use a mixed methods approach. The rest of the studies use a variety of research designs. The "Other" category includes studies that either have a design that cannot be identified as one of the other categories, or have an unclear research design, such as a survey group or comparison test.

Research designs used in the studies

Research design	Number of studies
Controlled Experiment with random allocation to groups (RCT)	7
Experiment with non- random allocation to groups (quasi experiment)	8
Longitudinal study: Cohort based study	3
Longitudinal study : Other than cohort based	0
One group pre-post test	1
One group post- test only	1
Case-control study	0
Cross-sectional study	3
Case-study	6
Systematic review	1
Action research	0
Mixed methods	3
Not stated/unclear	0
Other	4

N=37 (multiple answers possible)

In the next table it may be seen that studies with a high weight of evidence are found in several of the research design categories.

Research design and weight of evidence

Research design/overall weight of evidence		High	Medium
Controlled Experiment with random allocation to groups (RCT)		2	5
Experiment with non- random allocation to groups (quasi experiment)		1	7
Longitudinal study: Cohort based study		0	3
Longitudinal study : Other than cohort based		0	0
One group pre-post test		1	0
One group post- test only		1	0
Case-control study		0	0
Cross-sectional study		1	2
Case-study		1	4
Systematic review		1	0
Action research		0	0
Mixed methods		0	3
Not stated/unclear		0	0
Other		0	4

N=37 (multiple answers possible)

Specific character of the studies included

This section gives a more specific characterisation of the 34 studies in the synthesis. The table gives a general overview of the studies' foci. In 21 cases the studies have specific interventions as their focus. Mental health programmes cover eleven studies, and Response to Intervention is assessed in seven studies. Teacher motivation is the focus of four studies.

Focus/foci of the studies

Focus of the studies	Number of studies
Implementation of specific interventions	21
Mental health programs	11
Response to Intervention	7
Teacher motivation	4
Other	5

N=48 (multiple answers possible)

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In the table below studies have been ordered with respect to the target of the intervention. Universal school intervention is the target of half of the studies, and the rest of the studies cover the other intervention areas mentioned.

Target for the intervention

Target for the intervention	Count
State wide intervention	5
Universal school	20
Whole class	8
Small group	5
Other	3
Not stated/unclear	1

N=40 (multiple answers possible)

The next table illustrates that in seventeen cases teachers and school principals supported the intervention. Researchers and research assistants supported the intervention in sixteen studies. The programme developers supported seven studies. In twelve studies, persons other than those involved in management/leadership, teaching, and programme development supported the interventions.

Who supports the interventions

Who supports the intervention	Count
Researchers	12
Teachers	6
School leader	11
Research assistant	4
Psychologist	4
Program developer	7
Other	12
Not stated/unclear	2

N=58 (multiple answers possible)

When it comes to discipline or curricular focus, literacy, mathematics, and especially social and emotional learning are predominant. The table below shows that literacy and mathematics account for thirteen studies, and social and emotional learning plus anti-bullying are

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the focus of sixteen studies. Other focus areas are more sparsely represented.

Discipline and/or curricular focus

Discipline and curricular focus	Count
Literacy	8
Mathematics	5
Language	1
Science	3
ICT/Technology	1
Art	1
Cross-curricular	1
Social studies	3
Social emotional learning	12
Anti-bullying	4
Teacher training	1
Other	3
Not stated/unclear	5

N=47 (multiple answers possible)

Measurement of implementation outcomes was most often immediate (N=13), or long term (N=14). Eleven studies were considered short term. In three studies it is unclear when the impact was measured.

When is the impact measured

When is the impact measured	Count
Immediate	13
Short term	11
Long term	14
Other	6
Not stated/unclear	3

N=47 (multiple answers possible)

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Appendix 6 State of the field: Methods and their relation to theory

Methods

The state-of-the-field study started with collecting data from relevant policy documents, strategy and vision papers from the ten countries.

After studying and analysing policy documents, strategy and vision papers, the next phase was the identification of central players in the school systems, and conducting qualitative interviews. The interviews were semi-structured and covered the five areas and questions discussed below. The questionnaire was sent to the key persons in advance of the interviews.

All interviews were audio recorded, transcribed, and condensed into a portrait for each country. Each portrait started with an overview of the country school system. The portraits were sent to each interviewee for confirmation, and corrected where needed. The ten portraits are in Appendix 3.

Relation to theory

As mentioned in the theoretical chapter, studies have shown that implementation science is a multidisciplinary field, there are several components to knowledge transfer that interact in a dynamic, multidirectional process, providing bases for knowledge transfer and knowledge mobilisation.

During the process of developing a synthesis of the systematic review of the state of the evidence in chapter three, six themes were identified as central to the studies included: (1) Management and leadership, (2) Professional development, (3) Support systems, (4) Fidelity, (5) Attitudes and perceptions, and (6) Sustainability.

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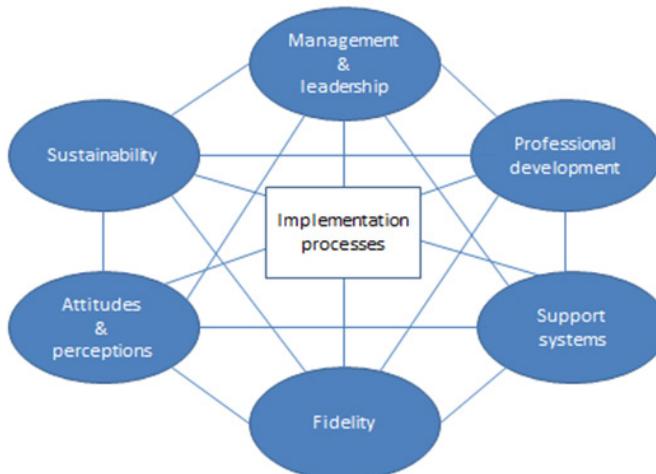
The questions used in the state-of-the-field study covered four areas:

• Policies and strategies for using the research findings in schools
• Professional development
• Initiatives that support knowledge exchange
• Experience of knowledge mobilisation in early and later parts of implementation

In relation to the theoretical model from the state of the evidence synthesis, the questions may be placed in a similar model shown below, although at country level fidelity would be covered by the selection of support systems, owing to the interviewees' limited opportunities to assess actual fidelity, and attitudes and perceptions plus sustainability would be covered by the interviewees' experiences of initial and later implementation. Therefore the theoretical model shown in the following figure may be used as a guide to the state-of-the-field analysis.

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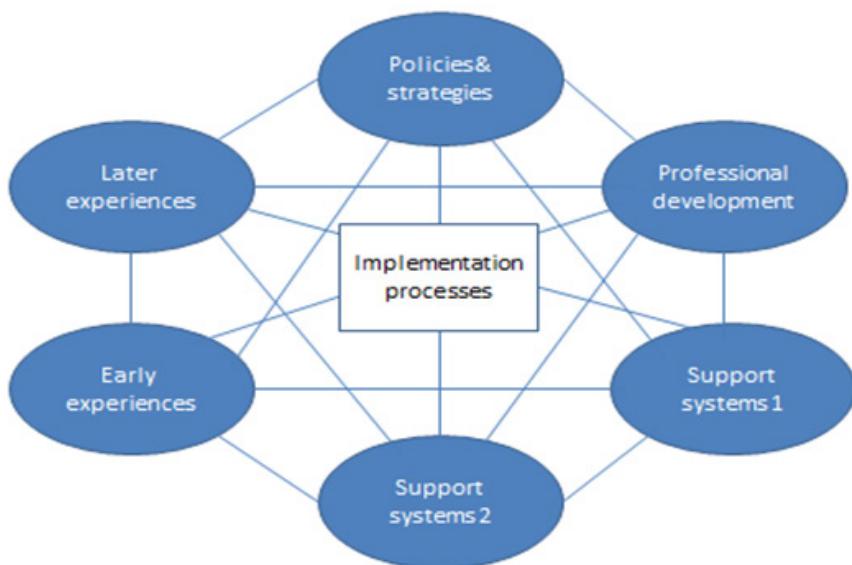
Appendix 7 State of the field portraits

Denmark

Policy framework
Denmark, with a population of approximately 5.7 million (Danmarks Statistik, n.d.), is the southernmost of the Nordic countries and a part of Scandinavia. In terms of governance, Denmark functions within a framework of a parliamentary democracy. The country has recently seen a comprehensive change in its primary and lower secondary school systems due to the national school reform of 2014. Supervision of schools is carried out by the Danish Ministry of Education (Undervisningsministeriet, UVM).

Structure of primary and lower secondary education
The Danish Folkeskole is a comprehensive school covering both primary and lower secondary education, catering to children from age six to sixteen/seventeen. Schooling starts with a mandatory year in preschool, followed by years one to nine. Primary schooling starts in the year in which the child turns six, but may be moved up or postponed for one year if necessary. In Denmark, education is compulsory for ten years, but there is no compulsory schooling, meaning that Danish parents are free to home-school their children (UVM, 2016). All children in Denmark are entitled to attend a municipal public school free of charge. Approximately 81 per cent make use of this option, while 16 per cent attend private schools receiving substantial government subsidies (UVM, 2016a). The remaining percentages are home-schooled or attend special education services. Private school types include small independent schools (friskoler), religious or congregational schools, progressive free schools, and schools with a particular educational aim, such as the Rudolf Steiner schools (UVM, n.d.).

On a national level, Danish primary schools are governed by the Folkeskole Act, which provides the overall framework for educational activity. Through this act, all municipal schools share common aims and standard requirements for educational content and school management. In practice, responsibility for the organisation and running of schools lies with the individual municipal boards. Thus it is up to the municipal boards to decide on local levels of service for public schools (as long as it is within the overall framework), and they have the opportunity to add additional educational objectives. The Folkeskole Act also allocates power to individual school boards and school principals, demonstrating that the governance of Danish public schools takes place at different levels of power. All in all, this means that Danish public schools are both relatively similar to one another due to common regulations and relatively different from one another due to freedom at the local level, allowing each school to have its own special characteristics (UVM, n.d.-a).

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Common objectives and curricula for public schools
Educational content in public schools is built on a range of binding objectives for each subject and grade level, called common objectives (fælles mål). These national goals describe what students have to learn in each school subject, and also dictate how teaching must promote the versatile development of each child. Common objectives are divided into phases in order to clarify the step-by-step development that students must demonstrate in each school subject. Incorporated into common goals are competence objectives and knowledge requirements, and special points of attention and "canonical lists" for Danish and mathematics (e.g. lists of specific authors, texts, or genres that all students must be made familiar with). All school subjects must include the following areas: IT and media, language development, and innovation and entrepreneurship. The common objectives are elaborated in curricula for each subject and for the preschool class. The ministry issues guiding curricula which are approved by the municipal boards. Schools must then develop their own curricula in which educational content and development are described, as is the process by which the school attempts to live up to the common objectives. It is important to note that the common objectives dictate what students must learn, but not how. Thus the precise educational content and methods of teaching as such are not defined, meaning that that the national curricula are instructive rather than tight (KORA, 2016).

The national school reform of 2014 reduced and simplified the common objectives, in order to ensure that they focus on students' learning outcomes rather than on the content of the school lessons. This was meant to further a better understanding of the objectives and to help schools shift to a more goal-oriented approach to teaching (ibid.).

Since 2010, Danish students sit ten mandatory national tests during their time in public primary and lower secondary school. Tests are carried out in profile areas for each of the following subjects: mathematics (years three and six), Danish, with a focus on reading (years two, four, six, and eight), English (year seven) and physics, chemistry, biology, and geography in year eight. The last year of mandatory primary school (year nine) ends with a final examination, which forms the basis for admission to upper secondary education (UVM, 2016b).

Political strategies and initiatives
Current political strategies in Denmark are largely shaped by the recent national school reform, which is why this section starts with a brief description of the reform, before moving on to other policy initiatives and key players in the educational field.

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The Folkeskole reform of 2014

In June 2013, the majority of the parties in the Danish parliament agreed on a bill designed to enhance educational quality and student performance at public schools. This new bill, known as the school reform, came into effect in August 2014, and has led to a comprehensive transformation of the public school system. The purpose of the reform is threefold, in that it aims to (1) challenge all students to reach their highest potential, (2) diminish the effects of socioeconomic status on student performance, and (3) enhance the wellbeing of children and inspire trust in the public school system through an increased respect for professional knowledge and practice. Also included in the reform are investments in in-service training and knowledge mobilisation among teachers and pedagogues, with the aim of increasing teaching competence in all school subjects and qualifying teachers to make use of new research findings and work with classroom management and alternative ways of teaching. In-service training is also provided for school principals in order to enable them to set educational goals and follow up on development initiatives (Undervisningsministeriet, 2014; Danish Ministry of Education, 2014).

Forum for the Coordination of Educational Research (Forum for Koordination af Uddannelsesforskning)

As mentioned above, the use of research as part of educational practice is addressed in the school reform through funding for in-service training of teachers and other school practitioners. Another means of furthering the use of research in schools is the development of policy-level initiatives, which mainly take place under the auspices of the Ministry for Children, Education and Gender Equality and the Ministry of Higher Education and Science. One such initiative is the creation of the Forum for the Coordination of Educational Research as part of the reform bill. The Forum aims to bring together educational research suppliers (universities and university colleges[5]) and consumers (teachers and principals) in order to improve the cooperation and transfer of knowledge between sectors. Another aim is to inspire new developments in how research is disseminated and used in practice (Uddannelses- og Forskningsministeriet, 2016). In this way, the establishment of the Forum is to be seen as part of a broader movement towards making Danish educational practice more evidence-based and bringing research closer to the field of practice. One of the Forum's specific tasks has been to carry out surveys of current research and development activity on the educational field. This has resulted in two reports commissioned by the Forum, published in 2014 (DAMVAD) and 2015 (Rambøll), focused on knowledge demands, research dissemination, and evidence-based practice. In the sections that follow, these reports, along with another (EVA, 2013) commissioned by the Danish Ministry of Education in 2013, will be reviewed individually, along with the corresponding recommendations issued upon their completion.

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[5] In Denmark there are separate laws for universities and university colleges. The highest degree that can be gained at a university college is equivalent to a Bachelor's degree.

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The Danish Evaluation Institute (EVA) (2013): Challenges and knowledge needs (Udfor-dringer og behov for viden)
In this report, the various different stakeholder perspectives on the challenges faced by Danish public schools are highlighted, and the need for new knowledge on the development of educational practice is addressed. Based on statements from school principals, teachers, and other players within the school system, the following main conclusions are drawn:

- More knowledge is needed on a number of subjects, most importantly the inclusion of children with special needs and the transfer of knowledge from special educational services to ordinary schoolteachers
- Research-based knowledge must be more focused on the field of practice, and collaborative efforts between scientists and practitioners must be furthered in order to ensure a greater connection between research and practice
- On the school level, various different factors play a role in shaping the use of research evidence in educational practice. These include cultural traditions (knowledge culture), the extent of in-service teacher training, collegial cooperation and feedback, and resources

DAMVAD (2014): Mapping research on learning in daycare, primary school and transitions to upper secondary education (Kortlægning af forskning i læring i dagtilbud, grundskole og overgange til ungdoms-uddannelserne)
In 2014, the Danish consulting firm DAMVAD carried out an exercise to map research activity in the educational field with the purpose of supplying the Forum with an up-to-date image of the knowledge needs and challenges faced by research suppliers and consumers. Based on this report, the Forum issued a series of recommendations for universities, university colleges and policymakers working to improve the dissemination and use of research-based knowledge in educational practice:

- Research activity must be strengthened within subject areas of special interest to practitioners: mainly inclusion, subject-specific didactics, and school reform implementation
- There is a need for larger investments in research targeting specific challenges met by teachers and others working in the field of practice
- Research must be action-oriented and must incorporate a focus on knowledge dissemination and dialogue with practitioners
- Research suppliers must work together in order to improve research quality by increasing the specialisation and division of labour across departments and institutions
- Incentives must be provided to make the dissemination of research-based knowledge to practitioners worthwhile for individual researchers (rather than a publication system

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that privileges peer-reviewed articles in academic journals)
- International research must be included to a greater extent in Danish educational research projects, and more publications must be written in English

Rambøll (2015): knowledge dissemination analysis

In continuation of these reports, Rambøll has completed an extensive analysis of knowledge dissemination practices within the educational field, looking at both the primary stakeholders and the underlying cultural, organisational and structural factors currently shaping the way in which research-based knowledge is produced, transferred, and used. Overall, the analysis shows that the national school reform has created momentum to strengthen knowledge mobilisation in schools. However, there is still significant potential for improvement because knowledge dissemination is limited and takes place in closed circles, often in a form and in language not easily translatable to practical use. Also, coordination between public knowledge institutions is inadequate, leaving the task of disseminating research-based knowledge to private actors. In closing, four mechanisms are identified as being of vital importance to the successful transfer of knowledge from provider to consumer: (1) dissemination of research-based knowledge in order to make it practice-oriented, (2) municipal support, (3) verbal follow-up on research results and dialogues with the field of practice on implementation issues, and lastly (4) timing the dissemination of research projects to work with other key theoretical currents shaping the educational field. Based on this analysis, the Forum recommends that:

- Educational research must be directed towards subjects of concern within the field of practice
- The interaction between universities, university colleges, schools, municipalities, and other central stakeholders must be strengthened
- The dissemination of knowledge should be recognised as a vital part of good research practice that must be promoted through strategic initiatives
- The knowledge culture and tradition within primary schools should be developed to a greater degree of research awareness and use
- The interdepartmental ties within university colleges must be strengthened in order to improve the integration of research-based knowledge into the education and in-service training of teachers
- Research-based knowledge should be made more compatible with the needs of research consumers (Uddannelses- og Forskningsministeriet, 2016a)

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Resource Centre for the Folkeskole (Ressourcecenter for folkeskolen)
The resource centre is a department under the Danish Ministry of Education, focusing specifically on the implementation of research-based knowledge in primary education. Established in 2014 as part of the school reform, it works to ensure that all school development, both in policy and in practice, rests on a solid foundation of knowledge and evidence (UVM, 2015). Centre employees support the ministry in its efforts to bring new knowledge into use in local government and school practice; they are responsible for a range of collaborative efforts involving research providers and experts. The resource centre also functions as the main support system for the ministry's corps of learning consultants (læringskonsulenter), who carry out the important task of applying research into educational practice. The learning consultants are usually trained teachers or pedagogues, school principals, or municipal managers working part-time in regular employment and part-time as learning consultants, travelling between the ministry, local schools, and municipalities in order to provide support on subject-specific concerns as well as on more general topics such as the inclusion of special-needs children, educational learning centres, and school management (UVM, 2016c).

The follow-up research programme (Følgeforskningsprogrammet)
Following the implementation of the 2014 school reform, an extensive evaluation programme was established, allocating DKK 75 million to the evaluation of and research on aspects of the reform. This initiative is meant to provide inspiration for the further development of Danish schools, while simultaneously monitoring school development and reform implementation in order to ensure that central reform goals are reached. The follow-up research programme addresses eight key themes, under which data collection and knowledge development are to be carried out:

- Student perspectives on primary school life after the reform
- Teaching
- The new Folkeskole
- Skills development
- School management
- Governance and municipal initiatives
- Wellbeing
- Special-needs accommodation in the new Folkeskole

The programme is to result in a range of research and knowledge products including research reports, annual summaries, and publications directed at the field of practice, concluding with a final statement to the Danish parliament at the beginning of 2020. In addition to this,

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the ministry invites researchers, practitioners, politicians, and other stakeholders to attend an annual meeting focused on the need for further development of schools, thus making room for a close dialogue on important educational issues (UVM, 2015a).

The Nordic Lighthouse Project for Educational Research: Sharing for Nordic Practitioners (Fyrtårnsprojektet: Videndeling til brug for nordiske praktikere)

Initiated by the Danish presidency of the Nordic Council of Ministers in 2015, this project revolves around the subject of knowledge-based practice and aims to build a collaborative Nordic effort through which countries may learn from one another's experiences. In Denmark, teachers have participated in focus groups, giving their ideas on what it takes for them to be able to use research-based knowledge. The Danish Evaluation Institute (EVA) has summarised these interviews. The project will include the ongoing collection of experiences as well as meetings in a reference group entitled Nordic Forum, which will draw participants from national educational authorities, teacher, student and parent unions, educational institutions, and research providers. The Lighthouse Project runs until 2017 and is administered by the Danish Ministry of Education, with funding from the Nordic Council of Ministers (UVM, n.d.-b; EVA, 2015).

The EMU web portal

EMU[6] is a web portal for education in Denmark, giving access to a large number of educational resources and information. It is a constellation of virtual entries targeting specific user-groups. Under each entry is a range of themes, educational sequences and resources, best-practice descriptions, and news. With more than half a million users every month, EMU is widely used by teachers, school principals, and other practitioners within all educational sectors, from primary school to upper secondary school, vocational education and university colleges, as a way of locating relevant knowledge (UVM, n.d.-c). EMU's role as a key source of information was confirmed by the knowledge dissemination analysis carried out by Rambøll (2015), in which the EMU portal is frequently mentioned as a principal channel for the dissemination of educational research into the field of practice. EMU focuses on supplying content in Danish that is adjusted to fit the needs of students and teachers. This makes it a vital player in the overall development of a knowledge-based educational practice and in increasing awareness in the research sector of practitioner needs. The portal is regularly developed, and has recently been adjusted to increase the number of research dissemination activities.

In addition to the resources mentioned above, EMU includes several independent services

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[6] http://www.emu.dk

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such as SkoDa (a collection of databases), the Learning Resources Repository (a catalogue of Danish learning resources) and The Trainer (a homework service). EMU is maintained by the Danish Ministry of Education and managed by the National Agency for IT and Learning, the latter cooperating with various external editors and collaborators, including the ministry's learning consultants (UVM, n.d.-c).

Other key players
In addition to the ministry-based activities mentioned so far, important work on knowledge transfer and use is carried out under the auspices of various research institutions such as universities, university colleges, and sector and state institutions. In the next paragraphs these additional institutions will be described, in order to give a full picture of the Danish educational field.

Universities and university colleges
Denmark has a total of eight universities and seven university colleges. It was to be expected therefore that a large body of educational research emanates from these institutions. Focused exclusively on education, the Danish School of Education (DPU), organised as a department within the Faculty of Arts at Aarhus University, carries out research in a broad range of subject areas relevant to education and learning, from early childhood to adult life. Under the auspices of DPU, the Danish Clearinghouse for Educational Research, established in 2006, works to provide an overview of the best currently available knowledge regarding educational practice by producing systematic reviews and mappings of research literature aimed at practitioners and policymakers within the field. The Danish Clearinghouse also carries out dissemination activities with the aim of bringing knowledge back to the field of practice. Additionally it hosts an online evidence database[7] in which all publications from a range of international evidence organisations are registered.

The National Centre for School Research
As of August 2016, a new national research development initiative entitled the National Centre for School Research (Nationalt Center for Skoleforskning) was established as a collaborative effort involving Aarhus University, Aalborg University, and VIA University College with the aim of strengthening national research on quality and development in daycare and primary education, an aim that reflects the need for a more coordinated educational research field. One of the centre's goals is to create strong links with the field of practice in order to diminish the distance between educational research and educational practice. To start with, Aarhus University will supply funding and project activities representing around DKK 65

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[7] http://edu.au.dk/forskning/omraader/danskclearinghouseforuddannelsesforskning/evidensbasen

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million over the first five years, with VIA University College also adding funds (Aarhus Universitet, 2016; Aarhus Universitet, 2016a).

The Danish National Centre for Social Research (SFI)
SFI is a sector research institution under the Ministry of Social Affairs that carries out research and commissioned projects in a range of areas, including welfare state policy. It has an annual budget of more than DKK 100 million, of which around DKK 70 million is allocated to research and evaluation (SFI, n.d.).

The Danish Evaluation Institute (EVA)
EVA is an independent state institution under the Ministry for Children, Education and Gender Equality. It carries out evaluations at all levels of the educational system, from daycare through primary school to upper secondary and tertiary education (EVA, n.d.).

The Danish Institute for Local and Regional Government Research (KORA)
KORA is an independent institute under the Danish Ministry for Social Affairs and the Interior, conducting analysis and research on key regional and local government areas such as children and young people, the labour market, and education (KORA, n.d.).

Economics and funding
Following the implementation of the 2014 national school reform, funds have been allocated through the budget law to various projects involving the use of research-based knowledge, with the aim of fostering the increased application of the best available evidence in policy and practice. Investments have also been made in the area of in-service training and knowledge mobilisation among teachers and school principals. In addition to these public investments, the A. P. Møller Fund has provided an extraordinary grant of DKK 1 billion intended to improve teacher excellence in public schools (A. P. Møller Fonden, n.d.).

Teacher education programme
The structure of the Danish teacher education programme was reformed in 2013, which means that the first class of student teachers following the new system has yet to graduate. The teacher education reform was driven by a political interest in strengthening the use of research-based knowledge and evidence in teacher education, and a need to increase the attractiveness of the teaching profession. In connection with the reform, funds were set aside for research projects at university colleges aimed at strengthening the evidence base of the teacher education programmes. There is also an ongoing effort to attract lecturers with PhD degrees to the teacher education programme.

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Overall, there is only one form of teacher education in Denmark, which means that all providers follow the same general structure and goals, although this does allow for a variety of educational profiles (such as a focus on sport, music or special needs education) (Læreruddannelsens Ledernetværk, n.d.). It takes four years to become a teacher; on completion, students earn a Bachelor of Education degree. In Denmark, teacher education is offered at seven university colleges across the country. The concept of university colleges is relatively new and was implemented in 2007 to strengthen the knowledge base of teacher, pedagogue, and other professional bachelor programmes. Thus teacher education in Denmark is subject to political attention and policy initiatives.

With the teacher education reform of 2013, the teacher education programme was rebuilt on the basis of sixteen cornerstones (Uddannelses-og Forskningsministeriet, 2012), four of which are of special interest in a knowledge-use context:

- **Higher demands and professionalism**: Demands on both students and teachers should be kept high by setting new goals for competence, increasing the workload, and implementing more thorough evaluation and exam practices. Teachers must base their teaching on evidence-based knowledge relevant to practice
- **The bachelor project**: All students should base their bachelor projects on concrete research or real-world problems found in school practice
- **Increasing the knowledge/practice foundations of teacher education programmes**: Teacher education programmes must rest on both a research and a practical foundation. This may be addressed partly by increasing the number of lecturers with PhD degrees
- **Relevant and targeted continuing professional development**: The cooperation between university colleges and other providers of professional development programmes and courses must be improved. University colleges must also ensure that teachers are offered additional training in subjects such as special-needs education and multilingualism. In-service teacher training must be adjusted to fit public school organisation through methods such as e-learning and on-the-job training.

The Ministry of Science, Innovation and Higher Education is responsible for the ongoing monitoring of university colleges, and an overall evaluation of the new structure of the teacher education programme is set to take place when the first class of teachers following the new system has graduated.

The ambition to build on research-based knowledge as an integral part of Danish teacher education is clearly visible in the new cornerstones. Part of this process involves establishing

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closer ties between teacher education programmes and research environments at universities and university colleges. However, the recent knowledge dissemination analysis carried out by Rambøll (2015) reveals significant potential for improvement in this area, meaning that university colleges still have work to do in order to bring research closer to their teacher education programmes.

Further teacher training: skills development and seeking new knowledge

As mentioned earlier, the national school reform of 2014 has led to the allocation of funds for skills development, with the goal of ensuring that by 2020 all teachers are specialised in the specific subjects they teach (Undervisningsministeriet, 2014: 9; Danish Ministry of Education, 2014: 19). Further teacher training is also meant to catalyse the use of research evidence in practice, showing how education is perceived as a vital channel for the dissemination and implementation of research-based knowledge. In connection with this, a PhD programme in the area of educational research has been established, with the aim of stimulating research that can improve achievement and increase student retention. These scholarships can only be applied for through a consortium of university colleges and universities, thus incentivising university colleges and universities to work together. In this way, the PhD programme has a dual effect: both establishing much-needed cooperative efforts between research institutions, and strengthening the overall production of knowledge within the field. In the 2011–2014 period, the PhD council awarded around DKK 100 million for such PhDs (Rambøll, 2015: 56).

The field of knowledge development is beset by political ambition and constrained by financial resources, but according to the interviewee, the preliminary statistics on teacher training activity show that not all allocated public funds are being used. This may be due to the recent school reform leading schools to focus primarily on problems of implementation, with less room left in the short term for skills-development activities. Regardless of the cause, there is potential for improvement in this area, both locally at each school and at the university college level, where closer ties must be established between the research environment, teacher education, and knowledge-development programmes. However, it is still too early to reach any general conclusions, since the follow-up evaluation programme is only now coming into effect. At the present time, changes in competence coverage may be found in comparison to 2013, and trends in the use of public funds are starting to emerge, but so far, no clear analysis of these movements is available.

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Experiences: successes, challenges, and lessons learned

In closing, the interviewee was asked to elaborate on the experiences of the Ministry for Children, Education and Gender Equality with knowledge mobilisation in primary and lower secondary education, for instance, what promotes or hinders the use of research, and what characterises the teachers' general attitudes towards using research-based knowledge in their practice. The following paragraphs highlight factors that support or hinder the use of research in Danish public schools. Finally a status update is presented on the work done so far in increasing knowledge dissemination and implementation.

The knowledge dissemination analysis carried out by Rambøll (2015) provides an image of factors that serve to promote the use of research evidence by school practitioners. The analysis shows, for instance, how teachers primarily gain new information from colleagues. Among school staff, school principals, and resource personnel, such as specialised teachers (teachers with an additional role as counsellor to other teachers concerning specific school subjects) are most active in searching for and demanding research-based knowledge. The analysis also shows that specialised teachers are important catalysts for spreading research-based knowledge at schools, and therefore are worth investing in when designing public school strategies. Overall, school principals and municipal actors are able to positively affect the use of research-based knowledge through organisational strategies such as the increased use of specialised teachers and learning teams and communities, and by imposing formal demands on teachers to include research in their teaching practice.

Turning to the suppliers of research, universities and university colleges have an important role in improving both the amount and the form of research-based knowledge directed at practitioners. Currently, research moves in rather closed circles, with few external exchanges between sectors, in addition to internal exchanges among different parts of the same institution. Also, research is often not published in a form suited to the needs of school practitioners. For research evidence to become more applicable to practice contexts, it must go through a process of remediation in which the content is translated into a more action-oriented, concrete form that makes it easier to use in school practice. The analysis shows that publishing companies manage to stimulate the use of research-based knowledge by dissemination and by inviting practitioners into the knowledge development process. By so doing, they have promoted the use of research within the field of practice; this therefore indicates that in order to support knowledge implementation in school, we must take account of the way in which knowledge is being produced.

With regard to hindering factors, the report by DAMVAD (2014) points to a lack of research-ba-

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sed knowledge in some of the subsidiary school subjects taught at public schools in Denmark. A lot of research is focused on two primary school subjects, Danish and mathematics, leading teachers to call for additional knowledge on subject-specific didactics, for example, that which is relevant to teaching foreign languages or physical education. Another factor being mentioned is the lack of time for teachers to find, read and discuss research-based knowledge, and how to apply research to everyday teaching practices.

The knowledge dissemination analysis (Rambøll, 2015) concludes that the use of research-based knowledge has gained momentum and become a municipal priority. However, there is still some way to go in terms of the implementation of research into practice. Currently, teachers' use of research-based knowledge is not a formal demand, meaning that it is not directly required through the legislation. It is more a kind of general objective that is accomplished through softer legislative tools and support systems, whereby municipal leaders and school principals receive support for developing strategies for using research-based knowledge and developing a knowledge-based school culture. The national school reform of 2014 established a framework within which it is possible to work on building municipal and school capacity, with various support systems available, such as skills-development programmes and learning consultants.

In closing, it is important to note that all the reports requested by the Danish Ministry of Education have shown a teaching profession and an overall school system very positive about using research-based knowledge in practice. Several barriers to the use of research may be identified, and it is clear that implementing an evidence-based teaching practice is no simple task, but the overall impression is that Danish teachers are willing to use research in their teaching practice.

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England

Policy framework

England is the largest and most populous of the constituent countries of the United Kingdom, with a population of approximately 54 million (Office for National Statistics, 2016). Education and education policy in England are overseen by the Department for Education and Department for Business, Innovation and Skills. Schools are responsible for implementing policy, and are managed locally by local government authorities, or academy trusts in the case of academies and free schools.

Structure of primary and secondary education

The English educational system is divided into five stages: early years, primary, secondary, further education (FE), and higher education (HE). School is compulsory for children from the first term after a child's fifth birthday until they are sixteen, and young people must continue to participate in some form of education or training until at least their eighteenth birthday. Primary schools in England teach children between the ages of four and eleven, with some schools having a nursery or children's centre attached for younger children. At the age of eleven, most children go directly continue straight to secondary school, while some make the transition via middle schools for children aged eight through fourteen. The overall goals of primary education in England are basic literacy and numeracy, and foundational skills in the sciences, mathematics and other curricular subjects (British Council, 2016; UK Government, n.d.; UK Government, 2014; UK Government, 2016).

Primary education is divided into two stages. Most children start primary school in the Reception Class, but this is not compulsory. The rest of primary education consists of Key Stage 1, also called infants, comprising years one and two, and Key Stage 2, also called Juniors, comprising years three, four, five, and six. Teachers carry out assessments at regular intervals throughout the school year, with the last Key Stage tests taking place at Key Stages 1 and 2. The tests at the end of Key Stages 1 and 2 are taken by students in years two and six and are called national curriculum tests; they are more commonly known as SATs (ibid.). Secondary education comprises Key Stages 3 (years seven to nine) and 4 (years ten to eleven). Some schools have adopted a two-year Key Stage 3 (years seven to eight) and a three-year Key Stage 4 (years nine to eleven). At Key Stage 3, public schools teach the same national curriculum subjects as at Key Stage 2 plus the subject of citizenship. At Key Stage 4, students work towards the national qualification exams, called GCSEs. These exams are taken at the end of year eleven (at the age of 16) (ibid.). After year eleven, young people are required to continue their education or training until at least their eighteenth birthday. They

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may choose how they continue their education or training, and can choose to participate through full-time education, a job or volunteering combined with part-time study, or by undertaking an apprenticeship or traineeship (ibid.).

The English primary and secondary school system encompasses a broad range of school types, including state (or public) schools, state boarding schools, and independent schools. State schools are free and usually have to follow the national curriculum. There are numerous different types of state schools. The most common types are community schools (controlled by the local authority), foundation schools (with more freedom to choose how they do things than community schools), grammar schools (run by the local authority, a foundation, or a trust, with the freedom to select students based on academic ability, often using an entrance exam), and academies (publicly funded independent state schools with more autonomy than local-authority-maintained schools). For example, academies do not have to follow the national curriculum, but must teach a broad and balanced curriculum. They may set their own pay and conditions for staff, they have more freedom concerning the delivery of the curriculum, and they may change the lengths of terms and school days.

Academies receive their budgets directly from the Department for Education. Also in the state school category are faith schools, which are mostly run like other state schools, and obligated to follow the national curriculum, with the exception of religious studies, where they are allowed to teach only their own religion. Free schools are also a type of state school, which are government funded, but not run by the local council, and not bound to follow the national curriculum. State boarding schools offer free education, but charge fees for boarding. Some are run by local councils, others as academies or free schools. These schools give priority for boarding to children with special need i.e. for boarding. Independent schools, also called private schools, charge fees for attendance. Students are not obligated to follow the national curriculum, but all independent schools must be registered with the government, and undergo regular inspections. About seven per cent of English children attend independent schools (UK Government, 2016a).

Political strategies and initiatives
Decentralisation, incentive and empowerment are key concepts in the UK education strategy: that is, less top-down and more local decision-making and project engagement. However, there is tight control of aspects of the curriculum, such as formal grammar, at the primary level. Schools with a high percentage of disadvantaged children receive additional funding, but this is not micromanaged in such a way as to require schools to utilise a specific method or programme. The government promotes the use of evidence-based knowledge in social policy

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through a broad range of initiatives. One of these is the establishment of a network of seven What Works centres operating a range of policy areas (UK Government, 2015). One of these is the Education Endowment Foundation (EEF), which focuses on educational achievement.

The Education Endowment Foundation
The Department for Education's biggest contribution to building the evidence base and supporting its use is the £137 million investment in the establishment of the Education Endowment Foundation (EEF).[8] The EEF was set up in 2011 and is independent of government. Its aim is to develop a robust and accessible evidence base regarding what works in education, primarily to improve the attainments of disadvantaged pupils, and to communicate what works in schools through a range of channels and resources. A key resource is an accessible summary of meta-analyses called the Teaching and Learning Toolkit.[9] Schools are encouraged to use the toolkit to inform their decisions on how to spend their pupil premium allocations. The pupil premium is additional per-pupil funding for schools, to support their work in improving the progress and attainments of disadvantaged pupils at all ability levels. It is paid directly to schools, which are held accountable for their use of the funding through the Office for Standards in Education, Children's Services and Skills (OFSTED); information in the school performance tables about the attainments of disadvantaged pupils; and a requirement to publish an online statement about the use and impact of their funding. Therefore, schools make their own decisions and are expected to justify their choices by referring to references in an evidence base.

In June 2015 the National Audit Office published a report on funding for disadvantaged pupils (National Audit Office, 2015) that showed that 64 per cent of school principals now use the Teaching and Learning Toolkit to inform their decisions on pupil premium funding, compared to 36 per cent in 2012. The Teaching and Learning Toolkit currently holds summaries of over ten thousand research studies from the United Kingdom and around the world, covering 34 topics, each summarised in terms of their average impact on student attainments, the strength of the evidence supporting them, and how much it would cost to implement them.

The EEF funds a range of projects aimed at improving the attainments of disadvantaged pupils, and evaluates their impact rigorously. Up to February 2016, the EEF awarded £65 million to 115 projects that involved over 700,000 pupils in over 6,200 schools across England. It has also published 45 individual evaluation reports on EEF-funded projects. The EEF's programme of rigorous evaluation of what works and the use of quantitative

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[8] https://educationendowmentfoundation.org.uk
[9] https://educationendowmentfoundation.org.uk/evidence/teaching-learning-toolkit

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methodologies is helping to increase the amount of robust research, and higher education and other institutions are being challenged to grow their capacity to undertake more quantitative research in education. Through the Teaching and Learning Toolkit and clear actionable guidance (e.g. Making Best Use of Teaching Assistants), the EEF are also helping to improve access to, and the synthesis of, educational research. To address the gap in evidence surrounding knowledge transfer or mobilisation, the department recently made an additional £1 million grant to the EEF to fund pilot tests of approaches to improving links between research and teaching practice. Projects are being led by schools, higher education institutions and others in the education sector:

- **Research Champion** (Ashford Teaching Alliance): Research Champion was a project that worked with five primary and secondary schools to increase the awareness, understanding, and use of research in the classroom through symposia and brokering. This project ran for one academic year (2014/2015) and was evaluated in May 2016 (Education Endowment Foundation, 2016)
- **Research into practice** (Rochdale Inspirational Professional Learning Community Network): A CPD (continuing professional development) Teacher Leader that worked with a network of ten primary schools to increase the use of, and understanding of evidence-based interventions. This project also ran for one academic year (2014/2015) and was evaluated in 2016 (Education Endowment Foundation, 2016a)
- **Research Leads Improving Students' Education** (the RISE Project): This project, led by the Huntington School, is designed as an RCT involving forty secondary schools in which appointed "research leads" operate through a structured school improvement process involving external research and evaluation. The project started in June 2014 and will report in autumn 2017 (Education Endowment Foundation, 2016b)
- **Research learning communities** (Institute of Education): This project, too, is designed as an RCT involving more than one hundred schools that are testing whether opinion leaders and senior leaders, coming together in research learning communities, can promote and embed evidence use. This project started in June 2014 and will report in spring 2017 (Education Endowment Foundation, 2016c)
- **The Literacy Octopus: Communicating and Engaging with Research** (Communications Trial): In this project different approaches are being actively trailed in 600 schools and passively trailed in 13,000 schools. The project started in May 2014 and will report in summer 2017 and spring 2018 (Education Endowment Foundation, 2016d). The project is being delivered by a number of organisations, such as the Institute for Effective Education, Campaign for Learning/Teaching How2s, Centre for Evaluation and Monitoring, Durham University, and NatCen and ResearchED.

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Other initiatives

The Department for Education has spent much time and resources on understanding the national and international evidence base of the relatively complex area of knowledge mobilisation. In 2013 Dr Ben Goldacre published a report for the department (Goldacre, 2013) in which he described what an evidence-based teaching profession might look like, and the challenges related to the production of and access to robust educational research. Following that report the department held conversations with key experts nationally and internationally, to build a fuller picture and to begin to consider some potential policy options. The report prompted the above-mentioned ResearchED, a series of national conferences organised by a teacher for teachers, researchers, and policymakers to promote evidence-based teaching.

Teaching schools

The government has helped to establish a network of teaching schools that help schools to improve and also help support the development of a self-improving system. Teaching schools are outstanding schools (rated by OFSTED, the inspectorate) that work with others to provide high-quality training and development to new and experienced school staff. As of February 2016 there were 538 alliances, made up of 689 teaching schools. Research and development is one of six priorities for teaching schools.

Teaching schools help the schools within their alliance undertake school-based inquiry projects and support their engagement with and use of research evidence (UK Government, 2016b). Teaching schools were evaluated by a research team from Nottingham University in 2015 (Gu et al., 2015). The Department for Education also has a series of more informal collaborations with higher education institutions and research funders to raise the profile of the use of evidence to inform teaching practice, to help organise debates, and to support a seminar series. The department has also published research questions that set out the government's research priorities by policy area, to help ensure that improvements to education and children's services are informed by evidence (UK government, 2014a). The aim of this is to encourage researchers, sector organisations and practitioners to debate what evidence is needed and how it may be used, and to inspire new research.

Closing the Gap: Test and Learn

An additional initiative set up by the Department for Education is the "Closing the Gap: Test and Learn" scheme. This is a £4 million initiative that ran over two academic years (2013/2014 and 2014/2015) using quantitative methodologies (RCTS) to test seven interventions and develop capacity in understanding the wider evidence base, using it to inform practice and to allow them to evaluate their own practice. The trials focused on interventi-

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ons chosen by schools. Through the teaching schools network, this initiative involved 800 schools in England, exposing them to these research methods and actively involving them in determining the research questions. The Closing the Gap initiative was evaluated in 2016 (National College for Teaching and Leadership, 2016). Additionally, since January 2015, fifty of the schools have been conducting small-scale trials using experimental research methods to test their own classroom interventions. The project reports were published in 2016 and are available on the government's website.[10]

Economics and funding
The Department for Education does not directly finance or subsidise the use of research in primary schools, however, as mentioned above, the Education Endowment Foundation is funding some projects that support research use in primary (and secondary) schools, and teaching schools have also received additional funding for research and development projects such as "Closing the Gap: Test and Learn" funding.

In England a range of organisations fund and otherwise influence educational research, including the Economic and Social Research Council (ESRC), the Wellcome Trust, the Nuffield Foundation and the Educational Endowment Foundation (EEF). Their work and activity support evidence-based teaching (EBT) to varying extents. The Department for Education also works with some of these organisations.

Wellcome Trust
The Wellcome Trust[11] is a global charitable foundation, mostly providing grants to scientists undertaking medical research in the United Kingdom. However, the Trust has a growing interest in improving science teaching in particular (and supports the National Science Learning Centres) as part of its objective of ensuring an adequate supply of researchers over the long term. The Trust is also investing in research in education (via commissions), and has interest in informal science learning. The Wellcome Trust is co-funding a project with the EEF on neuroscience-based interventions. They have a broader interest in EBT and support more teaching to be informed by evidence. The Trust also supported the establishment of the Education Media Centre, which seeks to improve the reporting of evidence in education and to provide journalists with access to, and contact with researchers. The Department for Education has established a relationship with the Wellcome Trust through their funding for the National Science Learning Centre.

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[10] https://www.gov.uk/government/publications/closing-the-gap-test-and-learn
[11] https://wellcome.ac.uk

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Nuffield Foundation

The Nuffield Foundation[12] is a charitable trust established to improve social wellbeing by means of funding research and innovation in both education and social policy. They also work to increase the amount of research done in both science and social science. In 2011/2012, 27 per cent of the total £10.1 million grant funding was spent on education [last known figure]. Nuffield have four grant programmes that are open to applications, and they relate to children and families, civil law, and education. In their work with education, they aim to influence education policy and practice, ensuring that all young people develop the understanding and skills required to play an informed role in society. The Nuffield Foundation supports a small amount of educational research and is keen to encourage robust quantitative studies. They are leading a partnership with the ESRC and the Higher Education Funding Council for England in a new programme to promote a step-change in quantitative methods training for UK social science undergraduates, Q–Step. This seeks to create long-term and sustainable change in how universities teach undergraduates in social science disciplines other than economics, using quantitative methods and skills to explore disciplinary issues.

The Economic and Social Research Council

The ESRC[13] is the research funding council and largest organisation that funds research on economic and social issues. It receives the majority of its funding from the Department for Business Innovation and Skills (BIS), and is managed as a Non-Departmental Public Body, but at arm's length. In 2012/2013 it received £189 million from BIS and £22.9 million from other organisations (often through partnerships with other government departments or research bodies) [last known figure]. The ESRC funds research and PhD studentships in eighteen social science disciplines from geography to psychology. In 2012/2013 over £357 million was invested (committed over a number of years) in major research projects, of which £3.4 million was awarded to the targeted initiative on sciences and mathematics education (TISME). A further £28 million was awarded to higher education institutions for research grants, but only two of these were awarded to Education [last known figures]. ESRC do not set, or have, research priorities based on discipline. For a number of years the ESRC has encouraged researchers to consider the impact of their research in their applications for funding, requiring a statement of how they envisage its impact as part of the application process. This is supplemented with ESRC Celebrating Impact prizes, which offer winners £90,000 of funding in six categories to reward and incentivise researchers who have an impact on practice or policy. More specifically, in the field of education ESRC funds a post with the EEF to focus on understanding more about how research may impact practice.

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[12] http://www.nuffieldfoundation.org
[13] http://www.esrc.ac.uk

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Teacher education programme

In England the National College for Teaching and Leadership accredits organisations such as schools and universities to offer initial teacher training (ITT) programmes leading to the award of qualified teacher status (QTS). The length of the teacher education programme in England depends on which training course is chosen and the trainee's subject, qualifications, experience, and where they want to train.[14] For postgraduate ITT courses, you need to have a first degree from a UK institution of higher education or an equivalent qualification.

The routes into teaching follow the following university-led and school-led courses:

- **University-led postgraduate training**: A postgraduate certificate in education (PGCE) can be undertaken either full-time or part-time over one or two years, respectively. Training includes courses at the university or college applied to, working with other trainees, and being taught by university staff. Also, a minimum of 24 weeks must be spent at a placement school (Department for Education, n.d.).
- **University-led undergraduate training** generally takes three to four years of full-time study, depending on the number and length of school placements undertaken. Some may take one to two years if as student already has undergraduate credits from previous studies. Three types of degrees lead to QTS: most of these tend to be in primary schools, although secondary-level options are available:
    - A Bachelor of Education (BEd) degree concentrates on teaching, learning, and related academic principles
    - Bachelor of Arts (BA) and Bachelor of Science (BSc) degrees with a QTS focus more intensively on providing specialised knowledge in students' chosen subjects, but also emphasise the skills needed to pass on that knowledge in the classroom
    - Bachelor of Science (BSc) and masters (MA) degrees with opt-in QTS: Students start on a non-ITT-based BSc in their chosen subject, but have the option of incorporating QTS in their third and/or final year of study. Students on these courses graduate with a BSc or MA in their subject and QTS (Department for Education, n.d.-a).
- **School-centred Initial Teacher Training (SCITTs)**: Training for graduates generally lasts a year. Networks of schools that have been approved to run school-centred courses are known as SCITTs. They provide practical, hands-on teacher training, delivered by experienced, practising teachers based in their own schools or a school in their network. "SCITT" is also a type of school-led course, similar to the non-salaried School Direct option (Department for Education, n.d.-b).

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[14] ITT providers may set additional requirements when looking at educational qualifications, such as A-levels, degrees, NVQs and work experience, to decide whether it would be appropriate for them to train someone to teach their chosen subject.

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- **School Direct (non-salaried)** training for graduates generally lasts a year. This school-led option offers practical, hands-on training and education based in schools across the country. School Direct courses are designed by groups of schools – in partnership with a university or SCITT – based on the skills they are looking for in a newly qualified teacher (Department for Education, n.d.-c).
- **School Direct (salaried)** courses normally take a year to complete and are aimed primarily at graduate career-changers. For this school-led option, trainees are selected by the school or partnership of schools to which they applied, in partnership with a university or SCITT. Schools recruit the trainees, who are paid as unqualified teachers at the school at which they are based (Department for Education, n.d.-d).
- **Teach First** is a two-year programme for ITT and leadership development. Teach First is a charity that trains high-achieving graduates to be effective teachers and principals at schools and aims to raise levels of pupil attainment at challenging schools (Department for Education, n.d.-e).

There are also a few additional options that offer ways to gain qualified teacher status (QTS), depending on professional or academic background:

- **Troops to Teachers**: fast-track-two-year courses that are aimed at undergraduate Service leavers and lead to QTS and a degree qualification (Department for Education, n.d.-f).
- **Researchers in Schools**: a two-year mathematics and physics course that offers bespoke, salaried teacher training for high-achieving candidates who have completed, or are finishing, their doctorate (Department for Education, n.d.-g).
- **Assessment Only**: If you are an experienced teacher with a degree, you may achieve QTS without having to do any further training. Assessment Only allows you to demonstrate that you already meet all the standards for QTS (Department for Education, n.d.-h).

In primary schools, teachers teach a diverse curriculum that touches on a wide range of subjects, ranging from mathematics and science to literacy, history, performing arts, and physical education. One may also train to qualify as a specialist with an extra focus on certain subjects. In secondary schools the teachers specialise in teaching one or two subjects (subject taught from Key Stage 3 to A-level). All accredited providers must ensure that they prepare all trainee teachers to teach within one of the following age ranges: ages 3–11 (primary), ages 7–14 (middle), ages 11–19 (secondary).

The government sees promoting evidence-based teaching as a way to improve the quality of teaching and to support and empower teachers as professionals. In maintained schools (that

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is, public schools maintained by a local authority) teachers' performance is assessed against the Teachers' Standards, which includes references to research use. That means that through the Teachers' Standards, teachers are expected to engage in evidence-based teaching, despite there being no explicit mention of it. To some extent, evidence-based teaching is embedded within three of the standards:

- **Standard 5: Adapt teaching to respond to the strengths and needs of all pupils**. This includes "have a secure understanding of how a range of factors can inhibit pupils' ability to learn and how best to overcome these"
- **Standard 6: Make accurate and productive use of assessment**. This includes "use relevant data to monitor progress, set targets, and plan subsequent lessons"
- **Standard 8: Fulfil wider professional responsibilities**. This includes "take responsibility for improving teaching through appropriate professional development, responding to advice and feedback from colleagues" (Department for Education, 2011).

The use of evidence is at the heart of the Department for Education's new standard for teachers' professional development (Department for Education, 2016a), which describes effective practice in professional teacher development. According to this new standard, effective professional teacher development should be informed by robust evidence and expertise, which may come from a range of sources. In particular, effective professional development:

- Develops practice and theory together
- Links pedagogical knowledge with subject/specialist knowledge
- Draws on the evidence base, including high-quality academic research, and robustly evaluated approaches and teaching resources
- Is supported by those with the expertise and knowledge to help participants improve their understanding of evidence
- Draws out and challenges teachers' beliefs and expectations about teaching and how children learn (Department for Education, 2016b: 8)

The ITT criteria supporting advice also refers to the "use of evidence and research to inform teaching" as something to possibly be included in the content of ITT programmes (Department for Education, 2016: 17). The ITT criteria are statutory guidance that OFSTED uses in their inspections. The supporting advice offers advice on the criteria that assist ITT providers, and OFSTED.

Secretary of State for Education appointed Sir Andrew Carter to lead an independent review

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of the quality and content of ITT. His report (Carter, 2015) found that although the system is operating well overall, there is variability in the content of ITT courses in England, including in evidence-based teaching. Carter believes that ITT should instil in trainees the importance of pupil progress. To achieve this, he feels it is critical for ITT to instil an evidence-based approach, it should teach trainees why engaging with research is important and build an expectation of, and enthusiasm for teaching as an evidence-based profession. Carter stressed that new teachers need to be taught how to become intelligent consumers of research; this means teaching them where and how to access research findings, how to interpret and challenge research, and how it may be applied in practice. In his report, Carter points out that trainees need to be explicitly taught how to reflect on practice, to be able to analyse what has gone well and less well in a lesson. This involves teaching trainees how to effectively and analytically observe in the classroom. High-quality mentoring and structured school experiences are important for facilitating this. Carter's report also included an example of good practice – he believes that universities may play an important role in supporting trainees in becoming teachers who take an evidence-based approach. However, best practice is when school-based trainers are also actively engaged with research and evidence-based teaching (Sahlberg et al., 2014), for example, where mentors actively demonstrate an engagement with research.

Further teacher training: skills development and seeking new knowledge

In England there are no expectations regarding further training of teachers. In maintained schools there is, however, a tradition of five non-teaching days each school year. These are commonly called INSET days (in-service training days). The purpose of these days is determined by schools and their individual needs, and the providers of these INSET days range from internal staff-led sessions to external providers such as charitable education organisations and education consultants.

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Finland

Policy framework

Finland is a parliamentary republic with a central government. At the local level, Finland is divided into some three hundred municipalities which are self-governing entities and, under Finnish law, have the right to manage on their own affairs. Finland numbers some 5.4 million people, the majority of which is concentrated in the small southwestern coastal plain. Most people live in towns and cities, with more than one million living in the Greater Helsinki Metropolitan Area alone. There are two official languages in Finland, Finnish and Swedish, and approximately five per cent of students in basic and upper secondary education attend a school where Swedish is the language of instruction (Finnish National Board of Education, 2012).

In Finland the national education administration is organised at two levels. The Ministry of Education and Culture is responsible for preparing educational legislation, both strategic planning and all necessary decisions, and it is responsible for the education budget. The Finnish National Board of Education (FNBE), which is a national development agency and subordinate to the ministry, takes care of the development of educational objectives, content, and methods according to the performance agreement with the Ministry of Education and Culture. The FNBE is responsible for pre-primary education and basic education, among other educational areas, and for determining the national core curriculum. The FNBE also assists the ministry in the preparation of educational policy decisions. Local administration of education is the responsibility of local authorities, most commonly municipalities or joint municipal authorities, which make the decisions on funding allocation, local curricula, and recruitment of school personnel. Local authorities determine how much autonomy is passed on to schools.

The current educational legislation in Finland is based on the principle of decentralisation. Self-evaluation by education providers combined with external evaluations by national expert bodies form the basis of quality assurance. Thus school inspections were abolished in Finland in the early 1990s and replaced by the rationale of management by means of information, support, and funding. At a governmental level this means that local authorities have a lot of autonomy in their provision of education. Thus local education providers and teachers play a central and important role, because the entire educational system relies on trust in and proficiency of teachers rather than government control (Finnish National Board of Education, 2013a, Finnish National Board of Education, 2012).

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Structure of primary and lower secondary education
The Finnish school system follows a structure of early childhood education, pre-primary education, basic education, and then upper secondary and beyond. As of 2015, pre-primary education has become compulsory in Finland, generally when children reach the age of six. Pre-primary education is followed by basic education, which has a nine-year syllabus. Thus education in Finland is compulsory between the ages of six and seventeen.

Pre-primary education is provided by daycare centres and schools in which children learn basic skills and knowledge from different branches of learning, with a focus on learning through play. Basic education takes place within a single structure with no division into primary and lower secondary education, and it starts in the year when the child turns seven. For most school subjects instruction is usually carried out by the same teacher for the first six years, and then by subject specialists for the last three years. Basic education in Finland is focused on learning rather than testing, which means there are no national tests in basic education. Instead, students are continuously assessed by their teachers in relation to curriculum objectives, with each student receiving a report at least once a year. The grades featured in the final basic education certificate are also given by teachers.

In general, education in Finland is publically funded, with no tuition fees at any level of education. Most schools that provide basic education are maintained by local authorities, which are obligated to provide schooling free of charge for children of compulsory education age. Private education providers are licensed by the government and are under public supervision. They follow the same legislation and core curriculum as public schools and are often run by associations and societies with a religious basis, or are based on a certain language (English, Russian and German) or Steiner pedagogy. For basic education most of the students in Finland go to public schools, whereas less than two per cent of each age cohort attend private schools (Finnish National Board of Education, 2012; Finnish National Board of Education, 2008; Finnish National Board of Education, n.d.-a).

Political strategies and initiatives
In Finland there is not just one policy on or strategy for knowledge mobilisation in education. Rather, the use of research-based knowledge is deeply incorporated into the whole educational system. In addition, local autonomy in education is extensive. Local education providers therefore have a great deal of responsibility, as they not only take care of practical teaching arrangements, but are also responsible for the effectiveness and quality of the education provided.

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At a local level the Ministry of Education and Culture provides funding to a range of projects and initiatives intended to support knowledge mobilisation to primary and secondary schools. However, at present the ministry does not provide teachers with easy access to research-based knowledge through a national research database or through online platforms, for instance, nor does it in other ways filter the evidence of additional bodies of knowledge that can be effective or pass this on to school practitioners.

In Finland research-related tasks within the Ministry of Education and Culture are handled by agencies and institutes subordinate to the ministry, expert bodies appointed by the central government or the ministry, and partner organisations.

To guide basic education in Finland, the Finnish National Board of Education has developed the national core curriculum for basic education, which describes the mission and values of basic education, and it contains the objectives for teaching all school subjects and their core content.

The National Core Curriculum for Basic Education
In Finland, education management system strongly emphasises the role of the curriculum, mainly because Finnish schools do not use standardised testing to determine student success and Finland has no nationally regulated framework for teacher evaluation. Instead, teachers are responsible for the assessment of their respective school subjects, based on the objectives written into the curriculum. Therefore, the national core curriculum is regarded as a particularly important steering tool. The first national core curriculum was introduced in 1985 and revised in 1994, 2004, and again in 2014.

As mentioned earlier, Finnish local education authorities play a very important role. They are responsible not only for organising education and for providing education in accordance with education acts and decrees, but also for developing and approving local curricula that reflect decisions regarding the educational and teaching tasks of basic education and the objectives and core content specified in the national core curriculum. Thus the national core curriculum is perceived as flexible, and it functions as a framework for formulating the local curricula, rather than specifying a strict and specific scope of topics and skills students should be taught and achieve, as they progress through school. This also means that the core curriculum does not include mandated resources, and that individual schools and teachers have the professional freedom to decide on the teaching methods and materials to use in order to achieve the objectives stated in the curriculum. The same applies to the use of ICT (information and communications technology) and student assessments (Finnish National

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Board of Education, 2013b).

By the end of 2014 the Finnish National Board of Education had completed a reform of the national core curriculum for pre-primary and basic education (Curriculum Reform 2016). In August 2016 schools started to work following local curricula based on this renewed core curriculum (Finnish National Board of Education, 2015a).

The curriculum reform of 2016 emphasises the interaction between the various levels of the educational system, among other things, which is why the national core curriculum and local curricula are drawn up in open, interactive, and cooperative processes. This extensive collaboration and ongoing dialogue have functioned as a learning circle that helped to identify matters to be improved, and to find solutions that best serve teaching and learning, but also to promote stakeholder commitment to the curriculum process and to the goals set for basic education. The process of renewing the core curriculum has involved all stakeholders, such as municipalities and education providers, particularly schools and teachers, teacher-trainers, researchers, and other key stakeholders, and parents and students were also encouraged to participate in the process. In general, Finnish teachers have great opportunities to influence the development of education, at both local and national levels, as they are often represented in expert groups that are preparing education reform and new educational initiatives (Finnish National Board of Education, 2013b; Finnish National Board of Education, n.d.-c).

Central to curriculum reform 2016 are the interrelated questions of why, what, and how school can be made a better learning environment. In order to ensure that this guiding document for basic education is built on research-based knowledge, and in order to broaden the conception of good teaching beyond "traditional" desk learning to include a variety of active, constructivist, and research-based strategies, educational research and evidence of what promotes learning in school have played central roles in the recent revision of the national core curriculum (Finnish National Board of Education, n.d.-c).

Through the national core curriculum, teachers in Finland are expected to use research or research-based knowledge in their practice, as they are legally bound to follow the core curriculum. In other words, Finnish teachers are encouraged to engage in evidence-based teaching strategies, but because the core curriculum is very loose and flexible, the local education providers have the autonomy to implement this guiding document in different ways.

In short, because the educational system in Finland is to a large extent based on trust in teachers as professionals in their field, and because Finnish teachers are highly trained and

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thus have experience in conducting research, and the ability to use research and evidence in their teaching practice, they have a great deal of autonomy when doing so. Therefore, there are no enforcing mechanisms in the Finnish system, that is, teachers are not forced to use certain types of teaching practices. Nevertheless, the ideology behind the high-quality teacher education is that teachers certainly should use research and evidence in their everyday teaching practice.

The Finnish Education Evaluation Centre

In 2014 the Finnish Education Evaluation Centre (FINEEC)[15] was formed for the purpose of grouping tasks and competence related to evaluation under a clear entity, and to consolidate evaluation activities crossing educational-level boundaries. FINEEC is an independent government agency responsible for conducting evaluations related to education, from early childhood education to higher education. Importantly, FINEEC operates with an evaluation council appointed by the government, which monitors and develops the centre's operations and draws up its strategic policies (Finnish Education Evaluation Centre, n.d.-a).

According to the FINEEC website, the aims of the evaluations carried out by FINEEC are to develop education and support learning while ensuring the high quality of education. The evaluations also generate information for local, regional, and national decision-making on education, as well as development work and international comparisons. Part of FINEEC's mission is to implement system and thematic evaluations, learning outcome evaluations, and field-specific evaluations. The centre also supports education providers and decision-makers in various ways, for instance, by organising training related to evaluation and quality assurance, disseminating information about evaluation outcomes, and promoting research on evaluation. All evaluation reports are publicly available and may be downloaded from the FINEEC website.

FINEEC conducts two types of evaluations related to pre-primary and basic education: "learning outcome evaluations" and "thematic and system evaluations." Besides ensuring educational equity and high-quality teaching, both types of evaluations function as tools for informative steering and development at schools. Systematic data acquisition provides information for national and regional levels, and for teaching and education providers as well as schools (Finnish Education Evaluation Centre, n.d.-b).

Learning outcome evaluations collect information about attaining the objectives of the national core curriculum for pre-primary and basic education. In 1998 the Finnish Natio-

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[15] http://karvi.fi/en/fineec

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nal Board of Education launched national learning result evaluations that have now been transferred to FINEEC. Systematic and comprehensive evaluation enables the monitoring of student evaluation in relation to study objectives and evaluation criteria, the study of regional differences and gender-based differences and the study of students' attitudes and motivation with respect to schooling (Finnish Education Evaluation Centre, n.d.-c). An example is the evaluation of learning outcomes in Finnish and literature at the end of basic education (Finnish Evaluation Education Centre, 2015a). The purpose of this assessment was to produce reliable information on how well the objectives of the national core curriculum for basic education 2004 have been met, and on success in promoting educational equality.

Thematic and system evaluations provide information about topical education content areas with regard to education policy, forms of education and the education system as a whole, or parts of it. It is crucial to take into account the perspectives of various stakeholders, to study the phenomenon to be evaluated critically and in depth, and to get a comprehensive understanding of the evaluation target (Finnish Education Evaluation Centre, n.d.-d). An example of such an evaluation is the evaluation of learners with immigrant backgrounds within the Finnish educational system (Finnish Evaluation Education Centre, 2015b). The main questions in this evaluation concern the accessibility of support and the actualisation of this accessibility with regard to the education range for learners with an immigrant background, support at application and transitional phases, and support for learning Finnish/ Swedish and the learners' native language, as well as other subjects during their studies.

Universities and other key players

Besides the evaluation work done by FINEEC, the Ministry of Education and Culture also cooperate closely with universities in Finland, to support efforts to develop and implement education policies, programmes, and practices that are evidence-based and research-informed. In Finland, universities are publically funded but otherwise independent and autonomous bodies under the ministry. From time to time the universities do commissioned research tasks and projects for the ministry, such as background papers or various kinds of academic papers and research reports. This could be research on the effect of a specific change in legislation related to the Finnish educational system, for instance. In Finland, research units are usually attached to universities, and are thus a part of the political strategy and funded by the central government. There are a few privately funded organisations that make research available, from which the ministry sometimes commissions research, in order to get another perspective on a specific educational matter.

In general, the ministry commissions research from universities, whereas local authorities

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more often make use of research conducted by privately funded organisations or other agencies. However, on a local level, the use of expertise in incorporating educational research into school practice varies significantly in different parts of Finland, mainly because of the extensive local autonomy. However, there is a tendency for the municipalities of the larger cities to use the expertise of different agencies or consultancies to a greater extent than the smaller municipalities, but in practice there is a myriad of key players in the local educational systems. For instance, in Helsinki, which has a very extensive educational system of its own, the local authority has partnerships with several players, both public and private.

In Finland, commissioned research is publicly available, but there is no requirement that it be published specifically for teachers or practice in easy accessible and applicable formats. For instance, the ministry may try to promote their commissioned research mainly through the media, but according to the interviewee, the ministry could do more to translate research and evidence into explicit practices for teachers.

The Finnish National Board of Education
The Finnish universities are clearly central actors in making research-based knowledge and evidence available to school practitioners. However, on a governmental level the Finnish National Board of Education is also regarded a key player. As mentioned earlier, one of FNBE's most significant tasks is to develop the national core curriculum, but according to their revised strategy, FNBE also has a strong focus on reinforcing the information-based approach in teaching, and on educational administration and educational policy decision-making processes. Therefore, FNBE seeks to draw on assessment, research, and monitoring data that are both national and international in the development of education and training. Moreover, FNBE focuses on research collaboration as it engages in the exchange of information, sharing of expertise, and cross-sectoral cooperation. This means, for instance, that the FNBE is working on increasing their collaboration with a range of research institutes, and they wish to support educational development by conducting reviews and research reports, and are also involved in the international exchange of educational information through European networks. In short, FNBE seeks to build the management and support of educational providers on the basis of both national and international comparison and research data (Finnish National Board of Education 2015b: 10; Finnish National Board of Education, n.d.-d).

Economy and funding
In Finland, pre-primary and basic educations are part of the basic municipal services that receive statutory government transfers. The responsibility for educational funding is divided between state and local authorities, and the state subsidy average 57 per cent of the costs, while

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municipal contributions average 43 per cent (Finnish National Board of Education 2008: 4).

The Ministry of Education and Culture manages part of the funding for basic education, and funds areas such as voluntary additional basic education, and instruction that prepares immigrant children for basic education. The ministry also manages start-up funding for private education providers and funding for basic education organised abroad. Otherwise, the funding is not earmarked, which means the individual education provider makes the decisions on the use of central government transfers (Ministry of Education and Culture, n.d.). However, the financial autonomy of schools varies from municipality to municipality, as each municipality decides how much decision-making they delegate to schools.

Teacher education programme

Teachers in Finland are very autonomous professionally; a high level of teacher training is therefore regarded as a necessity. In general education, all teachers are required to hold a master's-level university degree. The teaching profession is very popular in Finland and has high status, and applicant numbers are therefore well above actual admissions to teacher education programmes. Becoming a primary school teacher is especially competitive, and only ten per cent of applicants are accepted into teacher education programmes (Finnish National Board of Education, n.d.-b). In Finland, the universities determine student selection criteria independently. Applicants are assessed based on their upper secondary school record, their extracurricular activities, and their score on the matriculation exam taken at the end of upper secondary school. Universities also use entrance tests to assess aspects such as academic study skills and aptitude for the teaching profession. Applicants are often observed conducting a teaching-like activity, and interviewed so that only candidates with a clear aptitude for teaching as well as strong academic performance are admitted (Ministry of Education and Culture, 2014; Sahlberg, 2010; NCEE, n.d.).

Basic education in Finland is divided into grades. Grades 1–6 are taught mainly by class teachers and grades 7–9 by specialised subject teachers. Primary school teachers major in education, whereas subject teachers concentrate their studies in a particular subject, such as mathematics, as well as didactics, which consists of pedagogical content knowledge specific to that subject. Teachers in Finland go through a rigorous academic and research-based education, which means that it must be supported by scientific knowledge, and focus on thinking processes and cognitive skills used in conducting research. Teacher education programmes in Finland normally last five to six years and may only be done at a university that offers teacher education degrees. There are no alternative ways to receive a teacher's diploma in Finland (Sahlberg, 2010).

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The academic expectations of teacher education in Finland are very high, and similar for all teachers, and teacher education programmes strongly emphasise the link between teaching and research. An important objective of teacher education in Finland is to produce teachers who are research-oriented in their daily work, who can make use of and apply the most recent research in the field of education and to the school subjects taught (Ministry of Education and Culture, 2014). using and undertaking research is certainly part of teacher training in Finland.

Further teacher training: skills development and seeking new knowledge

In Finland, continuing education is compulsory for teachers, but because Finnish schools are funded at the municipal level, professional development requirements differ by municipality. However, the government requires that teachers in general education participate in mandatory in-service training for a minimum of three days per year, funded by the municipalities, but beyond that, time spent on professional development varies widely on a national level. Similarly, the government does not regulate what types of professional development teachers engage in. Teachers participate in the three days of mandatory in-service training with full salary benefits (Finnish National Board of Education, 2013b). According to the interviewee, teachers in Finland generally consider in-service training to be a privilege, and therefore participate actively.

The state primarily funds in-service programmes, mostly in areas important for implementing education policy and reforms, but local authorities also support in-service training within their financial limits, and with financial support from the state. Education providers can also apply for funding to improve the professional competence of their teachers and other school practitioners.

In Finland, local education providers have the primary responsibility for continuing teacher education. However, the teachers themselves have also been given greater responsibility for developing their professional skills and expertise, as more attention is paid to self-motivated continuing education. Whereas some Finnish municipalities leave it up to the individual teachers or school principals to decide how much and what type of professional development is needed, others organise uniform, in-service training for all teachers. Because of the extensive local authority in Finland, the government has only a limited influence on the budget decisions made by the individual municipalities or schools. Therefore, some schools receive greater allocations for professional development and school improvement than others (Finnish National Board of Education, 2013b; Finnish National Board of Education, n.d.-b).

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As stated in the Finnish National Board of Education's strategic plan, *Learning and Competence* 2025, FNBE also works to strengthen teacher competence and to increase the effectiveness of training for educational department personnel (Finnish National Board of Education, 2015b: 7). Thus the agency is responsible for continuing education in the educational sector, and develops in-service programmes for teachers, but universities also offer a variety of in-service training for teachers. For instance, Summamutikka,[16] which is a resource centre for teaching and learning mathematics, and a part of the LUMA centre of the University of Helsinki, organises continuing professional education for teachers. The main goal of this professional development is to discover what is essential to teaching school mathematics, and to mathematics as a school subject. This in-service training is funded by the Finnish National Board of Education. According to the interviewee, the use of research and evidence is a part of the continuing education of teachers, but it is not a requirement.

While teacher education in Finland is often praised as a high-quality education, there is more variation in the in-service programme available to teachers. According to the interviewee, in-service teacher training could be better in Finland. For instance, a significant challenge is that the municipalities do not have an equal capacity to organise teachers' in-service training because of differences in the number of their inhabitants, their locations, and their economic circumstances. Smaller municipalities with difficult economic situations often have difficulty offering the same range or number of professional development opportunities to their employees compared to the large municipalities, which makes in-service teacher training unsystematic and vague.

In response to the inequality in professional development opportunities for teachers, the Ministry of Education and Culture launched the national OSAAVA programme, which ran over six years, from 2010 to 2016. The programme was funded by the ministry, and supports education providers' efforts to develop and provide more equal and uniform access to professional development opportunities to their teachers and other school practitioners. The OECD reports that the total number of educational personnel participating in the OSAAVA programme or other continuing professional development increased from 30,000 in 2010 to 70,000 in 2012 (OECD, 2013: 10).

The Ministry of Education and Culture appointed an Advisory Board for Professional Development of Education Personnel to examine and improve professional development and the changes in teachers' learning needs. Moreover, the Advisory Board has participated in the development of the OSAAVA programme, and it makes proposals for, and statements about the direction and realisation of continuing teacher education. Among other things,

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[16] http://www.luma.fi/summamutikka-en

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the Advisory Board for Professional Development of Education Personnel proposes that an entity for continuing professional development between initial and continuing education be established, to create a solid foundation for developing professional competence throughout the teaching career, as a lifelong learning path. The Advisory Board also highlights the importance of reinforcing teachers' research-oriented work, and recommends that the higher education institutions, in cooperation with stakeholders, develop long-term programmes to enhance the professional development of education personnel, and new specialised training (Ministry of Education and Culture, 2015).

Experiences: Successes, challenges, and lessons learned

In closing, the interviewee was asked to elaborate on the Ministry of Education and Culture's experiences with knowledge mobilisation in primary and lower secondary education, for instance, what promotes or hinders the use of research, and what the teachers' general attitudes are towards using research-based knowledge in their practice.

According to the interviewee it is difficult to determine the Finnish teachers' general attitude towards using research-based knowledge in their teaching practice. In his view, some teachers are certainly very enthusiastic and open-minded about the use of research and evidence, while others are not. The interviewee considers it a major task ahead in Finland to make research and evidence applicable in practice, and thereby make research results related to effective teaching strategies more tangible for teachers. According to the interviewee, on local level the lack of resources, in terms of both money and time, may also hinder the promotion of research and new ideas in schools.

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Maryland, United States

Policy framework

The United States is a constitutional federal republic in which the president, Congress, and the judiciary – the executive, legislative, and judicial branches of government – jointly exercise power reserved to the federal government, and the federal government shares authority with the state governments. There are fifty states and the responsibility for education in the United States exists at individual state level. With regard to knowledge utilisation, federal funding given to states is to be used in very specific and constrained ways. For instance, the federal No Child Left Behind and the Every Student Succeeds education acts cover federal standards and accountability regulations. Although states and local districts do have their own programmes and objectives related to knowledge utilisation, federal policies and resources, including federal funding, are crucial.

No Child Left Behind Act

In 2001 the No Child Left Behind Act was adopted by the US Department of Education. The main purpose of the act was to close student achievement gaps by providing all children in American schools with a fair, equal, and significant opportunity to obtain an education of high quality. The act also requires each state to establish state academic standards and a state testing system that meet federal requirements. Four main areas are the focus of the No Child Left Behind Act:

- Accountability: to ensure those students who are disadvantaged achieve academic proficiency
- Flexibility: Allows school districts flexibility with respect to how they use federal education funds to improve student achievement
- Research-based education: Emphasises educational programmes and practices that have been proven effective through scientific research
- Parent options: Increases the choices available to the parents of students attending Title I schools (Office of Superintendent of Public Instruction, 2011)

Regarding research and use of research in schools, the No Child Left Behind Act requires schools to rely on scientifically based research for programme development and teaching methods. The act defines scientifically based research as research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programmes. Scientifically based research that is conducted using the appropriate methods to generate persuasive and practical conclusions

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(ibid.) generates findings that are both applicable and replicable.

The Every Student Succeeds Act

In December 2015 the Every Student Succeeds Act was signed by President Obama and replaced the No Child Left Behind Act. The Every Student Succeeds Act will be fully operational in 2017/2018. The act aims to provide a long-term, stable federal policy that gives additional flexibility and encouragement to the states, the local school systems and schools to innovate, and holds all parties accountable for results (US Department of Education, 2015; US Department of Education, 2016). The Every Student Succeeds Act goes even further than the No Child Left Behind Act in encouraging the use of programmes that are based on scientifically based research. For instance, the act makes it clear that "upon receiving comprehensive support and improvement from the state, the local educational agency shall, for each school identified by the state and in partnership with stakeholders (including principals and other school principals, teachers, and parents), locally develop and implement a comprehensive support and improvement plan for the school to improve student outcomes, that includes evidence-based interventions" (The US Department of Education, 2015). The Every Student Succeeds Act continues to be an important funder of research and development, through the Institute for Education Sciences and a replacement for Investing in Innovation (i3), and some smaller funding programmes.

Example of state-level policies and resources: Maryland

Even though federal policies and resources, including federal funding, are crucial for knowledge utilisation in US education, the state departments of education manage flow-through of federal funds to districts or schools under specific regulations. Therefore, the state of Maryland is included as an example of state-level policies, strategies, and initiatives related to knowledge dissemination.

Maryland is located in the mid-Atlantic region. Its largest city is Baltimore and the state's capital is Annapolis. Maryland is one of the smallest states in terms of area, however it is also one the most densely populated states, with almost 6 million residents (US Census Bureau, 2015). For many years, Maryland public schools have been ranked among the best schools in the country by the United States' top education newspaper, Education Week. The state has managed to expand student achievement massively since the 1990s. The high school graduation rate is now over 85 per cent and the dropout rate has fallen to approximately 8%. More minority students and students with lower SES backgrounds graduate today compared to a few years back. Also, in 2013 83 per cent of children in kindergartens entered the year fully prepared for school, compared to sixty per cent in 2005 (Maryland State Education Association, n.d.).

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Structure of primary and lower secondary education

In Maryland primary and secondary education is overseen by the Maryland State Department of Education (MSDE). Education is financed by the states, but Maryland has been granted funding from the federal government to co-finance of a range of educational initiatives. MSDE's purpose is to develop and provide education for children. The Maryland State Department of Education initiates and monitors a wide range of initiatives, all of which must be research-based or research-oriented. In Maryland children are required to attend a public or private preschool (kindergarten) the school year before they enter grade 1. There are 24 local school systems in Maryland.

Political strategies and initiatives

The highest educational official in the state of Maryland is the state superintendent of schools, who is appointed by the state board of education to a four-year term of office. The Maryland General Assembly has given the superintendent and state board the autonomy to make education-related decisions, limiting its own influence to the day-to-day functions of public education. Each county and county-equivalent in Maryland has a local board of education charged with running the public schools under their jurisdiction.

As mentioned above, there are 24 local school systems in Maryland and local control is exercised by the districts. The state develops the curricular standards, which are research-based, and based on these standards the school systems develop curricula that are aligned with the standards. The Maryland State Department of Education is a policy division and its actions are therefore policy-based, but every initiative, strategy, or professional development activity implemented in the school system is required to be research- or data-based. Although the department does not itself initiate research projects, it funds some research projects and collaborates with research units. In cases where the MSDE has funded research or similar activities, the use of funds to be implemented along with research-based strategies and practices has been monitored.

Maryland State Board of Education

The Maryland state board of education's role is that of policymaker for the state's public schools, public libraries, and vocational rehabilitation services. The state board consists of twelve members appointed by the governor and they hold monthly meetings throughout the year (except in November). The members differ in background and professional experience, and a student is also a member of the board. Reviewing and approving the annual budgets two of the board's tasks. Moreover, the board sets the state's education policies and standards for pre-K to grade 12. The board is required to handle controversies arising in law

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that are brought before it. Each of the 24 school systems in Maryland has its own board of education, and the Maryland state board of education supports respect for the principle of local control of schools (Maryland State Department of Education, n.d.).

The Professional Standards and Teacher Education Board

The Professional Standards and Teacher Education Board of Maryland promotes high-quality education through standards designed to ensure that educational professionals meet threshold levels of the knowledge and skills required to prepare all students for success. The governor appoints members of the Professional Standards and Teacher Education Board for three-year terms. The 25 members are representatives from a range of associations such as the Baltimore Teachers' Union, the Maryland State Education Association, the Maryland Association of Elementary School Principals, the Maryland Association of Colleges for Teacher Education, the Public School Superintendents' Association of Maryland, the Maryland Association of Secondary School Principals and the Association of Independent Maryland Schools. The board and the state board of education share the authority to develop rules and regulations for the certification of teachers, and requirements for the preparation of teachers (Maryland State Department of Education, n.d.-a).

The Common Core State Standards

The Common Core State Standards are the instructional framework and standards on the basis of which local Maryland school systems develop their curriculum. The common core is a set of academic standards in mathematics and English-language arts/literacy. Forty-two states – including Maryland and the District of Columbia – four territories and the Department of Defense Education Activity have voluntarily adopted the Common Core State Standards. The standards were initiated in 2009 by the state school directors and governors, and in 2010, in collaboration with teachers, school principals, administrators, and other experts, they developed and published the standards as a consistent framework for teachers and educators. Teachers were involved in the common core drafting process, giving the school chiefs and governors specific, constructive feedback on the standards through the National Education Association (NEA), the American Federation of Teachers (AFT), the National Council of Teachers of Mathematics (NCTM), and the National Council of Teachers of English (NCTE), among other organisations. The state of Maryland was one of the first states to adopt the standards in reading/English-language arts and mathematics after the state board of education adopted the standards by unanimous vote in June 2010. The standards are part of Maryland's college and career ready standards, which were implemented at schools across the state in 2013–2014.

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The Common Core State Standards define the knowledge and skills students should acquire from grade K to grade 12. They are research and evidence-based, they appear clear and consistent and are aligned with college and career expectations. Moreover, they are based on rigorously researched content and the application of knowledge through higher-order thinking skills. The standards are built on the strengths and lessons of the previously existing state standards and finally, the standards are informed by other top-performing countries.

The Common Core State Standards strive to promote equity by ensuring all students are well-prepared to collaborate and compete with their peers in the United States and abroad. Unlike previous state standards, which varied widely from state to state, the Common Core State Standards enable collaboration among states on a range of tools and policies, including the development of textbooks, digital media, and other teaching materials, and development and implementation of common comprehensive assessment systems that replace existing state testing systems, in order to measure student performance annually and provide teachers with specific feedback to help ensure that students are on the path to success. Moreover, the standards enable the development of tools and other forms of support to help educators and schools ensure that all students are able to learn the new standards (Common Core State Standards Initiative, n.d.; Common Core State Standards Initiative, n.d.-a; Sadusky, 2011).

As mentioned earlier, the Common Core State Standards are not a curriculum and do not dictate how teachers should teach. Local districts choose their own curricula, which are detailed plans for day-to-day teaching, and teachers devise their own lesson plans and tailor their instruction to the individual needs of their students. The distinction is clear: the standards are what students need to know and be able to do, and the curriculum is how the students will learn it. The State Curriculum is the document that aligns the Maryland Content Standards and the Maryland Assessment Programme, and defines learning goals for what students should know and be able to do at each grade level in these content areas:

- Mathematics
- English-language arts
- English as a foreign language
- Fine arts
- World languages
- School library media
- Personal financial literacy education
- Disciplinary literacy
- STEM

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- Science
- Social studies
- Health
- Physical education
- Technology education
- MD technology literacy for students

The curriculum documents for each subject area begin with content standards or broad, measurable statements about student learning goals. Indicator statements provide the next level of specificity, and narrow the focus for teachers. The objectives provide teachers with very clear, specific information about what learning should occur (School Improvement in Maryland, n.d.).

Race to the Top
Since 2010 Maryland has been part of the federally funded Race to the Top programme, the purpose of which is to boost student achievement, reduce achievement gaps among student subgroups, turn around struggling schools, and improve the teaching profession. Race to the top is part of the federal government's American Recovery and Reinvestment Act Program, and has received federal funding of $250 million over four years. On a national level, the programme was granted $4.35 billion in 2009, to "do what works," according to President Obama, in order to continue to improve American schools. As part of the programme, the Maryland State Department of Education developed a vision of reform to:

- Revise the Pre-K-12 Maryland State Curriculum, assessments and accountability system based on the common core standards to ensure that all graduates are college and career ready
- Build a statewide IT infrastructure that links all data elements with analytic and instructional tools to monitor and promote student achievement
- Redesign the model for teacher and principal preparation, development, retention, and evaluation
- Fully implement the innovative breakthrough centre approach for transforming low-performing schools and districts (Maryland State Department of Education, n.d.-b).

Teacher education programme
Becoming a teacher in Maryland may be achieved in various ways. All US states require at least a bachelor's degree in order to teach. For certification in primary education (grades 1–6), a minimum of twelve semester hours of coursework in both mathematics and science,

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nine semester hours of coursework in both English and social studies, and 27 semester hours of professional education courses are required, in addition to a major (or 48 semester hours) in a subject area taught in primary school. In order to get certification in secondary education (grades 7–12), a major or thirty semester hours in the subject area, 21 semester hours of professional education coursework, and a supervised student teaching experience are required. For certification in speciality areas such as music or art, thirty semester hours in the relevant subject area, plus the amount of education coursework and student teaching experience required for the grade level planned to teach, and a supervised student teaching experience are required (Teach.com, n.d.).

In Maryland, teachers' use of research or research-based knowledge in their curricula is a legal requirement, which the local school system establishes on the district level. The Maryland teachers are part of the local school system, with local control, and every teacher will have a specific curriculum for every subject they teach. Finding research and research-based teaching methods, or a strategy for use in the classroom is the districts' responsibility. It is not the individual teacher's responsibility to look for, or provide research.

Maryland Approved Alternative Preparation Programs
Maryland has an alternative pathway to initial teacher certification called the Maryland Approved Alternative Preparation Programs (MAAPP) The MAAPP guidelines include standards and evaluation tools that provide a structured pathway for developing alternative teacher training programmes. Local school systems then use these programmes to help meet teacher shortages, particularly in critical areas such as science and mathematics. The MAAPP meets the same academic and pedagogical (or instructional strategies) standards as those used by traditional programmes to frame the teaching of biology and English, or special education and early childhood education. Each MAAPP partnership also undergoes a cyclical, evidenced-based peer review associated with traditional state programme approval. The entering candidate is given training in classroom instruction and classroom management intended to provide the skills necessary to begin the school year as the designated teacher. Training also includes fundamental instruction in lesson planning, student assessment, and the first of the state-required reading courses. Upon successful completion of pre-employment training, a candidate interns for a period of four to eight weeks under the daily supervision of a master teacher. The Maryland State Department of Education provides close technical assistance and advisement throughout the entire MAAPP programme, and strongly encourages partnerships to provide additional training or support to struggling candidates, or to counsel them out of the profession when necessary (Maryland State Department of Education, 2010).

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Further teacher training: Skill development and seeking new knowledge

All certified teachers in Maryland must pursue professional development continually, have individualised professional development plans throughout their careers, and complete at least six hours of course credits during each five-year certification renewal cycle. Each local school system has a continuing professional development liaison who is responsible for coordinating the course submissions and course offerings. These courses are then offered to teachers and other professional educators through the local school systems (Maryland State Department of Education, n.d.-c).

Experiences: Successes, challenges, and lessons learned

In closing, the interviewees were asked to elaborate on the Department of Education's experiences with knowledge mobilisation in primary and lower secondary education, for instance, what promotes or hinders the use of research, and the teachers' general attitudes towards using research-based knowledge in their practice.

The interviewees found teachers in Maryland schools to want the best for their students, to want to teach new curricula and to want to see student progress and to see their students learning and growing. On a daily basis, many teachers may not be able to refer to the specific research behind the particular curricular strategy assessment they are using, simply because they trust the information they have received from their district. This is not a case of teachers failing to reflect on, or being critical of the classroom strategies they apply or of specific methods or programmes used. If something is not working for them and for their students, these teachers can certainly switch to another strategy, but they will be choosing from strategies that are endorsed by their district, rather than strategies or research that they will resort to on their own initiative. The teachers trust that the strategies that their district endorses are research-based, and have shown effective results.

Another two elements that may influence the successful development of teaching in Maryland are the teacher preparation programme and the continuing professional development. It becomes very clear to anyone getting into teaching that one does not teach based on personality. Teaching is based on the curricula. Because teachers are required to pursue continuing professional development in order to keep their licences, they are forced to keep up to date on what is relevant, as research changes. It is expected that what is going on in classrooms across the state of Maryland is based on good professional development, good research, good continuing training, and good results.

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New South Wales, Australia

Policy framework
Australia functions as a parliamentary democracy, and New South Wales is one of six sovereign states and two territories within the Federal Commonwealth of Australia. The estimated population of New South Wales is 7.5 million, making it the most populous state in Australia.

In the Australian federal system there are three levels of government: federal, state (or territory), and local. Under the Australian constitution, the states (or territories) are responsible for everything not listed as a federal responsibility. This includes compulsory education, from Kindergarten to Year 12.

Structure of primary and lower secondary education
In Australia education is compulsory between the ages of five to six and fifteen to seventeen, depending on the state or territory, and the child's date of birth. According to the Education Act of 2004 (Australian Capital Territory Parliamentary Counsel, 2015) a child of compulsory education age must be enrolled at a school provider or registered for home education, and all schools must be registered with the state education department. In New South Wales almost one-third of schools are private or independent, including some nine hundred primary and secondary schools (NSW government, n.d.).

In 2014 a new national curriculum was implemented across Australia for Kindergarten to Year 12. The Australian Curriculum sets out what students should be taught and achieve, as they progress through school. However, the national curriculum is perceived as flexible, given that the New South Wales Department of Education has the power to compose its own syllabuses as long as they conform to the national curriculum. This means that the national curriculum does not include mandated resources, and that teachers in NSW schools also have the power to decide how the curriculum will be delivered and to identify their own resources and assessments for use in their teaching practice. The only mandatory assessment in NSW schools is the National Assessment Plan Literacy and Numeracy (NAPLAN) (National Assessment Program, n.d.). The Australian Curriculum, Assessment and Reporting Authority is responsible for the Australian Curriculum (ACARA, n.d.).

Political strategies and initiatives
In New South Wales there has been a lot of political interest in and focus on the principles of open data and evidence-based decision-making since 2012, in consequence of a change

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in government. This also means that there has been an effort to implement an evidence-based educational policy agenda. The Open Data Policy (NSW Government, 2013a) is a key initiative of the NSW government, which is a whole-of-government strategy of information management and data-sharing. It aims to assist agencies across the NSW government to embed open-data principles in their operations and to release high-value datasets, and it helps to facilitate implementation of best-practice open-data principles across the NSW public sector. The Open Data Policy is part of the information management framework, and was released in 2013 (NSW Government, 2013b).

As stated in the Department of Education's *Five-Year Strategic Plan 2012–2017*, the overarching priorities for education in New South Wales are: (1) high-quality teaching and leadership, (2) high expectations, closing gaps, and (3) new and better ways of doing business (NSW Department of Education and Communities, 2012). Thus all of the department's research and evaluation work may be linked to one of these high-level priorities and driving aims.

Additionally, the New South Wales Department of Education is committed to using data, evidence, and evaluation to inform school planning and practice. In 2012 the department invested in the establishment of the Centre for Education Statistics and Evaluation in order to help make evidence more accessible to users of research, such as teachers and school principals.

The Centre for Education Statistics and Evaluation

The Centre for Education Statistics and Evaluation (CESE)[17] identifies and shares what works, in order to improve teaching and learning across early childhood, school, training and higher education, and to inform whole-of-government, evidence-based decision-making. The CESE undertakes analysis and evaluation of education programmes and outcomes, and turns data into knowledge, providing information about the effectiveness of different programmes and strategies in various educational contexts. The overriding purpose of the centre is to help educators and policymakers who do not necessarily have the skills or the access to the information to make research-informed decisions.

According to the CESE overview, the main responsibilities of the centre are:

- to provide data analysis, information, and evaluation that improve effectiveness, efficiency, and accountability
- to create a one-stop shop for information needs – an access point to the department's

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[17] http://www.cese.nsw.gov.au

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data that has appropriate safeguards to protect data confidentiality and integrity
- to build capacity across the whole educational sector by developing intelligent tools that make complex data easy to use and understand, and by providing accessible reports so that everyone can make better use of evidence available (NSW Department of Education and Communities, n.d.).

The CESE publishes an annual work plan that identifies the centre's priorities. The CESE's mission is not only to provide high-quality evidence, but to channel those findings that point to the most effective practices towards teachers and others. Translating research into explicit classroom practice is an additional task of the CESE. Teachers can then use that information to help them make decisions whenever they are in doubt about how best to achieve a given outcome. The CESE helps teachers to find out what works in different situations and make choices about effective practices for use in their classrooms.

Importantly, the CESE operates with an independent advisory council that guides the centre's work and helps ensure its integrity and relevance.

The CESE publishes all of their tools and research reports, which are available on the centre's website. The CESE wishes to start capturing information about who is downloading their publications and for what purpose they are using it, however the centre has not yet reached that stage.

The Professional Learning Clearinghouse
In 2014 the CESE developed The Professional Learning Clearinghouse,[18] which aims to provide teachers and school principals with easy access to evidence on effective professional learning and classroom teaching strategies. The Professional Learning Clearinghouse conducts literature reviews of key topics of interest in the field of education, and it provides summaries of the main points in the literature reviews, along with summaries of important research articles that were used to inform the literature reviews. The CESE uses a rigorous hierarchy of evidence to ensure that the evidence base on which it draws to prepare content for the Clearinghouse is a strong indicator of effectiveness. Academic papers on the effectiveness of different kinds of professional development are uploaded, and are given a rating that indicates how reliably the method used in the evaluation can estimate the causal impact on outcomes.

The CESE not only assembles an evidence base for informing strategy, but also follows up on

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[18] http://gtil.cese.nsw.gov.au

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the implementation of strategies with the most rigorous evaluation possible, and publishes the findings through evaluation reports. These evaluations may be undertaken by independent external consultants or conducted in-house by specialist research and evaluation units within the Department of Education.

The CESE Datahub

In addition to The Professional Learning Clearinghouse, the CESE also maintains a hub for education data, which brings together a range of publicly available education data sets. The CESE Datahub[19] is a searchable central repository that provides data regarding school characteristics, student enrolment, performance data, teacher information, and so on. The Datahub is constantly provided with new datasets as new data becomes available; it gives developers in industries an opportunity to export data and to use it to develop apps and develop their own views without the CESE necessarily having to be part of the effort.

The Business Intelligence programme

As well as undertaking data analysis and evaluation to improve effectiveness and efficiency, the CESE also develops tools to make data both easy to understand and easy to use, called the Business Intelligence programme,[20] which was launched across the Department of Education in 2014 and 2015. The Business Intelligence tools ensure that current information is available, by pulling together data from many sources and presenting information in a variety of easy-to-read formats targeted at educators and policymakers. The Business Intelligence tools are meant to help users to analyse and compare data sets, and to make more informed decisions, for instance, to improve the school planning process (NSW Department of Education and Communities, 2013).

"Tell them from Me"

In New South Wales there is little system-wide information available about student wellbeing and engagement, and effective teaching practices. Therefore, the CESE launched the "Tell Them From Me" student, parent and teacher surveys[21] in 2013 in order to gather evidence and baseline data for the following year's planning cycle. The "Tell Them From Me" survey data allows the CESE to analyse student performance data and the impact of engagement, wellbeing, and effective teaching practices on student outcomes. The survey is held once or twice a year, and schools are encouraged to use the data as part of their ongoing community and stakeholder discussion.

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[19] https://data.cese.nsw.gov.au
[20] http://www.cese.nsw.gov.au/information-management/business-intelligence?view=featured
[21] http://surveys.cese.nsw.gov.au

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Specific initiatives connected to the CESE
In 2014 the NSW government launched the School Excellence Framework (NSW Department of Education and Communities, 2014), which is an evidence-based framework that identifies explicit school practices that are directly related to school-wide improvement and improved student outcomes. Among other things, the framework is meant to help schools to reflect on and evaluate their effectiveness. Thus, schools are tasked with using research in relation to the framework. Moreover, the framework is a model for NSW schools to self-assess against a set of standards that identify their effectiveness, as it provides a clear description of the key elements of high-quality practice in three domains: learning, teaching, and leading. The framework describes fourteen elements of these three domains that define the core business of excellent schools in three stages: delivering, sustaining and growing, and excelling. Each year, schools perform a self-assessment of their practices against the framework, to inform their school plans, to identify areas in need of improvement and to plan for the ongoing learning of each of their students. The NSW Department of Education also uses the framework as an accountability mechanism to do external validation of NSW schools on a cyclical basis.

Through the School Excellence Framework, teachers in NSW schools are encouraged to adopt evidence-based teaching strategies in terms of school self-assessment and planning, but a strong accountability culture has not been put in place. In theory, therefore, teachers are expected to use research or research-based knowledge in their practice, but there is no legal requirement for them to do so. Nor is there a requirement for commissioned research that is published for practice to be in easily accessible and applicable formats, which means that there is a great need for research to be translated into explicit practices for teachers. The NSW Department of Education is trying to orient its publications and tools in such a way as to translate particular research results into a form accessible to classroom practitioners, Accordingly, the department sees the translation of research and evidence for practitioners as an increasingly important task.

To facilitate the use of research and to get teachers to engage with evidence, the Department of Education also promotes the use of technology. Because teachers are often under a lot of time pressure, using technology is a quick and effective way to make research-based knowledge available to them. In general, the department uses a range of social media pages, for instance Twitter, LinkedIn, and Facebook, to facilitate networks for school practitioners (NSW Department of Education, n.d.-a). The Business Intelligence tools developed by the CESE are also a way of using technology to provide evidence to educators in NSW schools. The Department of Education uses a social media communication platform called Yammer that teachers and other Department of Education employees may join to share and discuss

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practices, get updates on research findings and activities, ask questions, and so forth. As with Facebook, department employees may join a range of groups on Yammer, with focuses ranging from information technology to professional development, including the Centre for Education Statistics and Evaluation, and a group focused on student wellbeing. However, unlike Facebook, access is restricted to people with a Department of Education email address. The department puts a lot of their content through Yammer, which is widely picked up by a range of employees, including teachers. Because the platform is not closely monitored, teachers tend to engage with it informally, but also give the department a lot of feedback to through the platform.

Economy and funding

The New South Wales Department of Education does not have resources to finance or subsidise the use of research in schools. However, the department develops tools and makes these available to teachers in order to support them in undertaking action research and site-based research.

Every year the Department of Education receives a budget from the Australian federal government's Treasury, and within some regulatory requirements the department has the power to determine how the budget is spent, or to direct existing funding to new projects. This means that the department's research and evaluation work is funded directly by the federal government, either through the Treasury or through additional funding of new projects. However, the department has recently transitioned to a needs-based funding model that is used to distribute resources to all NSW public schools, which means that the funding is allocated directly to schools based on student needs (NSW Department of Education, n.d.-b).

The Department of Education does not formally collaborate with universities or other research units, but some research tasks and projects are commissioned from universities from time to time. In New South Wales, research units are usually attached to universities and therefore are a part of the political strategy and funded by the NSW government. New South Wales does not have a culture of private investments, which means there are only a few privately funded organisations that make research available, such as the Australian Council for Educational Research, the Grattan Institute, and the Centre for Independent Studies. There is also a national process of funding research between universities and partner agencies, and the department is party to three of those funded partnerships.

Teacher education programme

In Australia, teacher education has become part of the general university offerings rather

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being a system of teacher's colleges, as it was earlier. Therefore, many universities now have a school of education where teacher training is undertaken, and teacher's colleges have been replaced by the idea of higher expectations and higher qualifications of future teachers. There are several routes to becoming a teacher in New South Wales. However, students need to have completed at least four years of tertiary study at a recognised university or higher education institution in order to be accredited as a teacher. Students who want to be primary school teachers may either complete an accredited four-year teaching degree such as a Bachelor of Education (Primary), or a combined or double degree such as a Bachelor of Arts/Bachelor of Education (Primary). However, students may also complete an undergraduate degree (such as a Bachelor of Arts or Science) and then complete an accredited graduate entry teaching degree such as a Master of Teaching (Primary). These degrees give students a general qualification to teach in a primary school or other context with young children (aged 5–12 years) from Kindergarten to Year 6 (BOSTES, n.d.-a).

Students who want to be secondary school teachers may either complete an accredited four-year teaching degree, which includes a Bachelor of Education (Secondary), or a combined or double degree such as a Bachelor of Science/Bachelor of Education (Secondary). Students can also complete an undergraduate degree (such as a Bachelor of Arts or Science) and then complete an accredited graduate entry teaching degree, such as a Bachelor of Teaching (Secondary) or Master of Teaching (Secondary). These degrees qualify students to teach students from year 7 to year 12. Secondary school teachers may teach one or more subjects from the secondary school curriculum (BOSTES, n.d.-b).

The NSW government is currently strengthening requirements for acquiring teaching degrees, and pushing for more consistency in, and higher expectations of teacher education. For instance, the Board of Studies, Teaching and Educational Standards NSW (BOSTES)[22] accredits all teaching degrees in NSW, and future teachers will need to meet increased academic standards in order to study for an accredited undergraduate teaching degree in NSW. This means that there is now a minimum expectation of high school graduation levels, to be considered eligible to study for a teaching degree at a university. Furthermore, since 2016 all teaching education students are required to pass literacy and numeracy tests before beginning their final professional experience placement (BOSTES, n.d.-c).

Although New South Wales has a long tradition of conducting statewide assessments of students, which means that teachers in NSW schools are fairly good at comprehending assessment data, the strengthened requirements for earning teaching degrees are a way to

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[22] http://www.boardofstudies.nsw.edu.au

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raise students' understanding of what constitutes high-quality research, and how to use data and research-based knowledge in their future teaching practice. Therefore, using or accessing research is part of teacher training in New South Wales. However, different universities manage teacher training in various ways, which means they often offer different content and have different priorities in their teacher education programmes. In other words, there is great variety among the universities, but the Department of Education is trying to push higher expectations of students' understanding and use of data.

Further teacher training: Skill development and seeking new knowledge

As stated above, the Board of Studies, Teaching and Educational Standards NSW (BOSTES) accredits all teaching degrees in NSW, however, the board is also responsible for school curricula, assessment, and teaching and regulatory standards in NSW schools. BOSTES brings together the tasks previously provided by the Board of Studies of NSW and the NSW Institute of Teachers, and is a new authority in New South Wales. The board was created by the NSW government in 2014 to improve teaching quality and student learning outcomes in NSW schools by handling the registration and accreditation of schools and teachers, among other things. In New South Wales teachers must be accredited by BOSTES to start or return (after a break of five years or more) to teaching in a NSW school. Accreditation means a teacher has met the Australian Professional Standards for Teachers (BOSTES, n.d.-d), helping to ensure that teachers can demonstrate appropriate levels of professional knowledge, professional practice, and professional engagement. Teachers may earn their accreditation after they have gained their teaching qualifications, and accredited teachers are required to maintain their accreditation to continue working as teachers in NSW. Maintaining the accreditation requirements requires teachers to continually develop their knowledge and practice, which is based on the premise that ongoing learning is an integral part of a teacher's professional life. Among other things, this means that teachers are obligated to complete at least 100 hours of professional development every three years of teaching, and engaging with research is one way to do that (BOSTES, n.d.-e). This could be involvement with specific action-learning or research project developed in line with school priorities under the auspices of a university or organisation that is an endorsed provider of professional development. BOSTES is pushing out to teachers opportunities and ideas about participation in research on location.

In addition to certain mandatory training courses regarding child protection issues, there is a great variety of in-service training courses and activities available to teachers. These range from discussions with colleagues about professional issues, to in-class support with a consultant focusing on strategies for teaching, to engagement with a university research project. However, most schools have a plan that identifies their key priorities. This also

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means that most in-service training is at the discretion of the individual teachers and the principal of their school. Moreover, teachers in NSW schools are provided with six days in the school year that are pupil free, so NSW schools offer quite a lot of opportunity to ensure that professional development is catered to. In consequence, expectations and anticipation of ongoing professional development in New South Wales are quite a high, and there is an obvious orientation towards improving the use of research and evidence in school practice. There is no legal requirement for teachers to work with research and evidence as a part of their in-service training. However, there is a legal requirement for half the teachers' professional development to be provided by a university or organisation that has been endorsed as a provider of professional development.

Experiences: successes, challenges, and lessons learned
In closing, the interviewee was asked to elaborate on the Department of Education's experiences of knowledge mobilisation in primary and lower secondary education, for instance what promotes or hinders the use of research, and the teachers' general attitudes towards using research-based knowledge in their practice.

According to the interviewee, teachers in NSW schools find that using data matters, that an evidence base matters, and that there are several places they can look for evidence that they may not have looked before. Generally, teachers appear to be interested in and willing to use research if they find that it helps them in their daily teaching practice. However, because teachers are often very pressed for time and overburdened by a crowded curriculum, the department finds that it is very important to make research applicable to a classroom setting. Therefore, translating research and evidence into practice for teachers is an increasingly important task for the department. Making research more practical for the teachers and about their own school contexts seems to encourage them use research-based knowledge in their teaching practice, which is why the department is currently engaged in converting research results into concrete instructions for practice. According to the interviewee, it also seems important that the teachers receive support when learning how to apply research in practice and how to use the tools developed by the Department of Education.

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New Zealand

Policy framework

New Zealand is an island country, comprising two main land masses and numerous smaller islands, with a population of approximately 4.6 million (Statistics New Zealand, 2015). In terms of governance, the country functions within a framework of a parliamentary democracy. Education in New Zealand is overseen by the Ministry of Education. The ministry is responsible for developing a strategic policy for the educational sector and for shaping a direction for education agencies and providers, and for contributing to the New Zealand government's goals for education.

Structure of primary and lower secondary education

In New Zealand, schooling follows a three-tier model of primary, secondary and tertiary education (higher education and vocational training). Schooling is compulsory for ages six through sixteen, though many children start school at the age of five, and continue schooling at least until the age of seventeen. All children are entitled to free schooling from the age of five until the age of nineteen. There is a government focus on making young people stay in the educational system at least until their eighteenth year.

Primary schools are divided into two types: (1) "full," for ages five through twelve, or (2) "contributing," where students move to an intermediate school for the last two years of primary school. The goal of intermediate schools is to provide a bridge to secondary school. Secondary schools are for those aged 13 through 18 and are also called colleges, high schools, or grammar schools. Primary and secondary education in New Zealand has 13 year levels, with the former including years 1 to 8, and the latter, years 9 to 13 (Education New Zealand, 2016; Ministry of Business, Innovation and Employment, 2016).

Several types of schools exist in New Zealand: state schools, state-integrated schools (including partnership schools) and private schools. Schooling is free of charge, however parents are asked to help pay for extracurricular activities, and for trips, exam fees and other costs (Ministry of Education, n.d.-a). State schools are funded by the government, and are attended by 85 per cent of New Zealand students. State-integrated schools are schools with a focus on special values or theories, such as religious faith or specific philosophies. This includes partnership schools, which are a type of charter school that has greater freedom with regard to school organisation, employment arrangements, curriculum, and teaching methods and practices (Ministry of Education, n.d.-b). Approximately ten per cent of New Zealand students attend state-integrated schools, which are government funded, but may demand

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fees for various facilities. Partnership schools are funded by the state on a per-student basis.

The content of primary education is determined by the national curriculum. The New Zealand Curriculum states the official national policy regarding teaching and learning in state schools, including state-integrated schools (Ministry of Education, n.d.-c: 6). The following eight principles are laid out as the foundations of all curriculum decision-making: High Expectations, Concerns the Bicultural foundations of New Zealand (English and Maori), Cultural Diversity, Inclusion, Learning to Learn, Community Engagement, Coherence, and Future Focus (Ministry of Education n.d.-c: 9).

Students are regularly assessed in reading, writing and mathematics in order to determine their fulfilment of age-level expectations as laid out in the National Standards. The National Standards are designed to correspond with the national curriculum, in that they state clear expectations for reading, writing and mathematics at each level of the curriculum (Ministry of Education, 2009). Implemented in 2010, these standards describe reference points for achievement at each grade level for the first eight years of schooling. Evaluating students on the basis of National Standards is seen as an important part of teaching that complies with the curriculum (Ministry of Education 2015). In secondary education, students follow the requirements of the National Certificate of Educational Achievement (NCEA) of 2002 (New Zealand Qualifications Authority, n.d.).

Reflecting the bicultural character of New Zealand, some schools teach in Maori and base their education and curriculum on Maori culture and values. These schools, called Kura Kaupapa Maori (kura), are funded by the state and teach the national curriculum for Maori schools, entitled "Te Marautanga o Aotearoa" (Ministry of Education 2016). This curriculum is based on Maori philosophies, making New Zealand the only country in the world with national curricula in two languages, which are not direct translations of each other (Statistics New Zealand, n.d.). In this report we use "schools" as an umbrella term for state schools, state-integrated schools, and kura.

The educational system in New Zealand is highly devolved, which means that individual schools are autonomous and have their own governance. However, as mentioned, the New Zealand Curriculum is still nationally developed and was last reviewed in the years 2000–2002. The current curriculum is perceived as flexible, as it is regarded as a general framework rather than a detailed description of what students should be taught and achieve as they progress through school. This means that the individual schools have the autonomy to decide which educational methods are used and how the curriculum will be applied and delivered.

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Political strategies and initiatives

In recent years in New Zealand there has been a great deal of political interest in and focus on generating evidence and supporting knowledge-building and use in educational policy, research, and practice. However, there is no overall policy or strategy for knowledge mobilisation in education; instead, the system relies on schools and teachers to be committed to using and implementing research and evidence to inform school practice. Therefore there is a strong emphasis on teacher-led inquiry, which can be described as an evidence-based process that allows teachers to trial new methods and tools related to their class needs. Thus a teacher or school identifies a learning challenge, then gathers information (including looking at a range of research evidence) and identifies how to incorporate it into their teaching practice. The New Zealand Ministry of Education sees teacher-led inquiry and curiosity as a driver to development and strives to provide teachers with information and influence, rather than direct instructions on how they should use evidence in their teaching practice.

In order to facilitate the use of research and to get teachers, among others, to engage with evidence the ministry has launched the iterative Best Evidence Synthesis (BES) programme, which is a collaborative knowledge-building strategy designed to strengthen the evidence base that informs education policy and practice in New Zealand (Education Counts, 2016; Education Counts, 2016a).

The iterative Best Evidence Synthesis (BES) Programme

The primary mission of the BES programme[23] is to draw together the best available evidence to explain "what works" and "why," in order to improve educational outcomes and to make a bigger difference for New Zealand students. Moreover, BES aims to contribute to an ongoing evidence-based dialogue of "what works" among policymakers, educators and researchers, and to make research-based knowledge available to teachers. The programme is run primarily as a web-based knowledge broker of successful education interventions whose audience includes both school practitioners and policymakers.

The main output of the programme are BES iterations (also called best evidence syntheses) in which research evidence is collected and explained to schools and teachers, among others. As the name indicates, each BES is part of an iterative process that anticipates future research and development that informs educational practice. Each synthesis is an iteration that is continually updated because of the changing nature of the available knowledge (Alton-Lee, 2004).

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[23] http://www.educationcounts.govt.nz/topics/bes

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A BES iteration is a synthesis of evidence linked to a range of desired learner outcomes, derived from both international and New Zealand research studies. A BES is a kind of summary that may encompass extracted information from many research studies. The syntheses provide theoretical explanatory tools that describe and clarify the research findings, in order to assist teachers to translate and adapt the findings to their own school contexts. The synthesis approach pays particular attention to research that traces the positive or negative impact of particular approaches or influences on learner outcomes, and approaches that made a greater difference for learners (Alton-Lee, 2004: 2). In relation to the best evidence syntheses, the ministry also publishes case-studies from across the BES publications. These cases describe actual examples of professional practice and illustrations of the findings of the syntheses. In this way the BES case-studies aim to support teachers and other school practitioners in grasping the big ideas behind effective practice and in providing vivid insight into their application (Education Counts, 2016a).

Other resources are also accessible from the BES webpage, including summaries of best evidence syntheses, BES exemplars, and BES what works spotlights.

The summaries are short introductions to the content of the best evidence syntheses, published and distributed by the International Academy of Education as part of their international commitment to fostering scholarly excellence in all fields of education. The International Academy of Education is a not-for-profit scientific association that promotes educational research through their Educational Practices Series, for instance, of which the BES summaries are part. The aim is to assist practitioners to improve practice through the provision of short publications that present the results of bodies of research, such as the BES programme, in easy-to-read booklets (Education Counts, 2016b). The entire series is published in cooperation with the International Bureau of Education in Switzerland, and is available on the International Academy of Research's web page.[24]

The BES Exemplar series was created in response to requests from New Zealand teachers and principals for "real-world" examples of quality teaching across the curriculum. The aim of the exemplars is to show how significant improvements may be made through teaching, and they illuminate the high-impact research that informed and developed the expertise of the teachers, facilitators, school principals, and researchers they feature. Wherever possible, the exemplars are derived from research carried out in New Zealand schools. The series of BES exemplars is prepared by the BES programme, and their primary audience is teachers (Education Counts, 2016c). Finally, the BES Spotlights provide more evidence of "what works" to help advance valued outcomes in education (Education Counts, 2016d).

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[24] http://www.iaoed.org/node/29

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All BES resources are freely downloadable from their webpage,[25] and teachers and other school practitioners in New Zealand may also order hard copies of the BES resources, free of charge.

Overall, the BES programme is clearly a very ambitious effort to generate knowledge and to provide useful and academically rigorous assessments of "what works" in education, and according to the interviewee, the BES resources are used widely by New Zealand teachers and by the organisations that provide professional development for teachers. However, the ministry does not monitor how often the BES resources are downloaded, or by whom.

Inclusive education
In order to help make evidence more accessible to New Zealand schools and teachers, and to support the New Zealand government's vision of all schools demonstrating inclusive practices, the ministry has developed an online knowledge centre entitled "Inclusive Education."[26] The centre is run primarily as a web-based platform that provides teachers with evidence-based strategies to support students with diverse needs, that is, students who may not be receiving specialised assistance and funding through Ministry of Education services. However, the content of the website is also useful when working with all students (Ministry of Education, n.d.-d).

The Inclusive Education knowledge centre develops guides that expand on specific topics such as dyslexia or ADHD, guides to school-wide Inclusive Education strategies and guides that are specifically about effective strategies for use in the classroom. Each guide includes a series of evidence-based strategies supported by suggestions for practice, which are presented in a range of ways – text, visuals, and video. The guides are intended as in-depth resources that teachers can work through over time, with colleagues, school principals and so on, or in a professional development context.

The centre provides links to resources and specialist support services so that teachers may easily explore a topic in depth by investigating a range of resources, including research literature, which may be linked to each guide and suggestion. The Inclusive Education website also functions as a searchable central repository that gives teachers the opportunity to find and download resources by keyword, topic, or specific format.

According to the interviewee, in 2015 the ministry presented workshops to 1,520 resource teachers in learning and behaviour (RTLB) as well as to special education need coordinators/

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[25] http://www.educationcounts.govt.nz/topics/bes
[26] http://inclusive.tki.org.nz

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learning support staff, principals, deputy principals, and ministry special education staff. These workshops introduced Inclusive Education concepts and the resources available to support inclusive practices in schools. Participants reported that the workshops had a focus on effective, flexible teaching practices for all students, including those with needs arising from dyslexia, dyspraxia, and ASD, and according to the interviewee the workshops were extremely well received. Participants also reported that as a result of the workshops they are now thinking about inclusive practices in a different way and seeing the opportunities for planning for all students.

In New Zealand work is also developing around learning networks, with the government devoting a large amount of money for schools to work together to identify and address common achievement challenges through an initiative entitled Investing in Educational Success.

Investing in Educational Success
The overall purpose of the Investing in Educational Success (IES) initiative[27] is to improve student achievement while offering new career opportunities for teachers and principals (Ministry of Education, 2016a). Based on the knowledge that the quality of teaching plays a crucial role in determining student success, the IES's aims include:

- Improving teaching practices nationwide
- Allowing teachers the opportunity to collaborate and share knowledge
- Giving all children the opportunity to benefit from good teachers across a group of schools
- Improving coordination between schools in order to ease transitions through the educational system (ibid)

The IES initiative is intended to enable the most effective teachers and principals to share their knowledge and expertise with multiple schools. A $359 million funding pool over the first four years and an additional $155 million a year after that gives schools the resources to build communities of schools, offer teachers additional roles as knowledge providers and mentors, and develop the role of the principal to attract the best qualified school principals (for the most high-need schools) (Ministry of Education, 2016b). Communities of schools are groups of about ten schools that work together to achieve common performance goals and share knowledge between teachers, for instance by letting exemplary teachers be models of learning for other teachers by opening their classrooms to them, thereby strengthening the "teaching as inquiry" practice of other teachers by providing opportunities for observation and discussion (Ministry of Education, 2016c). Schools will receive additional funding to

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[27] http://www.education.govt.nz/ministry-of-education/specific-initiatives/investing-in-educational-success

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release other teachers to spend time on the job, continuing to develop their professional skills for the benefit of students in their own classrooms. In this way the IES initiative provides more time for teachers to focus specifically on working together to handle achievement challenges. Communities of schools and schools themselves decide how best to use this time.

As of June 2015, 29 communities of schools, involving some 220 schools, were working on their achievement challenges, with more communities yet to come. More than 80,000 students across New Zealand are covered by these communities of schools (Ministry of Education, 2016b).

One component of the IES is access to the Teacher-led Innovation Fund which supports groups of teachers working with innovative practices that have the potential to improve learning outcomes, especially for students with Maori background, students with special needs or students from socioeconomically disadvantaged backgrounds (Ministry of Education, 2016d). In this context, the term "innovative" signifies inquiry into new practices, or applying existing practices in new contexts, and then systematically testing their effect on learning outcomes. Teachers in all primary and secondary schools may apply, including teachers who do not belong to a Community of Schools. The fund amounts to a total of $18 million over a five-year period (2015–20), administered by the Ministry of Education, and gives teachers the time to look into "puzzles of practice" concerning individual students or groups, and share their knowledge of "what works" with other schools and school practitioners across New Zealand (New Zealand Government, 2016). Funded projects must meet several criteria, including complementary specialist expertise, to ensure that the project team has the collective expertise required to design and implement a robust project. Moreover, a requirement is that the project be and remain teacher-led, not driven by researchers or other external experts (Ministry of Education, 2015a: 3). Overall, the fund enables New Zealand teachers to work in partnership with academics and researchers, and to access a wide range of effective teaching practices, research-based knowledge, and tools.

The Positive Behaviour for Learning programme
The Positive Behaviour for Learning[28] programme, PB4L for short, is a ministerial initiative that is founded on the principles that positive behaviour may be learned and that environments may be changed to support effective teaching and learning for every child or student. The programme is derived from a behaviour summit that recommended that the Ministry of Education look internationally for successful initiatives with a strong research and evidence base, and as a result, the ministry identified a small number of international, evidence-ba-

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[28] http://pb4l.tki.org.nz

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sed programmes and initiatives, for instance the Incredible Years programme, which were adapted and enhanced to ensure that they are a good fit for the New Zealand educational context. The framework of PB4L is based on international evidence of "what works," and it provides tools for supporting long-term and sustainable changes in behaviour, aimed at New Zealand schools and early childhood education centres. These include whole-school change initiatives, targeted group programmes and individual student support services (Ministry of Education, 2015b).

In order to help teachers and school principals to implement and apply the above-mentioned initiatives and programmes, the ministry has set up leadership teams within the schools and offers coaching by ministry staff or psychologists, for instance. Providing schools with guidance on how to interpret behavioural data and then use it in an effective way is an important part of the PB4L programme, which is delivered by the Ministry of Education in partnership with a range of organisations and groups, including non-government organi- sations and universities (Ministry of Education, 2015c, Ministry of Education, n.d.-e).

Other initiatives
Finally, the "Insights for Teachers" publication series is worth mentioning. "Insights for Teachers" is a series of research briefs designed to bring the Ministry of Education's wide range of data and research to the teaching profession in New Zealand (Education Counts, 2016e). In this fairly new series, the ministry reports on the New Zealand findings from the OECD Teaching and Learning International Survey (TALIS), as well as on the New Zealand findings and implications of PISA for teaching and learning mathematics. These research briefs are available on the Education Counts web page.[29]

Through the above-mentioned initiatives, the Ministry of Education hopes to influence how teachers and other school practitioners think about research, in order to make it easy for them to look for evidence-based practices and programmes to explore, and to encourage and support them in applying these to their daily teaching.

Although the New Zealand Ministry of Education has no formal, ongoing collaboration with universities or other research units, according to the interviewee, many research tasks and projects, such as literature reviews, are commissioned from universities from time to time, issue by issue. In New Zealand it is not a requirement that commissioned research be published for practice in easily accessible and applicable formats. Therefore, the ministry is trying to orient its publications and guides so as to summarise and translate how certain

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[29] https://www.educationcounts.govt.nz/publications/series/insights-for-teachers

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research results may be of use to teachers and other classroom practitioners.

The use of research in schools is also highlighted in the practising teacher criteria developed by the New Education Council of Aotearoa New Zealand. The practising teacher criteria is a framework of twelve interdependent and overlapping criteria that identifies the core competencies that all fully certified teachers in New Zealand are expected to have (Education Council of Aotearoa New Zealand, 2016). For instance, according to the criteria, fully certified teachers are expected to engage with evidence and professional literature to reflect on and refine their teaching practice, and to use critical inquiry and problem-solving effectively in their professional practice. Teachers in New Zealand are encouraged and expected to use research and evidence in their teaching practice; however, it is not a legal requirement.

Teacher education programme

In New Zealand, all universities have a teacher education programme, but non-university institutions/organisations also provide teacher training. There are one hundred and forty approved Initial Teacher Education (ITE) programmes in New Zealand, delivered as eighty qualifications by 25 providers. Some programmes focus specifically on early childhood education (0–5 years), primary or secondary school, and Maori immersion, others allow students to choose as they progress (Education Council of Aotearoa New Zealand, n.d.). The requirement for students to complete an ITE programme is common to all teacher education providers. ITE programmes consist of curriculum, learning and pedagogical theory, professional studies, practicum experiences and cultural studies, and lead to a teaching qualification that permits students to teach in early childhood education centres, and primary and secondary schools, including kura (Maori schools) (ibid.). ITE programmes may take the form of undergraduate degrees (a three- or four-year degree), undergraduate diplomas in early childhood education (a three-year degree) or one-year graduate diplomas (if the student has prior qualifications at the appropriate level).

Teachers at the primary level (starts at grade 1 and goes to grade 8) are qualified to teach many different subjects. To teach at the secondary level (from grade 9 to grade 13), teachers need to be qualified to teach at least one main subject and one or two secondary subjects. However, the degree of teacher specialisation tends to depend on the size of the individual schools; teachers in larger schools are more likely to be able to specialise in a subject area than teachers who are employed by small schools.

The graduating teacher standards

All providers of New Zealand teacher education programmes must meet a number of spe-

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cific requirements set out and managed by the Education Council, and all approved teacher education programmes must be reviewed every six years by a review panel. In addition to the requirements set out by the Education Council, all programme applications are required to show how the graduating teacher standards are met in programme delivery and assessment. The graduating teacher standards were developed by the Education Council, in cooperation with a range of representatives from the education community, in order to provide more certainty with regard to the quality of all graduates from all teacher education programmes in New Zealand (Education Council of Aotearoa New Zealand, n.d.-a). The standards describe the essential professional knowledge, skills and values that graduates of ITE programmes must acquire, and they focus on graduating teachers' use of research and evidence in order to promote student learning, for instance. According to the standards, teachers must systematically and critically engage with evidence to reflect on and refine their teaching practice, and they must gather, analyse, and use assessment information to improve student learning. The ITE programme is expected to enable future teachers to acquire knowledge of, and skills in how to access, interpret, and use educational research. According to the interviewee, the ministry plans to work with the Education Council to establish whether there is a need to strengthen initial and ongoing teacher education to identify and respond to students' additional learning needs, particularly those associated with dyslexia, dyspraxia, and ASD.

Teacher certification
In order to maintain a high standard of teaching, all New Zealand teachers must also be certified by the Education Council. Teachers may attain their certification after they have completed the ITE programme, thus all teacher graduates in New Zealand must obtain a mandatory practising certificate in order to be accredited to teach in the general education system of New Zealand (Education Council of Aotearoa New Zealand, n.d.-b). There are three types of practising certificates: provisional, subject to confirmation, and full. However, the practising teacher criteria guide professional learning for all teachers seeking to acquire and maintain full certification. Therefore, the criteria describe what beginning teachers need to work towards in order to gain full certification, and what experienced teachers must demonstrate at appropriate levels of expertise to maintain a practising certificate.

The first type of certification (provisional certification) applies to newly graduated teachers who have not acquired the necessary teaching experience to live up to the practising teacher criteria. The other two types of practising certificates (subject to confirmation or STC, and full certification) are given to experienced teachers. STC certification is given to experienced teachers who, for valid reasons, have not recently been meaningfully assessed in terms of

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the practising teacher criteria, whereas full certification is given to teachers who can show appropriate recent teaching activity and assessment (Education Council of Aotearoa New Zealand, n.d.-c). Fully certified teachers need to renew their practising certificate every three years.

As mentioned, the practising teacher criteria consist of a range of criteria and indicators that define high-quality teaching. They describe the common elements of teaching that apply regardless of context, rather than describing everything a teacher does or may go on to do. The criteria are meant to be used as a framework for teachers' ongoing practices, to guide their reflections and professional learning, not just as assessment criteria.

Seven of the criteria relate to the teachers' professional knowledge in practice, including gathering, analysing and using assessment information to reflect on and evaluate the effectiveness of their teaching, and using critical inquiry and problem-solving effectively in their teaching practice by engaging with evidence and research literature in a systematic way (Education Council of Aotearoa New Zealand, 2016).

In order to live up to the foregoing criteria, newly graduated teachers are required to complete a programme of induction and mentoring, including guidance from a mentor teacher, evaluations of practice, and participation in professional development activities, before they may apply for full certification (Education Council of Aotearoa New Zealand, n.d.-d). All schools are expected to have an induction and mentoring policy in place that should be based on the Education Council's guidelines for induction and mentoring and mentor teachers (Education Council of Aotearoa New Zealand, 2015). Induction is a broad term for all support and guidance (including mentoring) provided to newly graduated teachers as they begin their professional practice in real-life teaching situations. According the Education Council, this is about building the teaching profession and ensuring that teachers are part of a learning community focused on continually improving the learning outcomes of all students. This reflects an overall shift in New Zealand education policy and practices, from a view of induction as "advice and guidance" to one of skilled facilitation of "learning conversations" focused on evidence of teachers' practice. Rather than just providing "advice" and emotional support, the mentor teachers are meant to co-construct professional and reciprocal learning (Education Council of Aotearoa New Zealand, 2015).

Aside from the fact that teachers in New Zealand are required to demonstrate that they live up to each of the practising teacher criteria in order to become fully certified teachers, which includes collecting and using data to make instructional decisions to facilitate lear-

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ning, there is no legal requirement for teachers to use research-based knowledge in their practice. Nor is there a formalised requirement for using or seeking research and research findings as part of teacher training, aside from what is set out in the graduating teacher standards. According to the interviewee, the Education Council is currently reviewing the teacher standards and the provision of ITE. The Ministry of Education is working closely with the council in both of these areas.

Further teacher training: skills development and seeking new knowledge

As stated above, all teachers in New Zealand must be certified by the Education Council to be allowed to teach in the New Zealand general education system. To be certified means a teacher has met the practising teacher criteria, which helps to ensure that New Zealand teachers can demonstrate appropriate levels of professional relationships and professional values, and professional knowledge in practice. Fully certified teachers need to renew their practising certificate every three years. The renewal process focuses on six criteria that the teacher must meet to be approved for the renewal of his/her full certification. For instance, to maintain fully certified status, the teacher is required to have completed satisfactory professional development within the last three years of teaching. Examples of professional development are engaging with research-based activities, such as participating in action research, or participating in continuing education, for instance, through tertiary courses, workshops, seminars, and conferences. However, appropriate professional development could also be direct assistance of other teachers or student teachers, or development of a new programme in cooperation with colleagues.

In New Zealand, professional development and in-service training provided for the teaching profession may happen in a number of ways. Individual schools may use their own budgets to finance in-service training courses for their teachers, but the Ministry of Education also offers a range of professional development activities. However, there are no formal regulations stipulating how often teachers in New Zealand are expected to engage in professional development or other kinds of in-service training, nor is there a legal requirement that teachers engage with research and evidence as a part of their ongoing professional development.

The purpose of the professional development and in-service training courses funded by the ministry varies greatly, as they are aligned with specific needs and learning challenges identified by the individual schools. For instance, if a school identifies a learning challenge in mathematics, the ministry will provide in-service training for that problem. However, the ministry may also emphasise a specific matter, which will then be presented to teachers at the national level. The school-purchased professional development courses, which are

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delivered by many different contracted providers, also vary greatly. For instance, this professional development could take the form of tertiary courses, but it could also be in-class support with a consultant working with the teachers on-site.

Because of growing dissatisfaction with and concerns about professional learning and development across the educational sector in New Zealand, the Ministry of Education is currently making changes to its investments in professional learning and development or PLD (Ministry of Education, n.d.-f). In 2013 the New Zealand government established a professional learning and development advisory group to provide advice on the future design and organisation of PLD across the compulsory educational sector in New Zealand. Following the advisory group's recommendations, PLD for teachers is to be developed in compliance with seven key changes. These key changes include national priorities in the areas of mathematics, science, reading/writing and digital fluency, prioritised funding to schools with high numbers of low-achieving students, and building effective local, regional, and national networks of curriculum and subject-specific expertise, such as subject associations and gifted networks (Professional Development Advisory Group, 2014).

The advisory group also proposes establishing a national professional learning centre within the Ministry of Education, in partnership with key stakeholders, to share and ensure responsibility and accountability for the outcomes from the PLD investment across the compulsory education sector. A key responsibility for the national professional learning centre would be to create and design research, development, and evaluation opportunities at all levels of the system. The emphasis would be on developing evaluative capacity for the purpose of providing feedback to the different players in the different system levels, and create the capacity to learn in and through practice. The feedback would provide evidence about what is working well, and why it should be sustained, and what is not working so well and why it needs to be changed. Therefore, another key change in the PLD investment is to build professional and evaluative capacity within and across schools and communities of schools in order to support their gathering, analysing and using their data and evidence to identify what matters most in terms of generating greater equity and excellence for their students (ibid.).

According to the advisory group, it is vitally important that all teachers and school principals be able to access up-to-date and evidence-based specialised knowledge to inform and improve practices. Researchers and other academics could have a key role in contributing to the evidence base and its dissemination in ways that would improve the impact of professional learning and development for the teaching profession (ibid.).

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The advisory group's recommendations form the foundation of changes being made within the structures and processes for the PLD investment in New Zealand. These changes will be phased in over a period of three years, and by 2018, the key features are expected to be in place.

Experiences: successes, challenges, and lessons learned
In closing, the interviewee was asked to elaborate on the Ministry of Education's experiences with knowledge mobilisation in primary and lower secondary education, for instance, what promotes or hinders the use of research, and the teachers' general attitudes towards using research-based knowledge in their practice.

According to the interviewee, teachers in New Zealand are very interested in, and have a "real thirst" for using research once they have applied it to their own classroom and found that the research is effective and helps them in their daily teaching practice. However, as with teachers around the world, the time frame is a general concern and hindrance, and consequently a challenge to the teachers' daily work. Because teachers are often very busy and time-poor, it is critical to make knowledge accessible from their perspective. For instance, to make research more applicable in a classroom setting, the ministry has ensured that teachers can access the online knowledge centre (Inclusive Education) through their tablets and smartphones, and thus get information directly into their classrooms.

According to the interviewee, it is essential that teachers be given extra time to explore and apply new knowledge to their teaching practice. In his view, it is very important that the teachers be involved in the ministry's development of new tools and material, to ensure that the material is based on the teachers' actual learning needs and experiences, and not just what the ministry believes will work. When teachers are involved from the start they are often keener to implement new knowledge in their teaching practice.

Finally, the ministry has found that facilitating the development of knowledge (rather than lecturing on "what works") works well for teachers in New Zealand. With regard to this, the processes of collaborative and teacher-led inquiry also seem to influence how teachers embrace and apply research-based knowledge in their practice. Collaborative inquiry gives the teachers opportunities to reflect on, and apply their learning together.

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Norway

Policy framework

Norway is located in Northern Europe on the western and northern areas of the Scandinavian Peninsula, and numbers some 5.2 million people. In terms of governance, Norway functions within a framework of a parliamentary democracy. On a local level, Norway has a two-tier system of government: the county authorities (fylker) and the municipalities. The municipalities and the county authorities have the same administrative status, whereas the central government has overriding authority over and supervision of municipal and county municipal administration. Norway is divided into nineteen county authorities, which are subdivided into 428 municipalities. Despite differences in size, topography, and population, all municipalities have most of the same rights and responsibilities, and are required to fulfil the same functions.

In Norway the national education administration is organised in several levels. The parliament (the Storting) and the central government define the objectives for education and are responsible for deciding the framework for the education budget, whereas the Norwegian Ministry of Education and Research (Kunnskapsdepartementet) is responsible for implementing national educational policy. The Norwegian Directorate for Education and Training (Utdanningsdirektoratet), which is a subordinate executive agency for the ministry, has the overarching national responsibility for supervising primary and secondary education. The Directorate's main tasks are to promote high-quality development, quality assessment, analysis and documentation in primary and secondary education, and to perform administrative tasks. Thus the Directorate is responsible for ensuring that Norwegian students receive an education of high quality. Along with the County Governors (fylkesmannen) the Directorate also supports the local authorities that are responsible for the schools when launching new educational initiatives. The County Governors represent the central government at the regional level and work to ensure that parliamentary and governmental decisions are implemented correctly and that the established objectives for education are achieved. The County Governors act as links between the ministry and the Directorate on the one hand, and between the educational sector in municipalities and counties, on the other. The County Governors are responsible for supervision and dealing with complaints related to regulations, participation in quality development, information, guidance, and various administrative matters. Responsibility for operating and administering primary and lower secondary schools lies with the municipalities (Ministry of Education and Research, 2007).

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Structure of primary and lower secondary education

Public schooling in Norway is free of charge and divided into primary school (Barneskole) and lower secondary school (Ungdomsskole). Primary and lower secondary education in Norway amount to 10 year levels, with the former covering years 1 to 7 (ages 6–13) and the latter covering years 8 to 10 (ages 13–16). Education in Norway is mandatory for all children aged six to sixteen. In autumn 2015, 623,800 students attended primary and lower secondary schools in Norway. Of these students, 21,600 were enrolled at private schools. In Norway, private primary and lower secondary schools must be approved by the Private Education Act in order to receive financial support from the state, to the tune of 85 per cent of the operating costs of publicly owned schools (Statistics Norway, 2015; Ministry of Education and Research, 2007).

The objectives and principles for teaching in primary and lower secondary schools are laid down in the national curriculum, which includes: core curriculum, principles and guidelines for primary and lower secondary education, and curricula for individual school subjects. Within the national curriculum and the framework of legislation and regulations, individual municipalities and county authorities, schools and teachers have the autonomy to decide what learning materials to use and what teaching methods to adopt (Ministry of Education and Research, 2007).

The culture and traditions of the Sami community are part of the common Norwegian culture, and in areas defined as Sami districts (and according to specific criteria elsewhere in Norway) teaching follows a special Sami Curriculum. The subject curricula are partly separate curricula, such as for the Sami language and for Sami handicraft (duodji), and partly adapted parallel curricula, such as for science and music. However, both the national curriculum and the Sami Curriculum require all students in Norway to be acquainted with Sami culture (Ministry of Education and Research, 2007; Ministry of Education and Research, 2014).

Political strategies and initiatives

In Norway there is a substantial focus on developing and promoting productive research communities that have the capacity and competence to generate high-quality educational research relevant to the development of the educational sector. Therefore, the Norwegian Ministry of Education and Research (Kunnskapsdepartementet) makes an effort to develop productive, competent research communities that meet the need for research-based knowledge about and for the entire educational sector. However, despite their continuing efforts to ensure an effective infrastructure of knowledge mobilisation, the ministry also

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faces challenges to making improved connections between the available research-based knowledge and educational practice.

The Ministry's strategy for educational research
A key Ministry of Education and Research initiative is their five-year strategic plan for educational research (Kunnskapsdepartementet, 2013), which is a long-term management tool that identifies the direction and priorities of the work with educational research from 2014 to 2019. The strategy was launched in 2013, and expands on the ministry's previous strategy for educational research (Kunnskapsdepartementet, 2007).

The strategy addresses research and knowledge development about and for early childhood education and care, primary and secondary education and training, tertiary vocational education, higher education, and adult learning. Whereas research about the educational sector, together with state assessment, evaluation, and statistics, constitute knowledge for the development of educational policy, research for the education sector is mostly practice-oriented research directed at teachers and other educational practitioners. The ministry is therefore committed to making research for the educational sector useful and applicable for practitioners, but also to challenge and improve educational practice through research. Overall, the strategy aims to develop and strengthen dynamic, multidisciplinary research communities engaged in education, improve the quality and relevance of educational research, increase the international orientation, facilitate scientific renewal, encourage well-functioning dissemination of research results, and improve collaboration between research, education, the field of practice, and innovation in the educational sector.

According to the ministry, knowledge mobilisation requires key actors in educational research to collaborate effectively, and policymakers and practitioners to be able to access, interpret, and use research-based knowledge. Therefore, a key objective set out in the strategy is to make research-based knowledge and results from educational research easily accessible and applicable to policymakers and educational practitioners. With this strategy the ministry seeks to strengthen the dissemination of national and international research results and to encourage research that is specifically directed at educational practice.

In Norway there are several key players with diverse areas of responsibility and roles in the Norwegian system of educational research and development, including the Research Council of Norway (Norges forskningsråd).

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The Research Council of Norway
One of the primary aims of the Research Council of Norway is to facilitate and develop activities and meeting places where findings from educational research may be shared. This is mainly done through the ministry and the Research Council's Programme for Research and Innovation in the Educational Sector (FINNUT), which will be described later. The Research Council also finances and administers the Norwegian National Graduate School in Teacher Education (Nasjonal forskerskole for lærerutdanning (NAFOL)) and an associated research school called the National Graduate School in Educational Research (NATED), which offers specialised education and training in the fields central to educational knowledge, in order to strengthen a research-based perspective in, for instance, teacher training and primary and lower secondary school. Seven universities and seventeen university colleges (høgskoler) formed the NAFOL network, which started on 1 January 2010, and closed on 31 December 2016. The financial allocation for the entire period was NOK 40 million. In 2013 halfway evaluation of NAFOL's achievements in relation to the original objectives and to the call criteria was conducted in 2013 (Norges forskningsråd, 2013). All in all, this evaluation finds that NAFOL showed a high level of goal achievement. However, three factors of uncertainty were also identified – collaboration with the National Graduate School in Educational Research (NATED), vulnerability related to the replacement of people in leading managing positions and concern for what will happen after 2016 (Norges forskningsråd 2013: 11).

As mentioned earlier, the Norwegian Ministry of Education and Research considers knowledge mobilisation to be a very complex process that requires easy access to research and evidence, but also depends on the competence, capacity, and learning culture of those who are expected to use research-based knowledge. One central object of the ministry's strategy for educational research is to make research findings easily accessible and practicable to practitioners, among others, and therefore, in 2013 the ministry invested in the establishment of the Knowledge Centre for Education in order to facilitate the use of research and to get teachers, among others, to engage with evidence.

Knowledge Centre for Education (Kunnskapscenter for Utdanning)
The Knowledge Centre for Education[30] (Kunnskapscenter for Utdanning) is an independent research organisation established as a department of the Research Council of Norway in its Division for Society and Health (Norges Forskningsråd, Divisjon for Samfunn og Helse). The centre identifies, synthesises and shares research-based knowledge on issues of relevance to the entire educational sector, in order to improve teaching and learning across early childhood, school, vocational training and higher education, and to inform evidence-based

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[30] http://www.forskningsradet.no/prognett-kunnskapssenter/KSU/1247146831358?lang=no

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decision-making. Policymakers, researchers, and educational practitioners are the primary target audience of the Knowledge Centre.

According to the centre's webpage, its main tasks and responsibilities are:

- to generate an overview of national and international research;
- to synthesise and disseminate research that is relevant to the target audience;
- to contribute to knowledge-based policy development, management and practice, and to an enlightened and knowledge-based educational debate (Kunnskapssenter for Ut-danning, Norges Forskningsråd, n.d.-a).

Part of the centre's mission is thus to filter and provide high-quality evidence on, for instance, what does and does not promote excellence in schools, and to pass on that knowledge to different target groups, including teachers. Educational practitioners' commitment and ability to use research-based knowledge in their practice are important elements, which is why the Knowledge Centre focuses on questions of how research-based knowledge meets practitioners' experiences and becomes relevant to educational practice. In order to foster a general understanding of the practical use of research, the Knowledge Centre develops different formats for synthesised research, such as systematic reviews, but it is also committed to developing customised products for a specific use, such as recommendations for educational practice. In this way the Knowledge Centre ensures that different target groups can make use of the knowledge generated by the centre.

The Knowledge Centre handles a range of tasks, including producing systematic reviews and reports in standard formats, on educational topics such as teacher assessment, and partnership in teacher education. These reports are available for download in Norwegian on the centre's webpage. Besides producing their own reports, the Knowledge Centre also collects reviews and mappings from international collaborators, such as the EPPI centre at University College London, and makes these available in a knowledge database. Among other things, this includes creating summaries of available reviews, translations and adaptations of research reports, and brief reviews of available knowledge. The centre also presents the essential results of Norwegian and international educational research and identifies knowledge gaps in order to provide input to governmental bodies and researchers and to relevant research programmes at the Research Council of Norway. Finally, the centre creates meeting places for researchers, practitioners, and public authorities, for instance, by arranging conferences on current topics in education. According to the interviewee, The Nordic Institute for Studies in Innovation, Research and Education (Nordisk Institutt for Studier av

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Innovasjon, Forskning og Utdanning, NIFU) is currently preparing an assessment of how well the centre is achieving its objectives.

The knowledge database

As mentioned above, the Knowledge Centre's website is built around a database for research-based knowledge on education[31] (also called the knowledge database) which functions as a searchable central repository that gives policymakers, researchers, and practitioners the opportunity to find and download resources by keyword, educational level, or topic. The knowledge database is updated continuously and has three main aims:

- To provide a *knowledge status* through shorter texts that present an overview of the available knowledge within a specific educational topic. These overviews are presented by various university professors
- To provide *research and analysis*, primarily in the form of systematic reviews and research mappings. However, other forms of research and analysis that illustrate, complement, or contradict the findings of the reviews and mappings may also be included
- To provide *descriptions of practice* that include a diverse range of articles (e.g. interview, commentaries, videos etc.) that aim to connect relevant research-based knowledge with educational practice (Kunnskapssenter for Utdanning, Norges Forskningsråd, n.d.-b).

In 2015 the Knowledge Centre for Education received a grant of NOK 10,245 million beyond the national budget (Kunnskapsdepartementet, 2015a). Another essential instrument in achieving the objectives of the ministry's strategy for educational research is the Research Council of Norway's Programme for Research and Innovation in the Educational Sector (FINNUT).

Programme for Research and Innovation in the Educational Sector (FINNUT)

The Research Council's Programme for Research and Innovation in the Educational Sector (Program for Forskning og Innovasjon i Utdanningssektoren, FINNUT for short) is a long-term, policy-oriented programme designed to develop new knowledge for the entire educational sector, from early childhood education and care to higher education and adult learning. The programme was established in 2014 and will run for ten years (2014–2023). FINNUT includes efforts to develop productive, competent research communities that can generate high-quality educational research, relevant to the development of the sector over the long and short term. Among other things, the programme puts specific emphasis on knowledge communication and dissemination targeted at researchers, users of research, and the general public.

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[31] http://www.forskningsradet.no/prognett-kunnskapssenter/
KSUSok/1247146831408?lang=no&scope=ForskningOgAnalyse%2COverblikk%2CPraksis

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The Research Board of the Division for Society and Health (Divisjonsstyret for Divisjon for Samfunn og Helse) is generally responsible for the FINNUT, but the programme is headed by an appointed programme board, which acts on behalf of the Research Council of Norway (Norges forskningsråd). The programme is organised under, and reports to the Research Board of the Division for Society and Health, whereas the Research Council administration is responsible for the day-to-day operation of the programme.

According to the work programme, the FINNUT aims to develop knowledge of high quality and relevance for policy development, public administration, the field of practice and the individual, and to promote scientific renewal in research and innovation in the educational sector (Research Council of Norway, 2014). The programme provides funding for high-quality research and innovation activities and projects within and across selected thematic priority areas, such as learning processes, assessment forms and learning outcomes, and praxis, professional practice, and competence development.

Knowledge-sharing and dissemination are, among other things, critical tasks for the FINNUT programme, which makes an effort to ensure that the findings of research conducted under the programme are utilised. Responsibility for these efforts is shared among the projects funded under the programme, the programme board and the Research Council administration, and is carried out in collaboration with the Norwegian Knowledge Centre for Education (Kunnskapscenter for Utdanning), the Norwegian Directorate for Education and Training (Utdanningsdirektoratet) and other players in the educational sector. The programme's communication and dissemination activities are oriented towards relevant target groups, those being researcher-oriented target groups, user-oriented target groups such as educational practitioners, and the general public. Researcher-oriented dissemination in the form of articles in national and international journals, and participation in international research conferences is the responsibility of the projects, and the most important form of scientific publication.

In order to receive research funds from the FINNUT programme, a research and innovation project must present a separate, targeted plan for communication and knowledge-sharing, which must include dissemination activities directed at the research community. It is required that projects under the programme use established dissemination channels and arenas for dissemination of their research results, but projects are also encouraged to create new channels and arenas for knowledge-sharing and dialogue about educational research, and to integrate dissemination activities with other activities throughout the entire project period. Furthermore, the projects must emphasise user-oriented communication related to the field

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of practice, and use existing channels and networks in these efforts.

The FINNUT programme also helps to ensure that research projects under the programme are made known to the relevant target groups, for instance, by supporting the projects' dissemination efforts and helping to establish ties to key actors for cooperation, activities and meeting places where research results may be shared and discussed across projects and different target groups. An important partner in these efforts is the Knowledge Centre for Education. Among other things, user-oriented communication and dissemination targeted at educational practitioners is crucial under the FINNUT programme.

The FINNUT programme is funded by the Ministry of Education and Research and has an overall budget of roughly NOK 700 million for the 2014–2023 programme period, with an annual budget framework of roughly NOK 70 million. The programme prepares a plan for funding announcements that takes into account other national or international calls for proposals that overlap with, or share an interface with subject areas, research capacity, research needs, and the sector's potential and capacity to participate in the projects.
In addition to the Knowledge Centre for Education and the FINNUT programme, the Norwegian Directorate for Education and Training (Utdanningsdirektoratet) is also regarded as a key actor when it comes to conveying research findings to educational practice in Norway.

The Directorate for Education and Training (Utdanningsdirektoratet)
The Directorate for Education and Training[32] (Utdanningsdirektoratet) is a subordinate agency of the Ministry of Education and Research with responsibilities related to early childhood education and care, and primary and secondary education. The Directorate handles a broad range of tasks, from curriculum planning, examinations, and analyses to legislation and supervision of Norway's school owners, such as municipalities and county authorities. The Directorate also provides support to schools, continuing education for teachers, and development of educational resources.

The Directorate also plays a central role when it comes to implementation and follow-up of evaluation and research. The Directorate is responsible for development projects, research and statistics on primary and secondary education, and for coordinating international studies and surveys such as PISA. In order to develop and improve the quality of primary and lower secondary education in Norway, the Directorate provides feedback to schools and the authorities, for instance those based on user surveys of students and teachers. The Directorate is responsible for disseminating research and statistics that are relevant to policy

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[32] http://www.udir.no

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development and practice in the educational sector. Results and analyses are published on the Directorate's website.

National centres in education
Ten national educational field centres have been established under the Directorate for Education and Training, whose audience includes teachers, school principals, and local authorities. According to the regulatory letter of 2015 (Utdanningsdirektoratet, 2014) the individual centres are responsible for disseminating research within their areas, and accordingly they share examples of practice regarding what works in primary and lower secondary education, for example. The centres offer support and guidance to local authorities in connection with the planning and execution of quality improvement, and they also initiate collaborations with local authorities, and the university and university college sector/teacher education programmes, in order to develop plans and models for implementing research on what works.

As research-based knowledge is regarded as an important basis for the development and improvement of the quality of the educational sector, the centres are expected to know about, and to use, relevant knowledge of education, such as evaluations, research studies and statistics. The centres also have the particular responsibility for collecting, systematising and disseminating findings from research and innovation work within the educational sector, and contributing to research and analysis tasks commissioned by the Directorate (Utdanningsdirektoratet, 2014: 17).

Research conducted under the auspices of national centres is available on the individual centres' web pages.[33] For instance, the Norwegian Centre for Learning Environment (Læringsmiljøsenteret) and Behavioural Research in Education, which is a part of the Faculty of Arts and Education at the University of Stavanger, has recently launched a research project called classroom interaction for enhanced student learning (Klasseleiing – teori til praksis), CIESL for short, investigating the implementation of classroom management at schools participating in the national initiative, Developing Secondary Schools (Ungdomstrinn i utvikling). A key objective of this project is to develop knowledge about how teachers transfer research-based knowledge to their teaching practices. Another goal is to examine how organisational factors may promote or hinder the implementation of new knowledge. The project is a cooperative partnership between University of Stavanger and Telemark University College, and it is funded under the FINNUT programme (Læringsmiljøsenteret, 2015).

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[33] http://www.udir.no/Stottemeny/Om-direktoratet/Organisasjon/Nasjonalesentre

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The Udir magazine

The Directorate for Education and Training publishes an annual magazine called Udir, especially aimed at teachers, school principals and school owners, and in which the Directorate's ambitions and specific initiatives are presented along with information about political strategies that concern education and articles in which teachers, school principals, and other educational professionals share experiences and knowledge about effective practices. Continuing education and further training of teachers and school principals is also in focus, as the magazine includes a guide to how to apply for continuing education and a full catalogue of available further training courses, among other things. The two most recent issues of Udir magazine are freely downloadable from the Udir web page.[34]

Other key players

On the local level the County Governors (fylkesmannen), the County Councils (fylkeskommunene) and the municipalities have become important players in the dissemination of educational research, partly as contracting authorities, and partly as users of research and evidence, but also as the authority responsible for continuing education and teacher competence development. Therefore, the County Governors, for instance, are increasingly making use of research-based knowledge.

Independent research institutes, and the universities and university colleges (høgskoler) in Norway are also key players in the context of educational research and development, as they are responsible for conducting research and innovation, among others things. In this way they are also important collaborators with national, regional and local authorities when it comes to improving the quality of the educational sector and constituting research-based knowledge for the development of educational policy. However, when it comes to the dissemination of research-based knowledge, the ministry has no formal or systematically established collaborations with universities, university colleges, or other research units. Besides the key players mentioned, there are several individual operators/consultants in the area of knowledge communication and dissemination. According to the ministry there are two types of individual operators: those working with school improvement and professional development, and those working within specific school subjects (mathematics, Norwegian etc.). However, the ministry knows little about these operators, how many there are, what they do, and the quality of their work.

In Norway teachers are encouraged and expected to familiarise themselves with evidence and to use research or research-based knowledge in their practice, but it is not legally required

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[34] http://magasinet.udir.no/2016

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that they do so. Neither is it required that commissioned research be published for use in practice in easy, accessible, and applicable formats, however it is requested that researchers consider the users of the research when they present their research findings. According to the Ministry of Education and Research, textbook authors and publishing houses in the educational field play an important role in getting research findings to educational practitioners, such as teachers.

Economy and funding

In Norway educational research is mainly financed by public funds. The Nordic Institute for Studies in Innovation, Research and Education (NIFU) reports that 84 per cent of educational research is described as being funded by the public sector, while only 3 per cent is funded by industry, other national funds, or foreign funds. Information on funding is missing for thirteen per cent of educational research and development expenses (NIFU, 2015: 25–26). Thus the Norwegian Ministry of Education and Research (Kunnskapsdepartementet) commissions, funds and applies research in order to provide evidence-based policy and practice in the educational sector (NIFU, 2015: 11). According to NIFU the ministry has increased its transfers of funds to the Research Council of Norway (Norges forskningsråd) from 47 million NOK in 2008 to about 80 million NOK in 2013 (NIFU, 2015: 13).

According to the interviewee, no funds are earmarked for the use of research in primary and lower secondary schools at the national level. On regional and local levels there may be, but this has not yet been systematically investigated by the ministry. Overall, educational research in Norway either takes the form of long-term projects (mainly funded by the Research Council of Norway) or smaller, commissioned research projects. Universities and university colleges in Norway usually receive public funding, partly from basic funds, and partly from external grants for commissioned tasks. According to NIFU, results from educational research in Norway are communicated through a range of Norwegian organs, such as scientific journals, anthologies, and books. In 2011–2013 more than half of the scientific publications were published in Norwegian. A large proportion of the educational research is published as book chapters/anthologies and monographs, which are largely aimed at a Norwegian and Nordic audience. However, NIFU does not report whether these research results actually reach the users or whether the users apply this new knowledge in their practice (NIFU, 2015: 107).

Teacher education programme

In Norway a range of universities and university colleges offers a variety of teacher education programmes. However, new higher education structures are currently being implemented

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in Norway, which is ultimately leading to a reduction in the number of higher education institutions. Still, teacher education in Norway is a highly diversified field, as there are several routes to becoming a teacher:

- The general teacher education (grunnskolelærerutdanning, GLU) is a four-year programme that qualifies graduates to teach grades 1–7 or grades 5–10 in the Norwegian school system and in adult education
- The integrated master's degree (integrerte lektorutdanning for trinn 8–13) is a five-year programme that qualifies graduates to teach grades 8–13 in the Norwegian school system
- The subject teacher education (faglærerutdanning i praktiske og estetiske fag) is a three-year programme that qualifies graduates to teach practical and aesthetic subjects in primary and lower secondary schools, in upper secondary school, for adult education, and for cultural work with children and adolescents
- The vocational teacher education programme (yrkesfaglærerutdanning (YFL)) qualifies graduates to teach in the upper secondary school, adult education, and school subjects from the fifth year of primary school. This is a three-year programme
- The practical pedagogical education programme (praktisk pedagogisk utdanning (PPU)) is a one-year course for students who have completed the required studies in the Humanities, Social Sciences, or Natural Sciences at a university or university college. The PPU programme qualifies graduates to teach grades 5–13 in the Norwegian school system and in adult education
- The practical pedagogical vocational education (praktisk pedagogisk yrkesutdanning (PPU-Y)) is a one-year course in educational theory and practice for vocational teachers. This programme qualifies graduates to teach grades 8–13 in the Norwegian school system.

The overarching purpose of the various teacher education programmes is to provide teachers with a specialisation in specific school subjects or specific areas of education. However, teacher education in Norway is currently undergoing significant changes.

In 2014 the Norwegian government launched the "Promotion of the status and quality of teachers: joint effort for a modern school of knowledge" (Lærerløftet: på lag for kunnskapsskolen) (Kunnskapsdepartementet, 2014) strategy. A key objective of this strategy is to raise the quality of teacher education and thereby ensure that newly qualified teachers are better prepared for their jobs. This means that a five-year master's degree for teachers will be introduced in Norway starting in 2017.

According to the ministry, the content of the teacher education programmes should build on updated research-based knowledge, be accompanied by scientific method and oriented

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towards innovation and the development of the teaching practice and profession. In theory, teacher education in Norway is research-based and student teachers are expected to develop an independent, analytical, and exploratory attitude to their own and others' teaching practices. One reason for making teacher education a five-year master's degree programme is to lay an even better foundation for a research-based teaching profession.

All Norwegian universities, special field universities, university colleges and institutions with single higher education programmes may be accredited by the Norwegian Agency for Quality Assurance in Education (Nasjonalt organ for kvalitet i utdanningen) (NOKUT), which is the controlling authority for educational activity in Norway. An accredited higher education institution is granted the right to offer educational provision, without having to apply to NOKUT for specific (programme) accreditation, in accordance with the powers that its institutional category implies. University colleges without institutional accreditation must apply to NOKUT in connection with all new programmes, accredited university colleges must apply to establish master's and PhD programmes, and universities have the authority to self-accredit programmes of study at all levels (NOKUT, n.d.).

Further teacher training: skills development and seeking new knowledge

In Norway, the central government has a strong ambition to increase the number of teachers taking further training. Therefore, continuing education for teachers is both a key objective in the government's promotion of the status and quality of teachers (Lærerløftet) (Kunnskapsdepartementet, 2014) and a major financial priority of the government.

In the 2015 national budget the government earmarked over NOK 1.2 billion for teacher training and continuing education, in order to help all teachers in Norway to obtain the qualifications they need in the years to come. Continuing and further education of teachers is the government's most significant investment in the field of education and research. This heavy investment means that more teachers now have the opportunity to further educate themselves. Starting in autumn 2015, five thousand and fifty teachers are being offered places in further training courses provided by universities and university colleges in Norway. The overarching goal of investing in continuing education for teachers is to increase the teachers' professional insight and skills in particular areas. Therefore, the government has also introduced new qualification requirements for all teachers who teach mathematics, English, and Norwegian. That means that teachers must be specialised, in order to live up to these requirements and in order to teach these school subjects (Kunnskapsdepartementet 2014: 24–25).

In addition to the earmarked funds, in 2014 the government established substitute teacher

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arrangements along with a new grant scheme for teachers participating in continuing education. Through the established substitute teacher arrangements, the government provides a grant of 75 per cent of a full-time position for further training in mathematics and science, and 60 per cent for further training in other school subjects. Through the grant scheme, teachers furthering their education, preferably within the fields of mathematics and science, receive a NOK 100,000 grant. In both arrangements the government finances teachers' further and continuing education courses at universities and university colleges, while the local authorities that are responsible for the schools cover expenses associated with travelling, accommodation, teaching materials and the like (Kunnskapsdepartementet, 2014: 26).

Both the foregoing arrangements are based on the Ministry of Education and Research's strategy for continuing education for teachers and school principals in 2012–2015 (Kunnskapsdepartementet, 2011). The objectives of this strategy have been carried on in a new strategy for continuing education, *Competence for Quality* (Kunnskapsdepartementet, 2015b), which was launched in 2015. The goal of this strategy is to increase student learning outcomes.

The new strategy on continuing education for teachers and school principals spans ten years, and there is a clear ambition for teachers' further education to be a permanent focus, so that the planning of further education at the schools, and the development of training courses at the universities and university colleges has a long-term perspective. The strategy was developed in collaboration with the Ministry of Education and Research (Kunnskapsdepartementet), The Norwegian Association of Local and Regional Authorities (Kommunesektorens organisasjon, KS), Union of Education Norway (Utdanningsforbundet), Norsk Lektorlag, Skolenes Landsforbund (SL), Skolelederforbundet and Nasjonalt råd for lærarutdanning (NRLU). In order to ensure continuity in the implementation of the strategy, all partners involved meet on a regular basis in order to evaluate the implementation process and to make adjustments and set future priorities.

According to the Norwegian Directorate for Education and Training, surveys show that both teachers and school principals are very satisfied with the further training courses offered. Furthermore, there is widespread consensus among teachers and school principals that highly skilled teachers are extremely important to student learning outcomes (Utdanningsdirektoratet, 2015).

Experiences: Successes, challenges, and lessons learned
In closing, the interviewee was asked to elaborate on the Ministry of Education and Research's experiences of knowledge mobilisation in primary and lower secondary education,

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for instance, what promotes or hinders the use of research, and the teachers' general attitudes towards using research-based knowledge in their practice.

According to the interviewee, concrete research on Norwegian teachers' use of research and evidence is seldom conducted. However, some years ago a four-year research project called Professional Learning in a Changing Society (Profesjonslæring i endring), or ProLearn, was conducted. This project targeted four professional groups – nurses, teachers, accountants, and computer engineers – and investigated views on professional development and motivational structures in the use of expert knowledge bases among the different professional groups. A characteristic feature of the targeted professional groups is that they have emerged from a practice-based Norwegian tradition, and therefore do not have the strong academic background of professions such as law or medicine. While the study showed that all groups had adapted to the rhetoric of the knowledge society, by addressing the need to continuously renew their knowledge base, the results also indicated that teachers stand out as being the least concerned with acquiring new knowledge, in comparison with nurses, accountants, and computer engineers. Overall, teachers are more preoccupied with knowledge based on experience from practice than research-based knowledge. Therefore, teachers tend to seek colleagues' experiences and advice rather than researchers' considerations, analyses and recommendations for practice (Jensen, 2007, Jensen et al., 2008). A few other studies that have explored Norwegian teachers' relationship to research and knowledge show similar results (Afdal & Nerland, 2014; TNS Gallup, 2008).

Because Norwegian teachers are often very busy, they feel a strong need to know that possible changes in their teaching practice will definitely have a positive impact on, and lead to better student outcomes if they are to start using new methods. In other words, teachers want to be sure that the methods applied really work, to be willing to adopt an evidence-based approach to change.

According to the interviewee, a considerable barrier is that educational research to has not been preoccupied with practice-based challenges in schools, such as differentiation in schools, school management and feedback. In other words, much educational research has had no or little bearing on the "real world" of classroom practice, which may explain why teachers in Norway sometimes lack motivation to use research and evidence. Because the learning culture among Norwegian teachers is largely rooted in a practice-oriented tradition, and because educational research has had little focus on effective teaching practice, only few places have developed a strong academic learning culture and succeeded in making use of research a natural part of the teaching practice.

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Ontario, Canada

Policy framework

Canada consists of ten provinces and three territories, and Ontario is the most populous of the ten provinces, with an estimated population of 13.7 million (Ontario Ministry of Finance, 2016). Canada has two official languages, English and French. According to the 2011 census, approximately four per cent of the Ontario population speaks French as their mother tongue, and eleven per cent are bilingual, speaking both English and French (Lepage & Corbeil, 2013). In Canada, education from Kindergarten to Year 12 is under provincial jurisdiction, which means that education in Ontario is the domain of the Ontario Provincial government, not the Canadian federal government.

Structure of primary and lower secondary education

According to the Ontario Education Act of 1990 (Ontario Government, 2015) education in Ontario is compulsory between the ages of six and eighteen, and a child of compulsory education age must be enrolled at a public school, a separate school (Roman Catholic or Protestant schools), an independent (private) school or registered for home-schooling. All publicly funded elementary and secondary schools are administered and controlled by the Ontario Ministry of Education, whereas private schools are independent of the ministry and operate in accordance with the legal requirements established by the Education Act. As of 2014–2015, there were 3,974 elementary and 919 secondary schools in Ontario, including public and separate schools (Ontario Ministry of Education, n.d.-a). There are some nine hundred private schools in Ontario, and none of these schools receive government funding (CIS Ontario, n.d.).

Within the Ontario Ministry of Education, there are 73 district school boards administering the educational programmes. Twelve of these are French-language, with over 425 French-language schools. In these schools the curriculum is taught exclusively in French, with the exception of English-language courses (Ontario Ministry of Education, n.a.-b). Several years ago the district school boards were very autonomous, and the role of the ministry was to distribute money and to develop a national curriculum. Today the district school boards are less autonomous, owing to legislative changes. The curriculum in Ontario is still nationally developed, but has varied in detail over the years. The current curriculum is perceived as flexible, as it sets out what students should be taught and achieve as they progress through school, however it only suggests how this should be done. This means that the Ontario school boards, together with principals and teachers in Ontario schools, have the power to determine the pedagogy and how the curriculum will be delivered in the schools.

Political strategies and initiatives

The Ontario Ministry of Education has a strong focus on being evidence-based in their decisions, policies and educational programmes, and they have a variety of strategies for promoting the use of research-based knowledge and knowledge mobilisation in the educational system. Across the ministry there are several branches or divisions that use research and evidence-informed school practices in different ways. However, the development of the Research and Evaluation Strategy is a key ministry initiative (Ontario Ministry of Education, 2012) that was launched in 2012.

The Ontario Ministry of Education's Research and Evaluation Strategy

The Research and Evaluation Strategy is a shared strategy designed to include staff from all parts of the ministry and to foster collaboration with partners across the educational and research communities. According to the Ontario Ministry of Education's webpage, the Research and Evaluation Strategy comprises:

- leading the ministry's research agenda to coordinate and manage ministry research activities to support provincial educational goals
- applying research and evaluation to support evidence-based policy and programme decisions and practices
- building individual and organisational capacity to access, use, and conduct research
- fostering research collaboration through networking and partnerships between and among ministry staff researchers and educators across Ontario, to address priority research needs
- communicating information about existing and new research activities and findings
- contributing to the provincial, national and international bodies of research-based knowledge about educational policies, programmes, and practices (Ontario Ministry of Education, n.d.-c).

The ministry's Research and Evaluation Strategy seeks to engage teachers in connecting research to teaching practice and to support collaboration with key players across the education and research communities. A range of initiatives based on this strategy is described in the following section.

Specific initiatives connected to the Research and Evaluation Strategy

The Ontario Ministry of Education organises a variety of specific initiatives that aim to support knowledge mobilisation in the educational system, and the ministry shares all the findings of their work through publications, monographs or multimedia resources, or through activities or events.

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A key ministry task is the support of research-informed practices at school and classroom levels. In doing so, the ministry has adopted two different approaches to knowledge mobilisation. One is designed as a peer-reviewed model of research that the ministry believe teachers should be interested in and read about. That is *What Works? Research into Practice*,[35] which is a series of research summaries written by scholars at Ontario universities and are published by the Literacy and Numeracy Secretariat under the ministry, in order to help school practitioners put the best evidence-tested ideas into practice at the school and classroom levels. The other approach is based on field knowledge of what teachers and principals are already preoccupied with and interested in doing better. That is the *Capacity Building Series*.[36] These monographs are developed on the basis of the experience that most teachers are interested in learning *how* research is relevant to their daily teaching practice. Therefore the ministry started gathering information from the educational field by asking school practitioners to identify and articulate specific practice-related problems, so the ministry may consult the research literature and provide teachers and principals with the best available research that is applicable in a classroom setting. Using this gathered information, the ministry produces the Capacity Building Series, which is about research and practical strategies on key topics of interest in the field of education, written in short, easy-to-read formats. The idea behind these monographs is that they are pitched just a step ahead of where the teachers are. Usually the uptake of the individual monographs of the Capacity Building Series depends on how well the ministry has been able to pitch that. The ministry also shares their research and evaluation in other short, easily-understood formats, such as their *Research in Brief*, which may be downloaded from the ministry's website.[37] These publications are specifically aimed at teachers and principals in order to support leadership and instructional effectiveness in Ontario schools.

The Ministry of Education publishes all their tools and monographs, and all are available on their website. The ministry also monitors who is downloading their publications, which shows that their monographs are being widely used. Also, school boards may order hard copies of the Capacity Building Series, which means that the ministry can also monitor which monographs are the most popular.

Below are descriptions of other ministry initiatives connected to the Research and Evaluation Strategy, some of which some promote networking and collaborative partnerships among researchers and school practitioners.

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[35] http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/whatWorks.html
[36] http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/capacityBuilding.html
[37] http://www.edu.gov.on.ca/eng/research

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Learn Teach Lead and EduGAINS

Learn Teach Lead[38] and EduGAINS[39] are both websites primarily targeted at practitioners at the school and classroom levels, such as teachers and school principals. Here, school practitioners may find the resources developed by the ministry, such as video resources, publications, and webinars on key topics in education. School practitioners may also use Learn Teach Lead and EduGAIN to connect with other practitioners to share effective teaching practices.

The Ontario Education Research Symposium

The ministry is also working to facilitate collaboration among teachers, researchers and other players in education, and to engage each of these groups in connecting research to policy, programmes, and practices. Each year the ministry organises the Ontario Education Research Symposium in order to support teachers, researchers and policymakers in building networks and partnerships, and to provide a setting where research-based knowledge and different approaches to connecting research to practice may be shared and discussed. The symposium is funded by the government of Ontario and it was launched in 2006.

TeachOntario

Another initiative that aims to support collaboration, practice sharing and knowledge exchange among teachers in Ontario is the online communication platform called TeachOntario,[40] which was developed by TV Ontario (TVO) in collaboration with the Ontario Teachers' Federation (OTF) and the Ontario Ministry of Education. Here, teachers across Ontario can come together to discuss problems of practice and to share evidence-based practices by writing blog posts, uploading videos and artefacts from their classroom, and to start an online community based on subject matter, grade, or interest. Unlike most social media communication platforms, although any member of the public may view and explore the site, access to sharing and creating collaboratively is restricted to people with an Ontario school board or faculty of education email address.

The Ontario Education Research Panel

In 2006 the ministry established The Ontario Education Research Panel (OERP),[41] in order to promote activities within and across sectors of the Ontario educational communities, and to facilitate and strengthen relationships and collaborations among teachers, researchers, professional organisations, and the ministry. The OERP is also focused on mobilising knowledge gathered through research and evaluation and on engaging school practitioners in the effective use of evidence, for instance, through a series of video stories of collaborative research

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[38] http://learnteachlead.ca
[39] http://www.edugains.ca/newsite/HOME/index.html
[40] https://www.teachontario.ca/welcome
[41] http://www.edu.gov.on.ca/eng/research/OERP.html

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called Partnership Case Studies which promotes effective examples of research-to-practice already developed at the school and classroom levels (Ontario Ministry of Education, n.d.-d).

The Student Work Study Teachers initiative
The Student Work Study Teachers (SWST) initiative is a professional learning programme that supports teacher inquiry into student learning. It is developed and funded by the ministry, and structured around a collaborative study between an experienced teacher working in a temporary research role, called a Student Work Study teacher, and a hosting classroom teacher. The SWST initiative is engaged in understanding each student's learning and instructional needs, using student activity in classroom contexts as the primary source of information to inform immediate classroom actions and build systematic knowledge through reflective classroom practice. However, it primarily aims to improve the instruction of students who are not progressing as expected. The Student Work Study teacher is trained in classroom inquiry and researcher-practitioner roles by ministry staff. The role of the Student Work Study teacher is to work in the classroom with a host teacher, to observe over time and to interact with students who are underachieving. In this work the student response to class-room practice and instruction is especially important. Eventually the ministry produces and shares a synthesis based on the teachers' reflections and learning. The SWST initiative was launched in 2009 (Curriculum Services Canada, 2012, Campbell, 2014: 41–47).

The Early Primary Collaborative Inquiry
The Early Primary Collaborative Inquiry (EPCI) is another ministry initiative encouraging teachers to engage in a collaborative inquiry into teaching and learning within the context of early primary education (K-2). This project spanned five years, and ended in 2013. The aim of the Early Primary Collaborative Inquiry was to highlight evidence-informed teaching and learning practices that support young learners, to build connections to programming decisions for grades 1 and 2 and to explore the common context of these years (Ontario Ministry of Education, n.d.-e, Campbell, 2014: 34–40). Basically, each district school board had an EPCI team, ideally including teachers from the relevant grades, a principal, an early years curriculum leader or consultant, a supervisory officer, and sometimes a researcher. Each team would participate in classroom-based inquiry to "inquire" into their teaching and learning practices, and to consider how evidence-informed instructional approaches articulated in ministry documents may be implemented in K-2 classrooms. In doing so they formulated a question, gathered academic research and did classroom-based research, and eventually each team developed a monograph on what they had learned, so others could learn from their experience. The ministry's Research Team and Capacity Building Team would support each team along the way by being a critical friend. It was hoped that after

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five years, each team would have built enough capacity to continue the collaborative inquiry work on its own.

Other initiatives
Through the above-mentioned projects and initiatives, the ministry hopes to influence how school practitioners think about research, in order to make it natural and easy for teachers to look for effective and evidence-based practices to explore, and to use not only research from outside, but also their own data collection. Basically, what the ministry has done is to focus on professional learning in classrooms, enabling teachers to identify their problems of practice and articulate what could be better, and then building from there. The teachers' professional learning through practice is considered to be research that can inform the teaching practice. The next step is to consult the research literature in order to find out what is already known, and this is how educational research is brought in.

The use of research in schools is also highlighted in the standards of practice for the teaching profession developed by the Ontario College of Teachers (Ontario College of Teachers, n.d.-a). The standards of practice is a framework of five standards that identifies the competencies that are expected of teachers in Ontario schools. In other words, this framework identifies the knowledge, skills, and values inherent in the teaching profession, and therefore, the standards of practice are meant to guide the daily practice of Ontario teachers. Even though this means that using research is becoming increasingly prevalent in Ontario schools, as teachers are encouraged and expected to use research and evidence in their teaching practice, there is no legal requirement to do so. However, the teacher performance appraisal (TPA) process is built on the standards of practice, which specifically refers to use of educational research in relation to the standards of professional knowledge and ongoing professional learning. Use of research as evidence of professional learning is modelled in the Technical Requirements Manual for the TPA (Ontario Ministry of Education, 2010).

Whether commissioned research is published for use in practice tends to depend on the specific contract between the ministry and research units, and also whether the research is intended for external or internal use. However, there is no legal requirement for commissioned research to be published in easy, accessible, and applicable formats. The ministry does a lot to translate research into practice for school practitioners by writing papers and presentations that summarise key research, in order to present and share it at various international conferences and forums for teachers and other school practitioners.

The previous section made it clear that the Ontario Ministry of Education finances and subsidises a range of initiatives related to the use of research in schools. Besides providing

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funding to a broad range of initiatives that support knowledge mobilisation to elementary and secondary schools, the ministry has partnered with various universities in order to support their efforts to develop and implement policies, programmes and practices that are evidence-based and research-informed. The Knowledge Network for Applied Education Research (KNAER)[42] is one of these partnership agreements.

The KNAER was launched in 2011 as a collaborative partnership between the ministry, the University of Toronto, and the University of Western Ontario. One goal of the KNAER is to build the capacity to do the ongoing work of research mobilisation. The network is engaged in building and applying evidence of effective practices by conducting research, synthesising state-of-the-art knowledge from existing bodies of evidence. It also acts as a "knowledge broker" to facilitate evidence through networks across Ontario's policy, education, and research communities as it engages in a dialogue with groups of policymakers, school practitioners and researchers working collaboratively to connect research to practice. The work being done under the KNAER is funded by the Ontario Ministry of Education.

The KNAER provides syntheses of ongoing research relevant to K–12 education. The work of the KNAER has a broad scope and distribution, as projects span many different areas of education. Since the network launched, 44 different projects have been approved and completed, and a total of some $2 million in project funding has been allocated by the Ministry of Education (Levin et al., 2011).

The KNAER also makes an effort to develop deeper understanding of, and the capacity to mobilise, research knowledge across Ontario by creating a variety of support material for projects to use, so that new knowledge may be better incorporated into classrooms to the benefit of the students. For instance, the network maintains a "Project Resource Toolkit"[43] in which teachers, parents, researchers and so on may find the many resources created by the KNAER projects. The toolkit is searchable by type of resource, keyword, or theme, such as Research and Evidence Use, and professional development.

Based on another initiative run by the ministry – the Small and Northern Boards initiative – the ministry has also partnered with the Jackman Institute, which is associated with the Faculty of Education at the University of Toronto. Through the Small and Northern Board initiative the ministry provides funding to hire a numeracy facilitator for those small, northern boards of Ontario that are not able to hire a mathematics or numeracy consultant out of their own budget. The numeracy facilitators work with classroom teachers in their

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[42] http://www.knaer-recrae.ca/index.php
[43] http://www.knaer-recrae.ca/project-resource-toolkit

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district school board to develop professional learning and mathematics practices in class-rooms (Campbell, 2014: 29–30). Together with the ministry's research team, the Jackman Humanities Institute is tracking the progress of grade 6 students in the small and northern boards, in order to see whether there is marked student improvement based on the Small and Northern Board initiative.

Teacher education programme

In Ontario there are thirteen publicly assisted faculties of education that offer a variety of teacher education programmes in a variety of ways. Thus there are several routes to becoming a teacher in Ontario. However, ITE is undergoing significant changes. As of September 2015, the Initial Teacher Education (ITE) programme at Ontario's faculty of education has expanded to four semesters and includes twice the amount of practice teaching time (80 days, up from 40), and greater attention is paid to special education, students' mental health and wellbeing, how to teach with technology, and diversity, among other core elements (Ontario College of Teachers, 2015a).

In Ontario, future teachers will need to meet different sets of requirements within the ITE programme. Students need a high school diploma and an undergraduate degree, earned either concurrently with, or prior to embarking on a Bachelor of Education. Only teacher candidates in technological education may use work experience to meet the requirements. However, good marks alone will not necessarily guarantee you entry to a teacher education programme. A few faculties rely solely on academic records, although most require applicants to provide written submissions outlining their understanding of teaching, learning, and inclusion. Some others require applicants to sit for an interview. Some have a points system that weighs marks and volunteer experience. Each year, many teacher candidates apply to a faculty of education, which makes teaching a highly competitive profession. In Ontario the teaching profession is regarded as highly efficacious and desirable.

To teach at the elementary and secondary levels, students need to have completed at least three years of full-time study at university, leading to a post-secondary degree (e.g. a BA or a BSc). Students also need four semesters of post-secondary study leading to a Bachelor of Education degree (or equivalent). However, a post-secondary degree is not necessarily required for entry into technological education, but students must have five years of work experience in the teacher's field of technological education (not as a teacher), or a combination of work and post-secondary study. Nor do teachers of First Nations ancestry or aboriginal languages necessarily require a post-secondary degree.

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Elementary and secondary schools in Ontario are divided into four age levels: Primary (junior kindergarten to grade three), Junior (grades four to six), Intermediate (grades seven to ten) and Senior (grades eleven and twelve). Teachers at the primary and junior levels (kindergarten to grade six) are expected to teach many different subjects. To teach at the intermediate level (grades seven to ten), you need to be qualified to teach at least one subject at this age level. To teach at the senior level (Grades eleven and twelve), you need to be qualified in at least two subjects at this age level (Ontario College of Teachers, 2015a, Ontario College of Teachers, 2015b).

In Ontario, teachers must also be certified by the Ontario College of Teachers in order to teach in elementary and secondary schools. Teachers may earn their certification after they have gained their teaching qualification, and certified teachers pay an annual fee to maintain their membership and certification.

The Ontario College of Teachers also accredits all ITE programmes offered by Ontario's faculties of education. Accreditation is granted to an education programme that meets or exceeds the requirements outlined in Ontario Regulation 347/02 (Ontario College of Teachers Act of 1996, 2015). To be accredited as a teacher education provider you must present an education programme that addresses how teachers may use research in their teaching practice. With the new teacher education programme of September 2015, the research element of teacher education has become even more definite, for instance, the use of educational research and data analysis has been an explicit part of the programme. As stated in the Accreditation Resource Guide (Ontario College of Teachers, 2014), teacher education programmes must prepare the students to use current research in teaching and learning. The inclusion of content involving the use of educational research and data analysis is intended to highlight future teachers' utilisation of existing research literature and research results, or results from using diagnostic tools, for example, to determine practices and next steps in order to facilitate student learning. The intent is for future teachers to see themselves as active, inquiring professionals continually refining planning, instruction and assessment based on data. The ongoing cycle of reflective inquiry includes questioning, observing, consulting other data sources, reflecting, interpreting, and intervening instructionally or through assessment. Thus the ITE programme will enable future teachers to acquire the knowledge and skills to access, interpret, evaluate, and use educational research literature, to interpret large- and small-scale assessment data to make informed decisions about its usefulness in a particular context, and to collect and use data in conjunction with other information and knowledge to make instructional decisions to facilitate learning. The different faculties of education manage teacher education in various ways, which means there are also a variety

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of ways of demonstrating that students have had the opportunity to acquire knowledge and skills related to this component of research use.

Further teacher training: skills development and seeking new knowledge

As of the beginning of the 2006–2007 school year all new teachers certified by the Ontario College of Teachers who are hired for permanent positions by a school board, school authority or provincial school are required to participate in the New Teacher Induction Programme (NTIP) (Ontario Ministry of Education, n.d.-f). This programme provides another full year of professional support. The NTIP comprises elements such as mentoring for new teachers by experienced teachers and professional development and training appropriate for new teachers. In accordance with the Education Act all new teachers are required to have two performance appraisals conducted by principals in the first 12 months after they begin teaching. Key components of the teacher performance appraisal system include classroom observation of the teacher, and appraisal meetings that promote professional dialogue between the principal and the teacher. If both appraisals result in "Satisfactory" ratings, no further appraisals are required for the NTIP. For new teachers who do not obtain two "Satisfactory" appraisal ratings within the first year, the programme continues into the second year, to provide additional support. Experienced teachers must be appraised once every five years. The appraisal process for new teachers focuses on a subset of eight of sixteen competencies in five domains, such as professional knowledge and teaching practices, whereas experienced teachers are appraised for all sixteen competencies, of which engaging in ongoing professional learning is one (Ontario Ministry of Education, 2010, Ontario Ministry of Education, n.d.-g). Ongoing professional learning is an integral part of the professional standards developed by the Ontario College of Teachers (Ontario College of Teachers, n.d.-b), and both new and experienced teachers often take additional qualification courses. Additional qualification courses are offered by providers all over Ontario, such as faculties of education or district school boards, but the content is based on guidelines developed by the college. There is a wide variety of additional qualification courses and programmes available to teachers, from one-session courses to specialisation courses, but the college requires all courses have an element of research, although at different levels, depending upon the level of additional qualification. This means that there is a heavier emphasis on use of research in specialisation courses than in other additional qualification courses. The Ontario College of Teachers approves the providers of additional qualification courses, accredits the courses, and records a successfully completed qualification on a member's teaching certificate.

The Teacher Learning and Leadership Programme

In 2007 the Ontario Ministry of Education launched the Teacher Learning and Leadership

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Programme (TLLP), which is an annual project-based professional learning opportunity for experienced classroom teachers (Ontario Ministry of Education, n.d.-h). The programme is a joint initiative through a partnership between the Ontario Teachers' Federation and the ministry. It is meant to support and deepen teacher learning by funding proposals from teachers for self-chosen topics and activities in areas that are meaningful to them, foster teacher leadership and facilitate the sharing of exemplary practices with others for the broader benefit of Ontario's students. The focus of the TLLP is to provide an opportunity for knowledge production that is developed by experienced teachers and connected to their "real world" of classroom practice. Each school year teachers may submit project proposals individually or as a team, which will be reviewed at the board and provincial levels. At this point, almost all projects consist of teams of teachers and other school practitioners (e.g. educational assistants and principals), whereas there are very few projects with individual teachers.

A TLLP project could involve the implementation of innovative classroom strategies and publication of the outcomes in a professional magazine. However, all projects basically explore evidence-based practice in the way that it builds on the research and expertise developed for the Working Table on Teacher Development (Ontario Ministry of Education, 2007), and includes an approach of continual gathering, adapting, and reflecting on evidence and learning as you go. Thus each TLLP project may be seen as a research built into the work of the teachers, as teachers are also making an effort to collect their own data.

Each teacher or team has a full year to complete the chosen project. To follow up, each year the ministry organises the TLLP Sharing the Learning Summit where teachers present their completed projects and discuss their experiences with other participants. However, the ministry has found that many of the TLLP participants continue to work on their projects, and that several projects have been taken up by other schools. Previous recipients of TLLP funding are able to apply to the Provincial Knowledge Exchange (PKE), which provides a funded opportunity to access the learning of previous TLLP projects by connecting past TLLP participants with interested school or board learning teams. In this way, effective practices may spread from one school to another.

Since its launch, the TLLP has funded over seven hundred project proposals from experienced classroom teachers. The funding available per project depends on the scope of the activities of the proposed project, thus there is no set maximum amount of funding available per project. However, funding must be tied to the project's learning and sharing goals (Ontario Ministry of Education, n.d.-i).

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A research report on the TLLP (Campbell, Lieberman & Yashkina, 2013) shows that teachers are generally enthusiastic about the TLLP professional learning experience, and that the programme has been very successful in supporting and developing self-directed professional learning for experienced teachers. More information about the programme is available on the ministry's TLLP website[44] and the TLLP Ning,[45] which is an online community of practice for educators across Ontario supporting teacher professional development. Here, teachers may come together to share information, and also to get resources from the TLLP and from the ministry.

Besides the key responsibilities and requirements of the teacher performance appraisal (Ontario Ministry of Education, 2010), there is no legal requirement for teachers to engage in additional qualification courses or other kinds of in-service training. Nevertheless, teachers in Ontario do take additional qualification courses or pursue graduate studies on their own time, in order to improve their teaching. Some teachers take additional qualification courses in order to improve their opportunities to assume leadership in school districts or to become principals, but very often teachers in Ontario take additional qualification courses for their own learning purposes and because they are interested in developing their understanding of their teaching practice. A pragmatic reason for teachers to do so could be that additional qualification may help a teacher move up the salary grid. Most teachers graduate at the second highest level of the salary grid, so it takes some effort to get to the next level. However, because of declining enrolment in Ontario's school boards, new teachers in particular tend to pursue additional qualification courses and graduate studies, in order to develop the expertise that will allow them to apply for more kinds of jobs, such as supervisory officer or principal, and thus maximise their opportunities for employment. In other words, additional qualifications help teachers both financially and professionally.

Experiences: Successes, challenges, and lessons learned

In closing, the interviewees were asked to elaborate on the Ontario Ministry of Education's experiences of knowledge mobilisation in primary and lower secondary education, for instance what promotes or hinders the use of research, and the teachers' general attitudes towards using research-based knowledge in their practice.

According to the interviewees, teachers in Ontario are very interested in, and open to using research when they find that the research is connected to their "real world" of classroom practice. New teachers in particular, have an evident orientation towards a research-focused attitude, collaboration, and a questioning habit of mind. In general, the teachers approach their work as

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[44] http://www.edu.gov.on.ca/eng/teacher/tllp.html
[45] http://mentoringmoments.ning.com

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learning and believe that teaching is complex and that their professionalism must be founded on a solid foundation of groundwork. However, as with teachers around the world, time demands are a general concern for the teachers and are definitely a challenge in their daily work.

The fact that many district school boards have adopted a collaborative inquiry approach and are using the structures of collaborative learning seems to influence teachers positively. This means that teachers follow an inquiry process that they have learned through the Early Primary Collaborative Inquiry, or through other ministry initiatives. Thus formal collaborative inquiry has had an enormous influence as a powerful mechanism for professional learning that changes practice, but also through the establishment of pedagogical documentation as a powerful tool for teachers to use.

The ministry has found that the processes of collaborative inquiry influence how district school boards work, in terms of what teachers are learning comes from a bottom-up approach and to a lesser extent, from a top-down approach. That fact that the collaborative inquiry approach provides opportunities for teachers to develop their own questions concerning problems of practice and to observe, think and work together are strong conditions that support the use of research and knowledge mobilization. Despite the fact that teachers in Ontario schools have a great deal of autonomy, projects and structures built around collaborative learning have helped teachers to start to feel that they are part of their school, part of their district school board and part of their province. This kind of sharing among teachers and other school practitioners, and the idea of educator ownership has caused teachers to want to keep learning more. The interviewees also point out that when professional learning comes from the teachers' own "real word," from the students in their classrooms, knowledge mobilisation seems to be much stronger.

The ministry also sees that smaller projects, with teacher teams working in job-embedded contexts such as the TLLP and the PKE programme, can grow to influence practice in a broader way, if there is significant uptake and if the evidence is there.

According to the interviewees, school and system leaders such as principals and supervisory officers also play a critical role in creating the conditions for learning and modelling the use of research in teachers' daily teaching practice. It is vitally important that leaders help teachers to ask the questions, "how do we know?" and "how can we find out?" in order to support learning conditions for teachers. For this reason the ministry has developed the Ontario leadership framework, which is part of the Ontario leadership strategy (Ontario Ministry of Education, n.d.-j).

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Scotland

Policy framework

Scotland is part of the United Kingdom and covers the northern third of the island of Great Britain. The country is a devolved parliamentary legislature within a constitutional monarchy. The wider UK parliament at Westminster retains responsibility for a number of matters. The estimated population of Scotland is around 5.3 million (National Records of Scotland, 2015).

Structure of primary and lower secondary education

Scotland has a long-standing tradition of offering universal public education. Education policy is completely devolved to Scotland. In accordance with the Education (Scotland) Act of 1980, the provision of education is the responsibility of local authorities, who discharge the function of education authority. This includes all aspects of education from the school buildings to the delivery of the curriculum. There are 32 local authorities.

Education is delivered as primary education (5–11 years of age) and compulsory secondary education (12–16 years of age). In Scotland, children usually start primary school at the age of five and complete seven years of primary school, after which they usually complete five or six years of secondary school. It is mandatory for all children and young people between the ages of five and sixteen to attend school five days a week during the school year.

The Scottish curriculum (the Curriculum for Excellence) delivers a broad, general education. Teaching takes place within a range of curriculum areas, including mathematics and numeracy, languages and literacy, health and wellbeing, sciences, and social studies. The curriculum aims to transform education in Scotland by providing a coherent, more flexible and enriched curriculum for students aged three to eighteen. The curriculum includes the totality of experiences that are planned for children and young people through their education, wherever they are being educated (Education Scotland, n.d.-b). Three partner organisations stand behind the implementation of the curriculum: Education Scotland, the Scottish Qualifications Authority, and the Scottish government. The curriculum is perceived as a flexible construct provided as a framework within which teachers work. A great deal of power is in local hands, with local authorities and teachers determining the content that is taught, and the teachers also have the power to decide which pedagogy to use and how they are going to teach it. Within the broad, general education, children and young people are entitled to experience learning and teaching in all eight curricular areas. Three areas of the curriculum were considered so significant that **all** teachers are responsible for them: health and wellbeing, literacy across learning, and numeracy across learning. Within this

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general framework, schools are free to determine education content and structure.

In August 2015, it was announced that national standardised assessments focusing on literacy and numeracy were to be implemented for primary school students in years one, four, and seven, and for secondary schools students in their third year, starting in 2017. In January 2016, it was announced that data on the achievement of Curriculum for Excellence levels for literacy and numeracy at the above-noted stages would be collected nationally. This data will be based on teacher judgement, informed by standardised assessment (British Council, n.d.-a, British Council, n.d.-b).

Political strategies and initiatives

The Scottish educational system can be viewed from a national level, a local level, and from a teacher-level perspective. On all three levels, research evidence plays an increasingly important part in the system. At the international level, Scotland takes part in PISA and at the national level a sample survey of literacy and numeracy attainments, entitled the Scottish Survey of Literacy and Numeracy (SSLN), has been developed. Previous Scottish government support for education research, such as the AERS scheme geared towards developing self-sustaining collaborative networks, has had some success. However, there are currently no long-term research partnerships in place or a set model of academic engagement with policymaking. In the current economic climate, engagement with research providers (not just within academia) is undertaken from time to time on specific issues, and follows Scottish government procurement guidelines.

With regard to translating educational research into practice at schools, there is a lot of interest from a political point of view. However, at this point of time, in Scotland there is no national strategy or policy aimed specifically at this matter. This is under development. For instance, discussions are currently taking place between Education Scotland and other key partners, concerning the role of research in improving practice, as part of the new National Improvement Hub.[46] Quite a few initiatives are aimed directly or indirectly at the facilitation of teacher improvement and development, including their work with research and practice.

In Scotland, the government, the ministry and the universities collaborate effectively, and the universities are almost the only source of research. However, a couple of think tanks and What Works centres are found, as are a few private consultancies and charities, such as The Educational Institute, and Scottish Educational Research Association. Many of the units are United Kingdom-wide and have a broader perspective, such as social work-oriented.

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[46] https://education.gov.scot/improvement

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In the following sections a range of political initiatives and key players working with knowledge mobilisation in Scotland are described.

Education Scotland

Education Scotland, an agency of the Scottish government, is the Scottish national body for supporting quality and improvement in learning and teaching. The agency was formed in 2011. It brought together a number of organisations and teams whose work contributes to key areas of the agency's remit. One of the initiatives being funded is a national survey called the Scottish Survey of Literacy and Numeracy (SSLN), which is a study that works with schools, investigating the literacy and numeracy learning of a nationally representative sample of young people (Scottish Government, n.d.-a). The research results published are specifically aimed at practising teachers.

Education Scotland also produces research briefings[47] for practitioners, to support their engagement with the research bases in particular areas. At the moment these are focused on the Scottish Attainment Challenge, which aims to close the equity gap by raising the attainment of children and young people living in deprived areas of Scotland (Education Scotland, n.d.-a). In the following sections, some of the arrangements initiated or supported by Education Scotland will be described.

The School Improvement Partnership Programme (SIPP)

The action-research programme based on collaborative inquiry – the School Improvement Partnership Programme (SIPP)[48] – is an initiative of Education Scotland. The purpose of the programme is to achieve improvement by enabling school practitioners to speak with each other, to research, to experiment with their practice and look at the changes taking place in their schools. SIPP focuses on educational inequality and draws on international research and practice to demonstrate how local partnerships and collaborations are important for effective school improvements. It is the intention to support partnerships that can lead to substantial and sustained development and raised attainment for practice.

The Scottish Learning Festival

The Scottish Learning Festival[49] is an annual conference and exhibition arranged by Education Scotland, and since it was launched in 2000, it has become a central event for those working in the educational system. The aim of the festival is to bring together the teaching profession in order to provide inspiration, networking, and development, so that school practitioners

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[47] http://www.educationscotland.gov.uk/learningandteaching/thecurriculum/whatiscurriculumforexcellence/keydocs/cfebriefings.asp
[48] http://www.educationscotland.gov.uk/learningandteaching/partnerships/schoolimprovementpartnershipprogramme/intro.asp
[49] http://www.educationscotland.gov.uk/slf

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are well equipped to handle the challenges they meet in their daily practice. From its first year until the present, the Scottish Learning Festival has welcomed over 49,500 delegates, and yearly the festival welcomes between 4,000 and 6,500 visitors. Although the focus is on Scottish practitioners, the festival attracts participants from all over Europe. It is aimed at school principals, teachers, school management, policymakers and others working with or within early years, primary, secondary, further and special education establishments, and in lifelong learning. It has clearly become a success story beyond the Scottish borders, and invites well-known researchers and guest speakers from Scotland and abroad.

Glow Scotland
Glow Scotland[50] is a nationally available digital environment for learning that is aimed at learners and educators across Scotland. Glow Scotland is funded by the Scottish government, and the objective is to facilitate collaboration and learning between teachers and learners. User accounts are available to all schools and education institutions across Scotland, which gives learners and educators access to a number of central and relevant resources for education. The website is an online platform for collaboration, innovation and learning, and easy web publishing.

Growing Up in Scotland
Growing Up in Scotland (GUS)[51] is a longitudinal research study funded by the Scottish government and carried out by ScotCen Social Research in collaboration with the Centre for Research on Families and Relationships at the University of Edinburgh and the Medical Research Council Social and Public Health Sciences Unit at Glasgow University. The study tracks thousands of children and their families from birth to their teens and beyond. The project provides new information to help the Scottish government and others develop policies and services for children and their families within a school context. The data GUS collects is made publicly available; hence the large amount of collected data may be used by researchers and policymakers, among others.

General Teaching Council for Scotland
The General Teaching Council for Scotland (GTCS)[52] is an important player in the Scottish educational system. GTCS is an independent, self-regulating teaching council, funded by the teachers' member fees. Any teacher teaching in a Scottish state school is legally required to register with the GTCS. Being registered not only allows an individual to teach, but it also assures employers, parents and children that teachers meet a national professional teaching standard (General Teaching Council for Scotland, 2015).

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[50] http://connect.glowscotland.org.uk
[51] http://growingupinscotland.org.uk
[52] http://www.gtcs.org.uk

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The General Teaching Council is governed by a council composed of nineteen elected teachers, eleven nominees from stakeholder groups and seven appointed lay members. The council sets GTCS policy and standards for teaching. The council has a substantial role to play in determining and shaping the teaching profession in Scotland, and maintaining and improving professional standards. Moreover, the council plays a pivotal role in raising educational standards. In Scotland, newly qualified teachers have the opportunity to take part in a national induction programme called the teacher induction scheme, as "probationer teachers." The council sets and maintains codes of conduct, and guides and supports teachers through this induction, through their probation, and into the classroom. The council has also set out and reviews clear professional standards to clarify what is expected at each stage of a teacher's career (General Teaching Council for Scotland, n.d.-a). The standard for provisional registration and the standard for full registration are part of the GTCS's professional standards, which also include the standard for career-long professional learning and the standards for leadership and management. The standard for full registration aims to give teachers a clear and precise description of the professional qualities and abilities they are expected to maintain and enhance.

The standards for teaching are expected to be implemented in the classroom by every teacher and are seen as a central part of the professional aspect of being a teacher. The standards are meant to be used to help teachers to exercise critical thinking and to reflect on their practice. Moreover, the standards should be used as a tool to plan the teachers' professional learning through reflection and self-evaluation, and discussions with colleagues. Each of the standards covers professional values and personal commitment, professional knowledge and understanding and professional skills and abilities (General Teaching Council for Scotland, n.d.-b.). Teachers have a role in terms of using research in relation to the standards.

The GTCS focuses on teachers' engagement in the professional update, which became a requirement for all registered teachers from August 2014 (General Teaching Council for Scotland, n.d.-f). The professional update is meant to maintain and improve the quality of teachers, as outlined in the professional standards, and hence the impact they have on their students, and to support and enhance the teachers' and the teaching professions' professional development. The professional update involves teachers' using evidence of impact and their professional learning, which emphases reflection on practice, collaborative and experiential learning, and cognitive development. Using evidence of impact refers to teachers incorporating self-reflection on their practice, as this will encourage teachers to analyse what is going on in their classrooms (General Teaching Council for Scotland, n.d.-c).

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EducationHUB Project

In January 2015 the General Teaching Council for Scotland launched a new initiative that supported and promoted practitioner research, called the EducationHUB Project. EducationHUB is an interactive platform that provides teachers with the chance to share, discuss, and review unpublished research and teachers are also able to ask their peers for recommended knowledge resources and best practices. The online platform is available to all GTCS registrants, who may log on via their MyGTCS account. The purpose of the platform is to create an opportunity for teachers to access, discuss, and review one another's research, to be inclusive, and to make teachers' research accessible to colleagues across Scotland. Any teacher who has engaged in research or practitioner inquiry, and who would like to publish their work and present it for peer review, may contribute to the platform. Likewise, any member of EducationHUB can also review articles (General Teaching Council for Scotland, n.d.-d).

Teacher education programme

Scottish teacher education (ITE, initial teacher education) is provided by eight universities across Scotland. In order to become a primary or secondary school teacher one may choose between two programmes, either a four-year undergraduate programme or a one-year Professional Graduate Diploma in Education programme (PGDE). The PGDE is a 36-week course for graduates who want to train as primary school teachers. As mentioned, newly qualified teachers in Scotland have the opportunity to take part in a national induction programme called the teacher induction scheme as "probationer teachers." The programme offers a one-year teaching post in a Scottish local school, and all participants have access to the services of an experienced teacher as a mentor, and time set aside for professional development. On finishing the programme, teachers are entitled to full registration with the General Teaching Council for Scotland (Scottish Government, n.d.-b, Teach in Scotland, n.d.-a).

As the teacher induction scheme is not compulsory, it is also possible to complete probationary service through the flexible route. The flexible route is for teachers who, for various reasons, are not interested in or eligible to join the teacher induction scheme. It encompasses some mandatory elements that all probationers must complete, but acknowledges that not everyone is able to complete probation in a structured way because of employment opportunities in their area, differences in teaching experience and availability of support networks. Probation may also be completed at most independent (fee paying) schools, where experiences similar to the teacher induction scheme are often provided (General Teaching Council for Scotland, n.d.-e, Teach in Scotland, n.d.-b, Teach in Scotland, n.d.-c, Teach in Scotland, n.d.-d).

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Further teacher training: skill development and seeking new knowledge

As mentioned earlier, all registered teachers in Scotland are required to engage in the professional update. The key purposes of the professional update for teachers are to maintain and improve the quality of teachers as outlined in the relevant professional standards and to enhance the impact that they have on their students' learning. The purpose is also to support, maintain and enhance teachers' continued professionalism and the reputation of the teaching profession in Scotland (General Teaching Council for Scotland, n.d.-f).

Scottish teachers are obligated to undertake professional development each year, a minimum of 35 hours per year, known as career-long professional learning (CLPL). They have an obligation to do so in their contract, in order to maintain their licence. The Scottish universities offer a variety of courses that teachers may pursue. However, many of these courses come with a high price attached, and frequently teachers are unwilling or unable to pay the costs of those courses. This means that the number of teachers taking these courses is not that high. Other opportunities for professional development are available, such as those initiated by local authorities, the teachers' employers where they support teacher learning through peer education programmes, collaborative observation and discussions, and so on. Some local authorities and employers also offer "twilight courses," which take place after work hours, from 16.00 to 18.00. There is no evidence of the outcomes of these kinds of courses, nevertheless, they are cheap and the teachers attend them. Furthermore, Education Scotland and other organisations also provide free professional learning opportunities for teachers.

In Scotland, professional development may take many forms, such as professional reading, attending conferences, teamwork with colleagues, study visits, and so on. A trend may be seen among teachers, as many of them actually spend more than the compulsory 35 hours per year on professional development. In fact, many of them attend a lot more professional learning activity at weekends and during vacation periods, partly because it is difficult to get permission to be away from the classrooms during the day, as it requires substitute teachers.

From a governmental point of view there is a strong incentive to increase the number of teachers pursuing further training and professional development. Therefore, the Scottish government has provided extra funding to support master's level studies of existing teachers. The Scottish Framework for a Master's in Education is based in the hope that teachers in Scotland will participate in masters-level learning throughout their careers, thus supporting critically-informed practice (General Teaching Council for Scotland, n.d.-g). This underlines the focus on strengthening the link between research and practice, by encouraging teachers to also apply research. Today there are no legal requirements for Scottish teachers to apply

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research to their teaching practice. However, they are encouraged to use research-based knowledge through the ongoing professional standards, and these expectations are very much part of the professional identity of Scottish teachers. Teachers are expected to learn from relevant projects and professional learning events, such as the ones mentioned above. Moreover, the General Teaching Council for Scotland produces research literature and makes it available to teachers, which is a way for teachers to gain new research-based knowledge in areas relevant to their practice, for free. Searching for and applying research is not yet a completely implemented part of the teachers' work procedure, as many teachers still look for something more practical and immediate for their classroom practice than a piece of research.

Experiences: Successes, challenges and lessons learned

In closing, the interviewees were asked to elaborate on their experiences of knowledge mobilisation in primary and lower secondary education, for instance, what promotes or hinders the use of research, and the teachers' general attitudes towards using research-based knowledge in their practice.

According to the interviewees, there is significant focus on getting knowledge into action in the Scottish educational system. In terms of translating research into teaching practice, what has been shown to be successful is when researchers make an effort to make research accessible to an audience of teachers, in other words, when they have explained their research findings and its implications for teaching practice. This establishes a stronger link between what may sometimes be fairly abstract research and teaching practice in classrooms. Oral presentations of research are seen as more persuasive, as the audience has the opportunity to immediately clarify any misunderstandings, and to get clarifications directly from the researchers or mediators.

Establishing a teacher culture where teachers see the use of research as part of their professional identities is also a focus. Teachers need to acquire the habit of seeking research-based knowledge and literature in order to enhance their practice, both in general and in relation to specific challenges. For instance, poor national literacy results encouraged school principals and teachers to search for examples of best practice from research and literature.

Making use of research in teaching practice takes work, and has to be done one step at a time. As in many other countries, the interviewees regard time as an important factor, as many teachers feel challenged to find the time to dig into complicated research, and research is perceived as daunting. Moreover, many teachers tend to have the attitude, "if it works, why change it?" even if it might be for the better. In view of the interviewees' statements, one very important and significant step would be to make research available through easily

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accessible media and in accessible language. This includes making research available online, for instance through the Scottish Attainment Challenge programme, which contains the previously-mentioned National Improvement Hub (web portal) developed in 2016.

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Sweden

Policy framework

Sweden is a Nordic country situated on the Scandinavian peninsula. Measured by geographical size, Sweden is one of the largest countries in Europe, and its population of approximately 9.8 million makes it the largest of the Nordic countries (Statistics Sweden, 2016). Education in Sweden is under the control of a strong state authority within a framework of relatively small ministerial departments and large state bodies, with the Swedish National Agency for Education (Skolverket) as the primary authority. In Sweden, school development, including the dissemination of educational research, is a matter receiving a lot of political attention and financial support.

Structure of primary and lower secondary education

In Sweden, the main responsibility for running schools lies with the municipalities and the organisers of independent schools. School attendance is compulsory at primary school level (years 1 through 9), starting from the year the child turns seven, and ending with the ninth grade (Skolverket, 2016a). All children have the right to attend a year-long, free preschool class (förskoleklass) that starts the year in which the child turns six (Skolverket, 2016b). Like preschool class, primary school attendance in Sweden is free of charge.

Educational content is directed by a general curriculum (Skolverket, 2011) that states which subjects students are to become familiar with. In this sense, schools are goal-driven, but there is widespread local accountability. Hence, it is for parliament and government determine the overall framework, whereas the local authorities maintain the daily function of schools in collaboration with principals. School management must incorporate school laws and regulations as well as the general curriculum.

Compulsory schools may be either municipal or independent. The majority of compulsory schools in Sweden are municipally run, and pupils most commonly attend a municipal school close to their home.

In 2011 the curriculum for the compulsory school, preschool class and the recreation centres (Skolverket, 2011), Lgr11 for short, came into effect. This is a regulatory paper issued by the government, stating the values, goals, and guidelines that Swedish schools must follow in their work. The overall curriculum contains three parts:

- Fundamental values and tasks of the school
- Overall goals and guidelines for education
- Syllabuses, supplemented by knowledge requirements.

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The syllabuses contain the aim, goals, and core content of each school subject, with the core content stating what must be covered in the course of teaching. The core content is meant as a tool to provide scope for teachers to go into greater depth or add additional content.

National tests are set for certain subjects in year three (mathematics and Swedish/Swedish as a second language), year six (English, mathematics and Swedish/Swedish as a second language) and year nine (same subjects as in year six plus geography, history, religion, or social sciences, and biology, physics or chemistry). National tests are not seen as exams, but are meant to be part of teachers' overall assessments of student skills. It is up to the government to decide which subjects and classes to include in national testing, with universities/ university colleges designing tests and running trials to ensure quality on demand from Skolverket (Skolverket, 2016c).

Political strategies and initiatives

In Sweden, a number of laws and governing bodies regulate and give structure to the educational system. In the following sections, central laws and regulations as well as state agencies will be presented, to build an image of the overall functioning of the Swedish educational system.

The Education Act of 2011

In 2011, a new Education Act (Utbildningsdepartementet, 2010) was implemented. The Education Act clearly states that primary education in Sweden must be knowledge-based, as the fifth paragraph of the first chapter states that "Educational programmes must be based on scientific knowledge and proven experience." Thus the overall teaching principles and their elaboration into practice must include research-based knowledge in their cores. The Education Act determines the rights and obligations of local school authorities, students and their caregivers, and may be seen as the backbone of educational policy in Sweden. Responsibility for passing the Education Act lies with the Swedish parliament.

In addition to the Education Act, a number of other laws play a part in shaping educational policy in Sweden. These are referred to in the Education Act, and include international conventions that have been built into the Swedish legal system. The following national and international laws are worth mentioning when looking at educational policy in a Swedish context: The Working Environment Act, The Discrimination Act, The Public Administrations Act, The Public Access to Information and Secrecy Act, The UN's Convention on the Rights of the Child and The Human Rights Convention.

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Besides the above-mentioned laws, a number of regulations and recommendations exist, for example, those regulating the different types of schools in Sweden. In legal terms, regulations are determined by the government and are binding. The Swedish National Agency for Education (Skolverket) also has the authority to issue legally binding provisions if encouraged to do so by the government. Skolverket collects information on all existing laws and regulations in its Code of Statutes, entitled SKOLFS (Skolverket, 2016). Recommendations for how schools are to incorporate and adjust to regulations are not binding, so long as the individual school ensures compliance with legal standards.

The Swedish National Agency for Education (Skolverket)

In Sweden the National Agency for Education (Skolverket)[53] is the administrative authority for schools, preschools, and other types of educational activity. It issues regulations and recommendations, and has the overall responsibility for national testing and for official statistics and evaluation in the area of education. Also, Skolverket is obligated to contribute to enhancing educational quality through national initiatives with the aim of developing schools and offering further training to staff members such as teachers, principals, and local authorities. Finally, Skolverket is responsible for disseminating research findings and making them usable within the field of practice.

In legal terms, Skolverket is governed by two main regulative documents: the instruction (instruktionen) (Utbildningsdepartementet, 2015) which is fixed and determines the overall functioning of Skolverket, and the regulatory letter (regleringsbrevet) (Utbildningsdepartementet, 2014), which is issued by the Swedish parliament once a year and states the main tasks and activities that must be carried out by Skolverket that year. The responsibility for collecting and disseminating research-based knowledge is written into the instruction, making it a constant, binding obligation. Ninety-seven per cent of the work undertaken by Skolverket is at the request of the ministry for education and research.

Skolverket monitors research in certain fields, in collaboration with research institutions such as universities and teacher education centres. Dissemination of research findings takes place online and through a pocket series entitled "Forskning för Skolan" which is freely downloadable from Skolverket's website,[54] and teachers and other school practitioners in Sweden may also order hard copies of the pocket series. In this series, knowledge narratives and overviews of literature with different themes are made available, with a focus on what is needed in the field of practice. On their website, Skolverket aims to offer an overall picture of recent research activity within certain fields, providing links to research and knowledge

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[53] http://www.skolverket.se
[54] http://www.skolverket.se/skolutveckling/forskning

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summaries on other websites. The purpose of these dissemination activities is to increase the knowledge and use of research and proven experience within the field of practice.

The last task worth mentioning here is Skolverket's role as a supervisory body in the teacher legitimation process. It is up to Skolverket to decide upon and issue teachers with the teaching certificate required for the specific grade levels in order to find permanent employment in Swedish schools.

The Swedish Schools Inspectorate (Skolinspektionen)

The Swedish Schools Inspectorate (Skolinspektionen),[55] established in 2008, is a state authority responsible for supervising schools and processing applications from foundations and others wishing to run independent schools. It is also the responsibility of Skolinspektionen to carry out inspections of all educational facilities, including schools, preschools, and adult education centres. The Child and School Student Representative (Barn och Elevombudet BEO), acting both as a sub-unit of Skolinspektionen and independently, works to ensure the rights of children in schools and preschools. The BEO safeguards the rights of children and students, meaning that it investigates complaints of degrading treatment and has the authority to represent children and students in a court of law (Barn och Elevombudet, 2015). The Board of Appeal for Education (Skolväsendets överklagandenämnd, ÖKN), is an independent authority similar to a court, designed to protect students from wrongful decisions made by the educational system. Here students or their responsible guardians can appeal decisions made in connection with school activity (Skolväsendets överklagandenämnd, n.d.).

The Swedish Institute for Educational Research (Skolforskningsinstitutet)

The Swedish Institute for Educational Research (Skolforskningsinstitutet)[56] is a newly formed government agency established to contribute to the use of research findings by practitioners in the Swedish educational field, primarily focused on the planning, performance, and evaluation of learning and teaching clearly in relation to children's and pupils' development and academic attainment.

The task of Skolforskningsinstitutet is to identify areas within the school system where relevant applied research is lacking. The institute dedicates funds for applied research of the highest scientific calibre to those areas where such relevant research is lacking. In other words, the basic perspective and starting-point for the institute's activities is needs of and relevance to practitioners (Skolforskningsinstitutet, 2016).

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[55] https://www.skolinspektionen.se
[56] http://skolfi.se

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The institute's main task is twofold; the first is to produce systematic research reviews and make these available to teachers, principals, and other actors within the school system. In the future, the institute will also assess the quality of previously internationally-published systematic reviews, and their relevance to the Swedish context. The institute's second task is to identify professionally relevant fields of research where more knowledge is needed (so-called "fields of uncertainties") and to allocate funding for high-quality research in these fields. All research projects financed by the institute are to be based in school settings. Currently the institute receives annual funding of around SEK 20 million for running expenses and around SEK 20 million for research funding. It comprises two decision-making bodies: the board (Skolforskningsnämnden) and the scientific council (det Vetenskapliga Rådet). The board, whose members are appointed by the government, determines which systematic reviews the institute should carry out, and the yearly calls for research funding. The scientific council, also appointed by the government, has two tasks: to aid the institute in relation to its work with systematic reviews and to make decisions on research grant applications (Skolforskningsinstitutet, 2016a; Skolforskningsinstitutet, 2016b).

The Swedish Research Council (Vetenskapsrådet)

The Swedish Research Council (Vetenskapsrådet)[57] is an authority within the Ministry of Education and Research, and the main source of governmental research funding in Sweden. Its primary task is to fund basic research of the highest scientific quality in all scientific fields. Its priority in awarding research funding is, and must be, academic excellence. Within this framework the Committee for Educational Sciences (Utbildningsvetenskapliga kommitté, UVK) determines the allocation of funds for research and postgraduate education in the field of school and preschool development, that is, research about learning, teaching, training and education, and contributions to scientific knowledge development in the educational sciences. Educational research focused on professional training and higher education is also covered by the mandate. Scientific excellence is the main quality criterion in the assessment of applications.

The Institute for Evaluation of Labour Market and Education Policy (Institutet för Arbejdsmarknad och utbildning, IFAU)

The Institute for Evaluation of Labour Market and Education Policy (IFAU)[58] is a research institute within the ministry of employment, receiving large sums of money from the government for its evaluations of educational policy. IFAU's goal is to support and carry out scientific policy evaluations in the areas of labour market policy, educational policy, and social insurance policy. In addition to doing research, IFAU disseminates knowledge online

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[57] http://www.vr.se
[58] http://www.ifau.se

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and through publications and seminars, as well as by making data available to researchers both in Sweden and abroad.

The National Agency for Special Needs Education and Schools (Specialpedagogiska skolmyndigheten, SPSM)

The National Agency for Special Needs Education and Schools (SPSM)[59] works to ensure adequate conditions for all children to reach educational goals, regardless of their functional ability. The agency specialises in the educational consequences of disabilities, and offers special-needs support to schools and teachers, as well as teaching materials and government funding. The SPSM also attempts to bring research and practice closer together by disseminating research findings on special-needs education, and by building networks with universities and other institutions.

The Sami School Board (Sameskolstyrelsen)

The Sami School Board (Sameskolstyrelsen)[60] has authority over Sweden's Sami schools. In these schools, children in years 1 through 6 are taught through a special curriculum designed to accommodate Sami needs and develop their special languages and culture. When they have completed year 6, Sami children continue their education at a regular primary school.

Economy and funding

In Sweden the dissemination of research-based knowledge to the field of practice is funded in part by so-called "school development funds" (skolutvecklingsmedel). Skolverket receives a portion of these funds and decides relatively freely on their use. As mentioned, Skolverket sometimes commissions universities to conduct research monitoring and overviews. Some of the school development funds are earmarked for subjects of special interest, such as motivation for reading and mathematics skills. For instance, Skolforskningsinstitutet receives governmental funding, and is bound to allocate the majority of its resources to research funding.

As mentioned, the Committee for Educational Sciences (Utbildningsvetenskapliga kommitté, UVK) is the sub-unit of the Swedish Research Council (Vetenskapsrådet) in charge of supporting high-quality research relevant to teacher training and educational activities. According to the interviewee, the Committee granted funding for 26 research projects in 2014, amounting to a total of SEK 154 million. The majority of research projects receiving funding incorporate a focus on preschool and primary school. Around a fifth of total funds are granted to projects focusing on the use of digital technology in education. Several projects on ethics and values have also been funded. A large part of educational research receiving

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[59] https://www.spsm.se
[60] http://www.sameskolstyrelsen.se

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funding over the next couple of years will probably take the form of basic research on practice and the teaching profession.

Teacher education programme

Teacher education in Sweden varies in terms of duration according to the age group and subjects a student wishes to teach. Thus it takes between 3.5 and 5.5 years to become a teacher, and leads to either a bachelor's or a master's degree. Teacher education is structured so that all students take a common course in pedagogy, didactics and special-needs education. The remaining subjects are electives, and give students the opportunity to specialise in particular subjects (in order to teach in lower secondary education) or to choose a broader range of subject areas, allowing them to teach in primary education. Qualifying as a primary school teacher takes around 3.5 years for the lower grades and 4.5 years for the upper grades (EVA & DPU, 2009).

Since the 1970s, Swedish teacher education has been an integral part of higher education, meaning that teacher education in Sweden is research-based and takes place at universities or university colleges (högskolor), both working under higher education legislation. For a long time, teacher education institutions have attempted to strengthen the use of scientific knowledge, for example, by incorporating theory of science and qualitative and quantitative research methods, and requiring students to write a final thesis consistent with basic methodology standards. Thus the ability to find and make use of scientific knowledge is required of students at Swedish teacher education institutions. Successive changes in legislation have also made it easier for teachers to gain access to research training positions. Systematic controls of the quality of teacher education programmes are carried out by the Swedish higher education authority (Universitetskanslersämbetet, UKÄ) (ibid.).

In Sweden, newly qualified teachers have the right to an introduction period equivalent to one school year. During this time, the teacher is provided with a mentor who can offer professional support. The responsibility for planning the introduction period and finding a well-suited mentor lies with the school principal (Skolverket, 2015).

Teacher certification came into effect with the Education Act of 2011, its purpose being to improve school quality, increase teachers' professional status, and clarify in which types of school, which subjects and which years the individual teacher is qualified to teach. In Sweden, certification is required in order for a teacher to be allowed to assign grades and find permanent employment. In order to be certified, teachers must pass a documented teacher's exam. Certification is given in the subjects taken during the programme of study.

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The administration of teacher certification lies with Skolverket (Skolverket, 2016d).

Further teacher training: skills development and seeking new knowledge

In Sweden, in-service teacher training is not subject to any specific demands or rules. The extent to which teachers participate in professional development activities is regulated by agreements between local authorities and teachers' unions, and training content is determined locally. Professional development activities are offered by universities, university colleges, and private education corporations.

Skolverket also offers state funding to municipalities and the organisers of independent schools for certain professional development efforts including the Teacher Lift (Lärarlyftet). The purpose of this initiative is to allow teachers to be certified for subjects they are already teaching, but are not formally trained for, increasing the number of fully educated and certified teachers in Sweden. The Teacher Lift, which runs until the end of 2018, is a highly prioritised initiative, which is to be seen as part of the process of implementing the teacher certification system. Since teachers are required to meet certification requirements for all subjects and grade levels they teach, there is a need for a system that improves the competence of those teachers who do not meet the demands of all their subjects. Teachers participating in the programme are offered university courses in the necessary subjects. Teachers working in schools for students with special needs are required to take certification courses in order to earn a postgraduate degree in special-needs education (Skolverket, 2016e).

Teachers in Sweden with a certain amount of experience and extraordinary teaching skills have the opportunity to apply for the positions of First Teacher (förstelärare) or Associate Professor (lektor). Both positions have been established as a means of making teaching a more attractive career path and ensuring a high-quality education for students.

The position of First Teacher is given to teachers who have shown an extraordinary ability to increase student achievement and a special interest in education development. In addition to receiving a pay rise of at least SEK 5,000 a month, First Teachers may apply for a reduction in teaching hours, enabling them to focus on development question, acting as ambassadors for the use of research within the field of practice. An Associate Professor is a certified teacher who has at least four years of proven teaching experience of high educational quality and who has taken an additional examination as a researcher (licentiate or PhD). This position carries a pay rise of at least SEK 10,000 a month. In the case of both positions, the school authorities are in charge of recruitment and payment, with the state offering a financial contribution (Skolverket, 2014).

Experiences: successes, challenges, and lessons learned

In closing, the interviewees were asked to elaborate on the challenges and successes related to knowledge mobilisation experienced by the Swedish educational system, for instance, what promotes or hinders the use of research, and teachers' general attitudes towards using research-based knowledge in their practice.

According to the interviewees, one of the main challenges when trying to increase the use of research-based knowledge in Swedish schools is the lack of time for teachers to explore new knowledge. In their view, several steps could be taken to address this problem, the first being to support first teachers to take the initiative and seek a mandate with which to promote the use of research, the second being an increased focus on management chains and organisational questions. According to the interviewees, it is necessary for local authorities to be pushed to work with research-based education by their superiors, so that the focus on research is prioritised all the way through the chain of command. It has to be built into the system in order to make the development and discussion of research-based practices both possible and obligatory for local authorities, first teachers and teachers.

According to the interviewees, teachers are happy to use research so long as the following conditions are met:

- Their interest is founded in a question or a problem that they themselves have formulated
- Research exists to answer their question. (As questions are often practice-bound, this may not always be the case)
- Research is available to them, and they are equipped with the skills to make use of it
- Management ensures that the appropriate framework is in place, meaning that teachers are given time to participate in research and can receive support when trying to incorporate research findings in their teaching

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Appendix 8 Searches, inclusion and exclusion criteria

Searches
The following databases were searched:

CBA Education is a Canadian educational research database.

PsycINFO is a database published by the American Psychological Association, which comprehensively indexes international psychology literature.

ERIC (Educational Research Information Center) is a database for education sponsored by the US Department of Education.

AEI (Australian Education Index) is an Australian database for educational research.

BEI (British Education Index) is a British database for educational research.

Web of Science is an international database providing access to references from different research areas, including educational research.

Forskningsdatabasen is a Danish research database.

SwePub is a Swedish database providing access to research published at Swedish Institutions.

Broad and narrow searches of all the databases were conducted. The searches were conducted using the following search profiles:

CBCA

CBCA broad search, 8 February 2016

(("Evidence-based practice*" OR "Knowledge dissemination*" OR "Knowledge transfer*" OR "Knowledge mobilization" OR "Knowledge mobilisation" OR "use of research evidence" OR "Knowledge Exchange" OR "Information Utilization" OR "information utilisation" OR "Information Dissemination" OR "Information Transfer" OR "Knowledge Communication" OR "Research engaged" OR "research informed" OR "research in practice" OR "evidence-based teaching" OR "evidence-informed teaching" OR "research-based teaching" OR "research-in-

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formed teaching" OR "knowledge acquisition" OR "research use" OR "knowledge use" OR "research utilization" OR "research utilisation" OR "scale up" OR "replication" OR "proven programs" OR "diffusion") AND yr(2005-2016))

CBCA narrow, 1 March 2016:

(Effective program implementation) AND (school OR grade) AND yr(2005-2016))

CBCA narrow 2, 1 March 2016:

((elementary school teachers) AND (program* implementation) AND yr(2005-2016))

PsycINFO

PsycINFO broad search, 8 February 2016

 ("Evidence-based practice*" OR "Knowledge dissemination*" OR "Knowledge transfer*" OR "Knowledge mobilization" OR "Knowledge mobilisation" OR "use of research evidence" OR "Knowledge Exchange" OR "Information Utilization" OR "information utilisation" OR "Information Dissemination" OR "Information Transfer" OR "Knowledge Communication" OR "Research engaged" OR "research informed" OR "research in practice" OR "evidence-based teaching" OR "evidence-informed teaching" OR "research-based teaching" OR "research-informed teaching" OR "knowledge acquisition" OR "research use" OR "knowledge use" OR "research utilization" OR "research utilisation" OR "scale up" OR "replication" OR "proven programs" OR "diffusion") AND (su.exact("Adolescence (13-17 yrs)" OR "School Age (6-12 yrs)") AND la.exact("ENG" OR "NOR" OR "DAN") AND subt.exact("evidence based practice" OR "intervention" OR "school based intervention" OR "schools" OR "teaching methods" OR "teaching" OR "elementary school students" OR "information dissemination" OR "knowledge transfer" OR "educational programs" OR "middle school students") AND pd(20050101-20161231)) AND subt.exact(("evidence based practice" OR "intervention" OR "school based intervention" OR "schools" OR "teaching methods" OR "teaching" OR "elementary school students" OR "academic achievement" OR "information dissemination" OR "knowledge transfer" OR "educational programs" OR "middle school students" OR "special education" OR "experimentation" OR "high school students" OR "teachers" OR "students" OR "curriculum" OR "decision making" OR "program evaluation" OR "classrooms" OR "early intervention" OR "best practices" OR "learning" OR "policy making" OR "program

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development" OR "innovation"))

PsycINFO, narrow 1, 29 February 2016

((effective program implementation) AND (school OR grade) AND yr(2005-2016))

PsycINFO, narrow 2, 29 February 2016

((elementary school teachers) AND (program implementation)) AND yr(2005-2016))

ERIC

ERIC broad search, 27 January 2016

((''Evidence-based practice*'' OR ''Knowledge dissemination*'' OR ''Knowledge transfer*'' OR ''Knowledge mobilization'' OR ''Knowledge mobilisation'' OR ''use of research evidence'' OR ''Knowledge Exchange'' OR ''Information Utilization'' OR ''information utilisation'' OR ''Information Dissemination'' OR ''Information Transfer'' OR ''Knowledge Communication'' OR ''Research engaged'' OR ''research informed'' OR ''research in practice'' OR ''evidence-based teaching'' OR ''evidence-informed teaching'' OR ''research-based teaching'' OR ''research-informed teaching'' OR ''knowledge acquisition'' OR ''research use'' OR ''knowledge use'' OR ''research utilization'' OR ''research utilisation'' OR ''scale up'' OR ''replication'' OR ''proven programs'' OR ''diffusion'') AND pd(>20030101))

ERIC narrow 1, 29 February 2016

(effective program implementation) AND (school OR grade) AND yr(2005-2016))

ERIC, narrow 2, 29 February 2016

(SU.exact(''ELEMENTARY SCHOOL TEACHERS'') AND (SU.exact(''PROGRAM IMPLE-MENTATION'') OR SU.exact(''PROGRAM IMPLEMENTATION 04861''))) AND yr(2005-2016)

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AEI

AEI broad search, 29 February 2016

"Evidence-based practice*" OR "knowledge dissemination'" OR "Knowledge transfer*" OR "Knowledge mobilization" OR "Knowledge mobilisation" OR "Use of research evidence" OR "Knowledge Exchange" OR "Information utilization" OR "Information utilisation" OR "information dissemination" OR "Information transfer" OR "Knowledge communication" OR "research engaged" OR "research informed" OR "research in practice" OR "Evidence-based teaching" OR "Evidence-informed teaching" OR "Research-based teaching" OR "research-informed teaching" OR "knowledge acquisition" OR "research use" OR "knowledge use" OR "research utilisation" OR "research utilization" OR "scale up" OR "replication" OR "proven programs" OR "diffusion" AND pd(>20050101)

AEI narrow, 29 February 2016

SU.EXACT("Program implementation") AND (school OR grade) AND yr(2005-2016)

AEI narrow 2, 29 February 2016

(effective program implementation) AND (school OR grade) AND yr(2005-2016)

BEI

BEI broad search, 25 February 2016

"Evidence-based practice*" OR "knowledge dissemination*" OR "knowledge transfer*" OR "Knowledge mobilisation" OR "knowledge mobilization" OR "use of research evidence" OR "knowledge exchange" OR "information utilisation" OR "information utilization" OR "information dissemination" OR "information transfer" OR "knowledge communication" OR "research engaged" OR "research informed" OR "research in practice" OR "evidence-based teaching" OR "evidence-informed teaching" OR "research-based teaching" OR "research-informed teaching" OR "knowledge acquisition" OR "research use" OR "knowledge use" OR "research utilisation" OR "research utilization" OR "scale up" OR "replication" OR "proven programs" OR "diffusion"

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BEI narrow search, 1 March 2016

("Program implementation") AND (school OR grade)

BREI narrow search 2, 1 March 2016

((effective program implementation) AND (school OR grade))

Web of Science

WoS broad search, 1 February 2016

("Evidence-based practice" OR "knowledge dissemination" OR "knowledge mobilisation" OR "knowledge trans*" OR "Knowledge mobilization" OR "use of research evidence" OR "knowledge exchange" OR "information utilization" OR "Information utilisation" OR "Information dissemination" OR "Information trans*" OR "research use" OR "knowledge use" OR "research utilisation" OR "research utilization" OR "research engaged" OR "research informed" OR "research in practice" OR "evidence-based teaching" OR "evidence-informed teaching" OR "research-based teaching" OR "research-informed teaching" OR "knowledge acquisition" OR "scale up" OR "replication" OR "proven programs" OR "diffusion")

WoS narrow search, 29 February 2016

((Program implementation) AND (school OR grade))

WoS narrow 2 search, 29 February 2016

((effective program implementation) AND (school OR grade))

Forskningsdatabasen, 2 March 2016

(Implementering AND grundskole) ((program implement*) AND school OR grade)

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SwePub

SwePub, 2 March 2016

grundskolelärar* AND implement*

implementering AND skola

implement* AND grundskola

Program implementation AND school OR grade

Implement*

In addition to searches in the above-mentioned databases, the following Scandinavian sites were hand-searched:

Norway:

Atferdssenteret

Læringsmiljøsentret

VOX

UiS

UiO

Kunnskapssenter for utdanning (search: implementation, implemented, implementing)

HiB

UiB

NIFU

NOVA (HiOA) (search: Skole)

Sweden:

SWERA

Umeå Universitet

Skolporten

Skolverket

Skolfi

Karlstad University

Stockholm Universitet

Göteborg Universitet

Högskolen I Malmö

Denmark:

EVA

SFI

KORA

Evidensbasen

Forskningsbasen.dk

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DPU

RUC

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Inclusion/exclusion criteria

Inclusion criteria
Studies are included in this systematic review if they investigate what enables and/or hinders the implementation of research-based knowledge and knowledge implementation in primary and lower secondary school, and do not fall into the categories of the exclusion criteria.

Exclusion criteria
Studies were excluded from the research mapping if they fell into any of the following criteria categories:

Wrong scope: The study does not examine what promotes and/or hinders the implementation of research-based knowledge and knowledge implementation in primary and lower secondary school.

Wrong publication: Publication does not include empirical research data, for example, non-empirical textbooks, editorials, commentaries, book reviews, policy documents, guides, manuals, bibliographies, discussion papers, theoretical papers, research methodology papers.

Wrong educational context: Studies that examine research-based knowledge or knowledge implementation outside primary and lower secondary education.

Wrong time of publication: References published before 1 January 2011.

Wrong context: Research does not offer data from EU member states, Switzerland, Norway, the United States, Canada, Australia, or New Zealand.

Wrong language: Research not published in English, Danish, Swedish, or Norwegian.

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